Fire Protection Evaluation Report

Limerick Generating Station

Units 1 & 2

PHILADELPHIA ELECTRIC COMPANY

8103190570

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CHAPTER 1

INTRODUCTION

On September 30, 1976, the Director of the Division of Project Management, of the Office of Nuclear Reactor Regulation, requested a re-evaluation of the fire protection program for the Limerick Generating Station. Attached to that document was Appendix A to Branch Technical Position ASB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976". The following report was prepared in response to that request and discusses the fire protection program as it relates to nuclear safety and addresses our conformance to Appendix A to Branch Technical Position ASB 9.5-1.

It is the philosophy of Philadelphia Electric Co. (PECo) that fire protection be provided for all company facilities to minimize the effects of a fire. Therefore, proper fire protection was an original design objective for the Limerick Generating Station. Responsibility for the fire protection program is vested in PECo managerial personnel in the same manner as other operating and design responsibilities. To support these responsibilities, PECo employs qualified fire protection personnel to ensure an adequate fire protection program is provided.

Bechtel Power Corporation provided the fire protection engineers and consultants to develop the design concept, preparation of specifications, and selection of experienced fire protection contractors. Bechtel has designed the fire protection systems for several operating nuclear plants and has a specialized staff that monitors the latest in fire protection methods.

The term "fire protection system" refers to the integrated complex of components and equipment provided for detection and suppression of fires. In addition to this system, the "fire protection program" includes the concepts of design and layout implemented to prevent or mitigate fires, administrative controls and procedures, and personnel training. The fire protection program uses a defense-in-depth approach aimed at preventing fires, minimizing the effect of any fires that occur, providing appropriate fire detection and suppression equipment, and training personnel in fire prevention and fire fighting.

The Limerick Generating Station has been evaluated with regard to fire protection to verify that the total fire protection program provides reasonable assurance that a fire will not prevent the performance of necessary safe shutdown functions and will not cause an undue risk to the health and safety of the public. Chapter 2 of this report provides a general description of the fire detection and suppression systems provided for the Limerick Generating Station. Chapter 3 presents a point-by-point comparison of the LGS fire protection program with the guidelines set forth in Appendix A to Branch Technical Position ASB 9.5-1. Chapter 4 provides an evaluation of the combustible loadings in the plant and the ability of specific fire barriers to withstand postulated fires. Chapter 5 provides an evaluation of the ability to safely shut the plant down in the event of a fire in any fire area.

CHAPTER 2

FIRE PROTECTION SYSTEM DESCRIPTION

This section provides a description of the fire suppression and fire detection systems. The specific guidelines contained in Appendix A of Branch Technical Position ASB 9.5-1 are addressed in Chapter 3.

Figure B-1 shows the legend and symbols for P&IDs. The P&ID for the fire protection system is shown in Figure B-2.

2.1 FIRE PROTECTION WATER SUPPLY SYSTEMS

2.1.1 Water Source

The source of water for the fire protection system is two cooling tower basins which have a capacity of 7,200,000 gallons each, for a total capacity of 14,400,000 gallons. For a system pumping capacity of 5000 gpm, this allows continuous operation of both fire pumps for 48 hours. If one cooling tower basin or supply line is not available, the remaining water source provides both fire pumps with a 24-hour supply of water. Water for the fire pumps is taken from either Unit 1 or Unit 2 cooling tower water basins through connections to the circulating water lines. Check valves are installed at the pump discharges to prevent water from one source from being pumped into the other source.

2.1.2 Pumps

There are two horizontal centrifugal-type fire pumps, each rated for 2500 gpm at 125 psig total head. The lead pump is electric motor-driven and the 100% capacity backup pump is diesel engine-driven. The pumps and their controllers are UL-listed.

The fire water system is sufficient to maintain a pressure of 65 psig with a flow of 500 gpm at the highest elevation of each standpipe. When the fire pumps are not running, the standpipes are maintained full of water by a 2-inch connection to the service water system which is capable of replenishing 50 gpm for leakage. When a portion of the fire water system is activated, a low pressure switch set at 100 psig starts the motor-driven pump automatically. If the motor-driven pump fails to start, the diesel-driven pump starts upon a lower pressure signal setpoint of 95 psig. Both pumps are stopped manually.

The electric power for the motor-driven fire pump is taken from a load center that is supplied from the non-Class IE 13-kV switchgear. The primary power source for the switchgear is the unit auxiliary transformer, and the secondary power source is the offsite power supplies. If the primary power source fails, the switchgear is automatically transferred to one of the two offsite power supplies. Switching from one offsite power supply to the other can be performed manually from the control room.

The diesel oil supply tank for the diesel engine has a capacity of 550 gallons. This volume is sufficient to allow operation of the diesel engine for approximately 40 hours at full pump capacity.

The fire pumps are located at one end of the circulating water pump structure north of the power block. The motor-driven fire pump and its controls are in an area common with the circulating water pumps and are protected by hose reels and portable fire extinguishers. The diesel-driven fire pump and controls are in a separate compartment whose floor, ceiling, walls, and door are rated as 3-hour fire barriers. The diesel oil day tank is located in a curbed area within the diesel-driven fire pump compartment. This compartment is provided with an automatic sprinkler system.

2.1.3 Yard Piping

Fire protection water is distributed to the various areas of the plant from a yard fire main loop which completely encircles the power block. The connections to the yard fire main loop from the two fire pumps located in the circulating water pump structure are spaced about 6 feet apart and are provided with valving so that either connection can be isolated while retaining 100% water supply capacity to the yard fire main. The routing of the yard fire main loop and its branch piping is shown on Figure A-3.

The yard fire main loop consists of 12-inch cement-lined cast iron piping which is buried below the frost line. The west and east ends of the loop are cross-connected by piping which traverses the Unit 1 and Unit 2 turbine enclosures. Locked-open post indicator valves provide sectionalized control and isolation of portions of the fire main loop. There are 12 yard hydrants spaced at intervals of 250 to 300 feet along the fire main loop. Each hydrant is provided with a key-operated 6-inch gate valve with a curb box. Five hose cart houses are located in the yard area in the vicinity of the hydrants, each enclosing a hose cart which can be manually moved to any hydrant where it is needed. The system of hydrants connected to the fire main loop is designed in accordance with NFPA 24.

2.2 WET PIPE SPRINKLER SYSTEMS

Wet pipe sprinkler systems are provided to protect the following areas and equipment:

a. Turbine enclosure - feedwater pump lube oil reservoir compartments

b. Turbine enclosure - lube oil storage tanks and electro-hydraulic control power unit

c. Turbine enclosure - main turbine lube oil reservoir and lube oil centrifuge area

d. Turbine enclosure - main turbine condenser area

e. Turbine enclosure - main turbine moisture separator area

f. Reactor enclosure - electric cable penetration areas at elevations 253 and 283 feet

g. Radwaste enclosure compactor area

h. Lube oil storage enclosure

i. Auxiliary boiler enclosure

j. Warehouse, machine shop, and construction shop

k. Circulating water pump structure - diesel fire pump compartment.

l. Administration building - offices and engineering lab

Each wet pipe sprinkler system consists of an outside screw and yoke (OS&Y) gate valve, an alarm check valve assembly, piping, and fusible element sprinkler heads.

Wet pipe sprinkler system operation is initiated when ambient temperature rises to the melting point of fusible links on sealed sprinkler heads, thus causing the spray heads to open. The flow of water through alarm check valves energizes a flow switch which transmits the alarm condition to the fire protection panels in the control room.

The wet pipe sprinkler system operation is terminated manually by shutting the OS&Y gate valve.

2.3 PRE-ACTION SPRINKLER SYSTEMS

Pre-action sprinkler systems are provided to protect the following areas and equipment:

a. Reactor enclosure - HPCI pump compartment

b. Reactor enclosure - RCIC pump compartment

c. Standby diesel-generator compartments

d. Turbine enclosure - railroad access area

e. Turbine enclosure - generator equipment area

f. Turbine enclosure - under the turbine's appearance lagging and turbine bearing housings 1 through 9

g. Turbine enclosure - reactor recirculation pump motor-generator set.

Each pre-action sprinkler system is automatically actuated by a rate-compensated heat detector. The temperature sensor releases a tripping device to open the deluge valve, thus supplying water under pressure to the closed sprinkler heads. A rise in ambient temperature to the melting point of the fusible links on the sealed sprinkler heads causes the spray heads to open, with subsequent water flow through those heads which have opened. Actuation of the temperature responsive device also initiates a local alarm, and registers an alarm condition on the fire protection panels in the control room.

The dry-pipe system from the air check valve to the sprinkler heads is pressurized with instrument air. On loss of air pressure, a low pressure switch energizes a local alarm and registers an alarm condition in the control room. Both deluge valve operation and loss of pressure in the sprinkler system are separately annunciated in the control room. High or low air supply pressure downstream of the pressure regulator to the dry-pipe system is annunciated in the control room.

2.4 DELUGE SYSTEMS

Deluge systems are provided to protect the following areas and equipment:

a. Main transformers, auxiliary transformers, and safeguard transformers (all located outdoors)

b. Generator hydrogen seal oil unit

c. Main turbine lube oil reservoir and lube oil centrifuge.

Operation of a deluge sprinkler system is initiated by a fixed temperature detector. This sensor detects a fixed high temperature and releases a tripping device to open the deluge valve, thus supplying water under pressure to the open spray heads. Actuation of the temperature responsive device also initiates a local alarm, and registers the alarm condition on the fire protection panels in the control room, independently of water flow in the system. Manual release of the deluge valve tripping device, or actuation by the local hand switch, also initiates local and remote alarms.

2.5 WATER SPRAY FOR CHARCOAL FILTERS

Charcoal filters in the ventilation systems of the plant are provided with water spray systems for fire protection. The water is supplied to the filters by means of a fixed piping system.

An indicating gate valve is manually opened when a heat detector actuates a local alarm system and registers an alarm condition on the fire protection panels in the control room. The operation is terminated manually by shutting the gate valve.

2.6 WET STANDPIPES AND HOSE STATIONS

Wet standpipes are designed for Class III service in accordance with NFPA 14. All areas in the power block are within reach of at least one effective hose stream. Each hose station has 100 feet of 1-1/2 inch woven, jacket-lined fire hose. Hose stations are located outside entrances to normally unoccupied areas, and outside both entrances of the control room. Adjustable fog and straight-stream nozzles are provided for all hose reels.

2.7 FOAM EXTINGUISHING SYSTEM

A foam system is provided for the protection of the fuel oil transfer structure and two outdoor fuel oil storage tanks, and is designed in accordance with NFPA 11. The foam is educted from a foam solution tank by water from the main fire water header. Contacts are provided to annunciate operation of the system in the control room.

The two storage tanks are each provided with a fixed foam maker at the tank. Foam making is initiated manually from a local station after a high temperature condition at one of the tanks has been alarmed locally and annunciated on the fire protection panels in the control room. Fire protection inside the fuel oil transfer structure is provided by a foam playpipe with hose rack. When the playpipe is removed from its holder, an electric switch located in the holder actuates a control valve to allow foam solution to enter the hose. A squeeze-type playpipe valve enables the operator to control the flow of foam.

2.8 LOW PRESSURE CARBON DIOXIDE SYSTEM

The low pressure CO_2 system is designed in accordance with NFPA 12. In addition to the total flooding CO_2 system provided for the cable spreading rooms, CO_2 fire protection is provided by CO_2 hose reels in the 13.2 kV switchgear compartment, outside both entrances to the control room, and along the north side of the turbine enclosure operating deck.

The design discharge rate of the total flooding CO_2 system in the cable spreading room is based on reaching a 50% concentration within 7 minutes. The storage tank has sufficient capacity to maintain a 50% concentration in both the Unit 1 and Unit 2 cable spreading rooms simultaneously for a period of 1 hour, while leaving a reserve in the tank for hose reel operation.

The total flooding CO_2 system provided for the cable spreading room is actuated by heat detectors. A predischarge alarm sounds locally and in the control room. HVAC system penetrations into the area are sealed off by steam isolation dampers which close automatically when the CO_2 system is actuated.

CO_2 hose reels are activated by removing a playpipe from its holder. An electric switch, located in the playpipe holder, actuates a control valve to allow CO_2 into the hose. A squeeze-type playpipe valve enables the operator to control the flow of the CO_2 discharge.

2.9 HALON EXTINGUISHING SYSTEMS

Two separate Halon extinguishing systems are provided in the auxiliary equipment room. One system serves the Unit 1 side of the room and the second system serves the Unit 2 side of the room. Each system discharges simultaneously into all floor sections in its respective half of the auxiliary equipment room.

The flooring in the auxiliary equipment room consists of 1-foot high floor sections resting on the concrete slab at elevation 283 feet. The floor sections are of all-steel construction and are used for the routing of cabling to and from the electrical equipment located in the room. This equipment includes the power generation control complex (PGCC) equipment, the plant computers, the remote shutdown panels, the Samac panels, a tone cabinet, an oscillograph, and possibly three panels of vibration and loose parts monitoring equipment. The PGCC for each unit consists of ten floor sections that are 8 feet wide and 20 feet long, each of which has vertical panels mounted near the center of the floor section. A termination cabinet is located at the end of each PGCC floor section. Smoke and fire detectors are located in the termination cabinets.

Each Halon extinguishing system consists of a pair of cylinders (pressurized with dry nitrogen) containing liquified Halon 1301 at ambient temperature, plus distribution piping, spray nozzles, a control panel, a manual actuation switch, heat detectors, and product-of-combustion (ionization) detectors. The product-of-combustion detectors actuate early warning alarms both locally and in the control room. The heat detectors actuate pre-discharge alarms followed by discharge of the Halon after a time delay. The Halon extinguishing systems are designed in accordance with NFPA 12A.

Each Halon system is designed to achieve a concentration of 20% by volume within the raised flooring that it serves, with a concentration of 6% by volume being reached within 10 seconds after discharge begins. The first Halon cylinder is discharged automatically and has sufficient capacity to maintain the 20% concentration for 20 minutes. The remaining Halon cylinder, which is manually discharged, provides a 100% reserve capacity.

2.10 PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers, using extinguishing agents compatible with the combustible material in the area in which they are located, are provided throughout the plant.

2.11 FIRE AND SMOKE DETECTION SYSTEM

The fire and smoke detection system is in compliance with NFPA 72A. The system also complies with the requirements of NFPA 72D for a Class B system with the following exceptions:

a. No device is provided for permanently recording incoming signals with the date and time of receipt.

b. Operation and supervision of the system is not the primary function of the operators.

c. In lieu of complete reliance on NFPA 72E, smoke and fire detector locations are established by a qualified fire protection engineer.

Fire and smoke monitoring, detection, and alarm are accomplished by installing smoke detectors and/or heat-responsive detectors in areas where fire potential exists. Fire and smoke detection systems for annunciation are separate from fire detection systems for actuation of fire extinguishing systems.

The fire and smoke detection system is electrically supervised to detect circuit breaks, ground faults, and power failure. All fire or trouble alarms register on the audible-visual annunciator on the fire protection panels in the control room.

CHAPTER 3

COMPARISON TO APPENDIX A OF NRC BRANCH TECHNICAL POSITION ASB 9.5-1

The purpose of this chapter is to compare the fire protection provisions of Limerick Generating Station (LGS) Units 1 and 2 with the guidelines in Appendix A to Branch Technical Position ASB 9.5-1.

To identify areas of potential impact and to facilitate comparison, a matrix addressing each guideline of Appendix A and relating to the plant systems, equipment, and components, is included as Section 3.1. The matrix has extracted all suggested guidelines from Appendix A and given each an item number 1 through 210. Each item has condensed a particular guideline and makes reference to the page and paragraph in Appendix A where that guideline can be found. The general degree of conformance to the guideline is indicated in the "comparison" column, using codes defined as follows:

- C - indicates conformance to the guideline or conformance to its intent. Substantiating statements are included as part of the matrix or the manner of conformance is discussed in Section 3.2.
- AC - indicates conformance to the guidelines by alternate means or methods. The manner of conformance is included in the matrix or discussed in Section 3.2.
- WC - indicates that design changes, means, or methods are planned in order to conform, or conform to the intent of the guideline. The planned design changes, means, or methods and the manner of conformance are discussed in Section 3.2.
- NC - indicates that the plant is not in conformance and no design changes are planned. The basis for non-conformance to the guideline is included in the matrix or discussed in Section 3.2.
- NA - indicates that the guideline is not applicable to Limerick Generating Station Units 1 and 2. Substantiating statements are included as part of the matrix in Section 3.1.

In the "remarks" column, additional information is provided to explain or expand on the degree of conformance. Alternatively, reference may be made to Section 3.2 (or other sections in this report) for a more detailed discussicn. The item numbers in Section 3.2 correspond to those in Section 3.1.

SECTION 3.1

DETAILED COMPARISON TO
APPENDIX A OF BRANCH TECHNICAL POSITION ASB 9.5-1

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
	Overall Requirements of Nuclear Plant Fire Protection Program				
1.	Management responsibility for fire protect on program and delegation c authority.	1	A.1	WC	See note 1
2.	Qualification requirements for fire protection engineers.	1	A.1	WC	Qualified fire protection engineers of the Bechtel Power Corporation provided assistance in the development of the design and equipment specification for the fire protection system.
3.	Training of the fire fighting and operating crew.	1	A.1	WC	See note 1
4.	Responsibilities of the fire protection staff.	1	A.1	WC	See note 1
5.	The fire protection program should be based on evaluation of potential fire hazards and the effect of postulated fires on safety-related systems and radioactivity releases.	2	A.2	C	See Chapters 4 and 5
6.	Backup fire suppression capability should be provided.	2	A.3	C	All automatic fire suppression systems are backed up by two methods of manual extinguishment (hose stations and portable extinguishers).
7.	Primary and backup fire suppression capability should satisfy the single failure criterion.	2	A.4	C	See Section 3.2
8.	Effects of lightning strikes should be included in the fire protection program.	3	A.4	C	Lightning protection is provided per NFPA No. 78.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION		COMPARISON	REMARKS
		Page	Item		
9.	Failure or inadvertent operation of fire suppression systems should not incapacitate safety-related systems.	3	A.5	NC	See Section 3.2
10.	Fire suppression systems that are pressurized during normal plant operation should meet the guidelines specified in BTP APCSB 3-1.	3	A.5	C	Moderate-energy leakage cracks in fire suppression system piping are analyzed in accordance with BTP APCSB 3-1.
11.	The fire protection program for new fuel areas should be fully operational before fuel is received at the site.	3	A.6	C	The fire protection program for the new fuel area will be completed and fully operational before fuel is received at the site.
12.	The fire protection program should be fully operational prior to initial fuel loading.	4	A.7	C	The fire protection program for each reactor unit will be completed and fully operational prior to initial fuel loading.
13.	Multiple reactor unit site fire protection program.	4	A.8	WC	See Section 3.2
14.	Simultaneous fires in more than one reactor unit need not be postulated.	4	A.9	C	See Section 3.2
	Administrative Procedures, Controls, and Fire Brigade				
15.	Provision of administrative procedures.	4	B.1	WC	See note 1
16.	Administrative measures for combustible material storage.	5	B.2	WC	See note 1
17.	Management control of normal and abnormal conditions and modification work to assure adequate fire protection.	5	B.3	WC	See note 1
18.	Ignition sources: procedure review and approval, training and equipping, fire watch.	5	B.3.a	WC	See note 1
19.	Leak testing should use aerosol techniques rather than open flames or combustion generated smoke.	6	B.3.b	WC	See note 1

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
20.	Combustible material usage: control and minimization in safety-related areas.	6	B.3.c	WC	See note 1
21.	The plant should be self-sufficient with respect to fire fighting activities, and rely on public fire department only for backup.	6	B.4	WC	See note 1
22.	Fire brigades: organization, training, and equipping.	7	B.5	WC	See note 1
23.	Testing and maintenance of fire protection program.	7	B.5.a	WC	See note 1
24.	Training of fire brigade; drills quarterly and with local fire department at least annually.	8	B.5.b	WC	See note 1
25.	Training of all shift members; coordination with and training of local fire department personnel.	8	B.5.c	WC	See note 1
26.	Standards for guidance: NFPA 27, 194, 196, 197, 601, and others.	9	B.5.d	WC	See note 1
	Quality Assurance Program				
27.	QA programs of applicants and contractors to assure proper control for the fire protection program for safety related areas; program under management control of the QA organization.	10	C	AC/WC	See Section 3.2
	General Guidelines for Plant Protection				
28.	Plant layout should be arranged to isolate safety-related systems from unacceptable fire hazards.	12	D.1.a.1	C	Safety-related systems are located in fire areas separate from those containing major fire hazards.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION		COMPARISON	REMARKS
		Page	Item		
29.	Plant layout should be arranged to separate redundant safety-related systems from each other.	12	D.1.a.2	NC	See Section 3.2
30.	Identification of safety-related systems and fire hazards.	13	D.1.b	C	See Section 3.2
31.	Cable spreading rooms should not be shared between multiple reactor units.	13	D.1.c	C	Cable spreading rooms are not shared between reator units.
32.	The cable spreading room should be separated from other areas of the plant by 3-hour fire barriers.	13	D.1.c	C	Cable spreading room is separated from other plant areas by 3-hour barriers.
33.	Redundant cabling in cable spreading room should be separated by 3-hour barriers.	13	D.1.c	NC	Cabling associated with redundant safety-related systems is routed in separate raceways which are separated in accordance with Regulatory Guide 1.75.
34.	Interior wall and structural components, thermal insulation, soundproofing, and radiation shielding materials should be noncombustible.	13	D.1.d	C	See Section 3.2
35.	Interior finishes should be noncombustible or listed by a testing laboratory for flame spread, smoke, and fuel contribution of 25 or less.	13	D.1.d	C	See Section 3.2
36.	Metal deck roof construction should be noncombustible or listed as Class I by Factory Mutual System Approval Guide.	13	D.1.e	AC	See Section 3.2
37.	Suspended ceilings and supports should be noncombustible.	14	D.1.f	C	The suspended ceiling in the control room is of noncombustible construction, consisting of mineral fiber panels resting on a metal grid system which is supported by steel wires.
38.	Concealed spaces should be devoid of combustibles.	14	D.1.f	NC	See Section 3.2

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION		COMPARISON	REMARKS
		Page	Item		
39.	High voltage - high amperage transformers in buildings containing safety-related systems should be dry or cooled with noncombustible liquid.	14	D.1.g	C	All indoor transformers are air cooled, dry type, or cooled by noncombustible fluids.
40.	Protection of buildings containing safety-related systems from exposure or spill fires involving oil-filled transformer.	14	D.1.h	C	All outdoor oil-filled transformers are located more than 50 feet from any safety-related structure.
41.	Floor drains sized for expected fire fighting water flow should be provided for areas with fixed suppression systems.	15	D.1.i	C	Adequate floor drainage is provided in all plant areas provided with fixed water fire suppression systems.
42.	Floor drains should be provided where needed to prevent fire hose water from causing unacceptable damage to equipment.	15	D.1.i	NC	See Section 3.2
43.	Equipment should be mounted on pedestals, or curbs should be provided to contain and direct water to floor drains.	15	D.1.i	C	Floor-mounted safety-related components are raised above floor level either by the use of an extended frame base or by mounting on a pedestal.
44.	Drains in areas containing combustible liquids should have provisions for preventing the spread of fire throughout the drain system.	15	D.1.i	C	See Section 3.2
45.	Water drainage from areas which may contain radioactivity should be sampled and analyzed before discharge to environment.	15	D.1.i	C	Potentially radioactive liquid wastes are collected and monitored prior to discharge.
46.	Floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours.	15	D.1.j	NC	See Section 3.2
47.	Doors in barriers separating fire areas should be 3-hour rated.	15	D.1.j	AC	See Section 3.2

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
48.	Doors in barriers separating fire areas should be normally closed and locked, or provided with annunciation in the control room.	15	D.1.j	NC	See Section 3.2
49.	Ventilation system penetrations in barriers separating fire areas should be protected by a standard "fire door damper" where required.	16	D.1.j	C	Fire dampers or fire doors, compatible with the fire barrier, are installed at all ventilation duct penetrations through fire barriers.
	Control of Combustibles				
50.	Safety-related systems should be separated from combustible materials where possible and when not, special protection should be provided to prevent a fire from defeating the safety system function.	16	D.2.a	C	To the maximum extent possible, significant concentrations of combustible materials are located outside structures containing safety-related components. In those cases for which this is not possible, such as the standby diesel-generator fuel oil day tanks, special fire protection consisting of automatic fire suppression systems and/or construction capable of withstanding a fire is provided.
51.	Bulk gas storage (compressed or cryogenic) should not be permitted inside structures housing safety-related equipment. Flammable gases should be stored outdoors or in separate detached buildings.	16	D.2.b	NC	See Section 3.2
52.	High pressure gas storage containers should be located with the long axis parallel to building walls.	17	D.2.b	C	High pressure gas storage cylinders are stored vertically.
53.	Use of compressed gases inside buildings should be controlled.	17	D.2.b	WC	See Section 3.2

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
54.	Plastic material usage should be minimized. Halogenated plastics such as PVC and neoprene should be used only when substitute non-combustible materials are not available.	17	D.2.c	C	See Section 3.2
55.	Storage of flammable liquids should comply with NFPA 30.	17	D.2.d	C	Liquid fuels are stored either in aboveground tanks that have been provided with suitable fire barriers or in underground tanks.
	Electrical Cable Construction, Cable Trays and Penetrations				
56.	Only noncombustible materials should be used for cable tray construction.	18	D.3.a	C	Aluminum cable trays are used.
57.	Cable spreading rooms fire protection guidelines.	18	D.3.b	-	See items 138 through 151
58.	Automatic water sprinkler systems should be provided for cable trays outside the cable spreading room.	18	D.3.c	NC	See Section 3.2
59.	Cables should be designed to allow wetting down without electrical faulting.	18	D.3.c	C	Cable insulating systems include proprietary jacketing materials designed for wetting.
60.	Cable trays should have manual hoses and portable extinguishers provided as backup to automatic sprinklers.	18	D.3.c	AC	See Section 3.2
61.	Safety-related equipment in in vicinity of cable trays should be protected from sprinkler system operation or malfunction.	18	D.3.c	C	See Section 3.2

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
62.	Cable and cable tray penetration of fire barriers should be sealed to give protection equivalent to that of the fire barrier. The design of fire barriers for cable trays should meet the requirements of ASTM E-119.	18	D.3.d	WC	See Section 3.2
63.	Fire breaks should be provided as deemed necessary by fire hazards analysis. Flame or fire retardant coatings may be used as a fire break for grouped electrical cables.	18	D.3.e	C	See Section 3.2
64.	Electrical cable construction should pass the IEEE 383 flame test.	19	D.3.f	AC	See Section 3.2
65.	To the extent practical, cable construction that does not give off corrosive gases while burning should be used.	19	D.3.g	C	See Section 3.2
66.	Cable trays, raceways, conduit, trenches, or culverts should be used only for cables. Miscellaneous storage should not be permitted, nor should piping for flammable or combustible liquids or gases be installed in cable routing area.	19	D.3.h	C	Electrical cable raceways are used only for cables.
67.	The design of cable tunnels, culverts, and spreading rooms should provide for automatic or manual smoke venting as required to facilitate manual fire fighting.	19	D.3.i	AC	Building ventilation systems are capable of being manually controlled to effect smoke removal in safety-related areas with cable concentrations.
68.	Cables in the control room should be kept to the minimum necessary number. All cables entering the control room should terminate there.	19	D.3.j	C	Cables entering the control room are essential to the operation of the control room and terminate within the control room.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
69.	Cables should not be installed in trenches or culverts in the control room.	19	D.3.j	C	See Section 3.2
	Ventilation				
70.	Smoke and corrosive gases in specific fire areas - evaluation and control; discharge to outside.	20	D.4.a	AC	See Section 3.2
71.	Ventilation systems exhausting smoke or corrosive gases should be evaluated to assure single failure or inadvertent operation does not violate controlled areas of the plant design.	20	D.4.b	AC	See Section 3.2
72.	Power supply and controls for ventilation systems should be run outside the fire area served by the system.	20	D.4.c.	AC	See Section 3.2
73.	Fire suppression systems should be installed to protect charcoal filters in accordance with Regulatory Guide 1.52.	20	D.4.d	AC	See Section 3.2
74.	Air intakes for ventilating systems serving areas containing safety-related systems should be remote from exhaust and smoke outlets of other fire areas.	20	D.4.e	C	Air intakes serving areas which contain safety-related systems are remote from exhaust and smoke outlets of other fire areas.
75.	Design and use of stairwells and elevators.	21	D.4.f	AC	See Section 3.2
76.	Smoke and heat vents; minimum ratios for natural convection and forced convection.	21	D.4.g	AC	See Section 3.2
77.	Requirements for breathing apparatus for fire brigade, damage control, and control room personnel.	21	D.4.h	WC	See Section 3.2

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
78.	For total flooding gas extinguishing systems, area intake and exhaust ventilation dampers should close upon initiation of gas flow.	22	D.4.i.	C	Initiation of the carbon dioxide total flooding system for the cable spreading room actuates pressure switches which initiate isolation of the steam flooding dampers in the ventilation ducts penetrating the cable spreading room walls.
	Lighting and Communication				
79.	Fixed emergency lighting should consist of sealed beam units with individual 8-hour minimum battery power supplies.	22	D.5.a	NC	See Section 3.2
80.	Sealed beam battery-powered portable hand lights should be provided for emergency use.	23	D.5.b	WC	Portable lights will be provided.
81.	Fixed emergency communication should use voice powered head sets at preselected stations.	23	D.5.c	NC	See Section 3.2
82.	Fixed repeaters for portable radio communication units should be protected from fire damage.	23	D.5.d	NA	See Section 3.2
	Fire Detection and Suppression				
	Fire Detection				
83.	Fire detection compliance with NFPA 72D.	23	E.1.a	NC	See Section 3.2
84.	Fire detection system should give audible and visual alarm and annunciation in the control room.	23	E.1.b	C	Fire and smoke detection signals are annunciated audibly and visually at the fire protection panel in the control room.
85.	Local audible alarms should also sound at the location of the fire.	23	E.1.b	AC	Local annunciators near the critical hazards sound audible alarms.
86.	Fire alarms should be distinctive and unique.	23	E.1.c	C	Audible fire alarms are unique and distinct from other plant alarms.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
87.	Fire detection and actuation systems should be connected to the plant emergency power supply.	23	E.1.d	C	See Section 3.2
	Fire Protection Water Supply Systems				
88.	An underground yard fire main loop should be installed furnish anticipated fire water requirements; use of NFPA 24.	23	E.2.a	C	The yard fire main has been installed in compliance with NFPA No. 24.
89.	Lined steel or cast iron pipe should be used to reduce turberculation.	24	E.2.a	C	The yard fire main untilizes cement-lined cast iron pipe.
90.	Means for treating and flushing of fire main should be provided.	24	E.2.a	AC	Water used for fire protection service meets the requirements of NFPA No. 22 and does not require treatment. Flushing of the fire main is possible by sectionalized control of the fire main loop.
91.	Approved visually indicating sectional control valves should be provided for isolation of fire main portions during maintenance or repair without shutting off entire system.	24	E.2.a	C	Post indicator valves provide sectionalized control and isolation of portions of the fire main loop.
92.	Fire main system piping separate from service or sanitary water system piping.	24	E.2.a	C	The fire main loop is separate from service water and domestic water system piping.
93.	A common yard fire main loop may loop may serve multi-unit nuclear power plant sites, if cross-connected between units.	24	E.2.b	C	A common fire main loop is provided and cross-connected between units.
94.	Redundant 100% capacity fire pumps.	25	E.2.c	C	Two UL-listed fire pumps are provided, each capable of supplying 100% of the fire water-system flow requirements.
95.	Fire pump connections to the yard fire main should be widely separated.	25	E.2.c	AC	See Section 3.2

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96.	Each pump should have its own driver with independent power supplies and control.	25	E.2.c	C	Each fire pump is provided with individual drive, power source, and controls.
97.	At least one fire pump should be driven by non-electrical means, preferably diesel engine.	25	E.2.c	C	One fire pump is diesel engine-driven.
98.	Fire pumps and drivers should be located in rooms separated from the remaining pumps and equipment by 3-hour fire walls.	25	E.2.c	NC	See Section 3.2
99.	Fire pump alarms indicating pump running, driver availability, or failure to start should be provided in the control room.	25	E.2.c	C	Fire pump availability, running, and trouble alarms are annunciated in the control room.
100.	Fire pump installation should conform to NFPA 20 as a minimum.	25	E.2.c	C	The fire pump installation conforms to the requirements of NFPA 20.
101.	Two separate reliable water supplies should be provided.	25	E.2.d	C	Fire protection water is normally supplied from two cooling tower basins.
102.	Requirements for tanks used to supply fire protection water.	25	E.2.d	NA	Tanks are not utilized for fire protection water supply.
10	The fire water supply should be based on the largest expected flow rate for a period of 2 hours (300,000 gallon minimum).	26	E.2.e	C	See Section 3.2
104.	Lakes or fresh water ponds of sufficient size may qualify as sole source of water for fire protection.	26	E.2.f	NA	Two cooling tower basins are utilized for fire protection water supply.
105.	If a common water supply is used for fire protection and ultimate heat sink, then fire water requirements should be included in total storage capacity, and failure of the fire protection system should not degrade the ultimate heat sink.	26	E.2.f	NA	The fire protection system and the ultimate heat sink do not use a common water supply.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
106.	Outside manual hose stations should be able to reach any location approximately every 250 feet on yard main.	27	E.2.g	AC	Hydrants are spaced between 250 and 300 feet apart along the fire main loop.
107.	Yard main laterals to hydrants should be controlled by a visually indicating or key operated (curb) valve.	27	E.2.g	C	Each hydrant is provided with a key-operated gate valve with a curb box.
108.	Hose houses should be equipped as recommended in NFPA 24, and should be provided as needed, but at least every 1000 feet.	27	E.2.g	AC	See Section 3.2
109.	Threads on hydrants, hose couplings, and standpipe risers should be compatible with those used by local fire departments.	27	E.2.g	C	The hose threads are compatible with those of the local fire department.
	<u>Water Springkler and Hose Standpipe Systems</u>				
110.	Each automatic sprinkler and manual hose station standpipe should have an independent connection to the yard main or to headers fed from each end.	27	E.3.a	NC	See Section 3.2
111.	Each sprinkler and standpipe system should be equipped with OS&Y gate valve, or other approved shutoff valve, and water flow alarm.	28	E.3.a	AC	See Section 3.2
112.	Safety-related equipment should be protected from sprinkler discharge if such discharge could result in unacceptable damage to the equipment.	28	E.3.a	AC	See Section 3.2
113.	Fire water system valves should be electrically supervised with indication in the control room and other locations as appropriate.	28	E.3.b	NC	See Section 3.2

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
114.	Automatic sprinkler systems conform to appropriate NFPA standard as a minimum.	28	E.3.c	C	Automatic sprinkler and deluge systems comply with the applicable requirements of NFPA Nos. 13 and 15.
115.	Recommendations for interior manual hose installations.	28	E.3.d	NC	See Section 3.2
116.	Location of hose stations based on whether an area is normally occupied or normally unoccupied; location of shutoff valves and pressure-reducing devices outside safety-related areas.	29	E.3.d	NC	See Section 3.2
117.	Hose nozzle selection should be based on the fire hazard analysis; electrically safe nozzles should be provided in vicinity of electrical hazards.	30	E.3.e	AC	See Section 3.2
118.	Foam fire suppression.	30	E.3.f	AC	See Section 3.2
	Halon Suppression Systems				
119.	Recommendations for Halon suppression systems.	31	E.4	C	See Section 3.2
	Carbon Dioxide Suppression Systems				
120.	Recommendations for carbon dioxide suppression systems.	31	E.5	C	See Section 3.2
	Portable Extinguishers				
121.	Fire extinguishers should be provided in accordance with NFPA 10.	32	E.6	C	Portable extinguishers compatible with the combustible material are provided in accordance with NFPA 10 and the requirements of OSHA.
122.	Dry chemical extinguishers should be installed with due consideration of cleanup problems and possible adverse effects on equipment in area.	32	F.6	WC	Dry chemical extinguishers will be provided as required.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
	Guidelines for Specific Plant Areas				
	Primary and Secondary Containment				
123.	Fire protection requirements should be provided on the basis of specific identified hazards.	32	F.1.a	C	Fire hazards have been identified, as discussed in Chapter 4, and fire suppression systems have been provided accordingly. The types and locations of suppression systems are identified in Table A-1 and Figures B-4 through B-12.
124.	Because of inaccessability of these areas, protection should be provided by automatic fixed systems.	33	F.1.a	NC	See Section 3.2
125.	Operation of the fire protection systems should not compromise integrity of the containment or other safety-related systems.	33	F.1.a	C	The fire protection system does not penetrate the primary containment boundary. Also see item 9.
126.	Fire detection systems should alarm and annunciate in the control room.	33	F.1.a	C	Actuation of the early warning fire detection system, as well as actuation of any automatic fire suppression system, is annunciated on the fire protection panels in the control room. Type and location of fire detectors used is indicated in Table A-1.
127.	A backup fire detection capability should be provided for the primary containment.	33	F.1.a	NC	See Section 3.2
128.	Manual fire fighting capability should be permanently installed in containment.	34	F.1.b	AC	See Section 3.2
129.	Independent self-contained breathing apparatus should be provided near containment entrances.	34	F.1.b	WC	See item 77

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
	Control Room				
130.	The control room should be separated from other areas of the plant by 3-hour fire barriers.	35	F.2	C	See Section 3.2
131.	Recommendations for manual fire fighting capability.	35	F.2	C	See Section 3.2
132.	Fire detection in the control room.	36	F.2	AC	See Section 3.2
133.	Breathing apparatus for control room operators should be readily available.	36	F.2	WC	See item 77
134.	All penetration seals should be airtight.	36	F.2	C	All penetrations in the control room walls, floor, and ceiling will be sealed airtight.
135.	Control room ventilation provisions; smoke detection, automatic isolation, and venting.	36	F.2	AC	See Section 3.2
136.	Cables should not be located in concealed floor and ceiling spaces.	36	F.2	NC	See items 38 and 69
137.	All cables that enter the control room shall terminate in control room	36	F.2	C	Cables entering the control room are essential to the operation of the control room and terminate within the control room.
	Cable Spreading Room				
138.	Use of automatic water or foam extinguishing systems in the cable spreading room.	37	F.3.a.1	AC	See Section 3.2
139.	Manual hoses and portable extinguishers should be provided as backup.	38	F.3.a.2	C	Manual hose stations and portable extinguishers are located outside both entrances to the cable spreading room.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
140.	Each cable spreading room should have divisional cable separation.	38	F.3.a.3	NC	All four divisions of safety-related cabling are routed through the cable spreading room. The raceways through which the different divisions are routed are separated from each other in accordance with Regulatory Guide 1.75.
141.	The cable spreading room should be separated from other areas of plant by a 3-hour rated fire wall.	38	F.3.a.3	C	The cable spreading rooms of the two reactor units are separated from each other and from other plant areas by 3-hour rated fire barriers.
142.	Two remote and separate entrances to the cable spreading room should be provided.	38	F.3.a.4	C	Two remote and separate entrances are provided for access to each cable spreading room.
143.	Aisle separation between tray stacks should be 3 feet wide by 8 high.	38	F.3.a.5	NC	The minimum aisle separation between stacks is approximately 3 feet wide. The minimum clear headroom is approximately 6-1/2 feet high.
144.	Divisional cable separation should meet the guidelines of Regulatory Guide 1.75.	38	F.3.b.1	C	Safety-related cable divisions are located in cable raceways that are separated from each other and from nonsafety-related raceways in accordance with Regulatory Guide 1.75.
145.	Cabling should be covered with a suitable fire retardant coating.	38	F.3.b.2	NC	Although no cables are covered with fire retardant coating, cable insulation systems used pass the IEEE-383 flame test.
146.	Automatic gas systems are acceptable for primary fire suppression if a fixed water system is used as backup	38	F.3.b.3	AC	See item 138.
147.	An auxiliary shutdown system with cabling independent of the cable spreading room should be provided if R.G. 1.75 guidelines are not met.	39	F.3.b.4	C	Even though the guidelines of Regulatory Guide 1.75 are met, each reactor unit is provided with a remote shutdown panel with cabling that is not routed through the cable spreading room.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
148.	For multiple reactor unit sites, cable spreading rooms should not be shared.	39	F.3	C	Each reactor unit is served by a separate cable spreading room.
149.	The ventilation system to the cable spreading room should be designed to isolate the area upon actuation of a gas extinguishing system.	39	F.3	C	In the event of actuation of the CO_2 system in the cable spreading room, ventilation ducts penetrating the boundaries of the room are automatically isolated by steam flooding dampers. The dampers are actuated by pressure switches connected to the CO_2 distribution piping.
150.	Smoke venting of the cable spreading room should be controlled automatically by the fire detection or suppression system.	39	F.3	NC	Automatic smoke venting for areas served by gas extinguishing systems is not recommended and is not needed in the cable spreading room.
151.	Capability for remote manual control of smoke venting should be provided.	39	F.3	AC	See item 76
	Plant Computer Room				
152.	Fire protection recommendations for safety-related computers.	39	F.4	NA	The plant computer is not safety-related.
	Switchgear Rooms				
153.	Switchgear rooms should be separated from the remainder of the plant by 3-hour rated fire barriers to the extent practicable.	40	F.5	NC	The switchgear rooms at El. 239 feet in the control structure are separated from each other by 3-hour rated fire walls. These rooms and the one at El. 217 feet in the control structure are separated from the remaining areas of the plant by 3-hour rated fire walls. The floors and ceilings of the rooms are capable of 3-hour fire ratings with the exception of exposed structural steel supporting the slabs.

NO.	APPENDIX A GUIDELINE	APPENDIX A LOCATION Page	Item	COMPARISON	REMARKS
154.	Automatic fire detection should alarm locally and in the control room	40	F.5	C	Each emergency switchgear room is provided with heat and ionization smoke detectors with local and control room alarm and annunciation.
155.	Hose stations and portable fire extinguishers should be readily available.	40	F.5	C	CO_2 hose stations are provided in the 13.2 kV switchgear room, and water hose stations are provided near the entrances to the 4 kV switchgear rooms. Portable fire extinguishers will be provided for use in both areas.
156.	Fire protection provisions for remote safety-related panels; fire detection, combustible material control, and manual extinguishment.	40	F.6	C	See Section 3.2.
	<u>Station Battery Rooms</u>				
157.	Battery rooms should be separated from each other and other plant areas by 3-hour rated fire barriers.	41	F.7	C	See Section 3.2
158.	Ventilation should maintain hydrogen concentration below 2% by volume.	41	F.7	C	See Section 3.2
159.	Hose stations and portable extinguishers should be provided.	41	F.7	C	Hose stations and portable extinguishers are located in the vicinity of the battery rooms to provide effective coverage of these areas.
	<u>Turbine Lubrication and Control Oil Storage and Use Areas</u>				
160.	A fire wall with a minimum rating of 3 hours should separate all safety-related areas and equipment from turbine oil systems.	41	F.8	C	Three-hour fire walls with Class A fire doors separate areas containing safety-related equipment from the turbine oil systems.

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	Diesel Generator Areas				
161.	Diesel generators should be separated from each other and from other plant areas by fire barriers having a minimum rating of 3 hours.	42	F.9	AC	The diesel-generators are separated from each other and other parts of the plant by 3-hour fire walls with Class A fire doors.
162.	Automatic fire suppression such as AFFF (foam) or sprinklers should be installed.	42	F.9	C	Each diesel-generator room is provided with a pre-action sprinkler system actuated by heat detectors.
163.	Automatic fire detection should be provided to alarm locally and to alarm and annunciate in control room.	42	F.9	C	Each diesel-generator is provided with fire detectors which alarm locally and also annunciate in the control room.
164.	Drainage for fire fighting water and means for local manual venting of smoke should be provided.	42	F.9	AC	See Section 3.2
165.	The day tank should be located in separate 3-hour rated enclosure capable of containing the entire tank capacity.	42	F.9.a	C	Each day tank is located in a separate 3-hour rated enclosure capable of containing the entire tank capacity of 800 gallons.
166.	The day tank enclosure should be ventilated to avoid accumulation of of oil fumes.	42	F.9.a	NC	Each day tank is located in a totally enclosed vault area.
167.	The day tank enclosure should be protected by automatic fire suppression.	42	F.9.b	C	See Section 3.2
	Diesel Fuel Oil Storage Areas				
168.	Recommended locations for diesel fuel oil storage tanks.	42	F.10	C	See Section 3.2
169.	Diesel fuel oil tanks located in separate buildings should be provided with automatic fire suppression.	43	F.10	NA	Diesel fuel oil tanks are buried.

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170.	Diesel fuel oil tanks should not be located directly above or below safety-related systems or equipment regardless of fire rating separation.	43	F.10	C	No safety-related equipment is located above the buried tanks.
	Safety-Related Pumps				
171.	Separation of safety-related pumps by fire barriers; use of automatic sprinklers.	44	F.11	C	See Section 3.2
172.	Early warning fire detection should be installed with alarm and annunciation locally and in the control room.	44	F.11	C	Early warning fire detection is provided in all areas housing safety-related pumps.
173.	Local hose stations and portable extinguishers should also be provided.	44	F.11	NC	Except for the spray pond pump structure, hose stations and portable fire extinguishers are provided for use in all areas housing safety-related pumps. In consideration of the low combustible loading in the spray pond pump structure, portable extinguishers are deemed adequate to control and extinguish a fire at any pump.
174.	Equipment pedestals or curbs and drains should be provided to remove and direct water away from safety-related equipment.	44	F.11	C	Safety-related equipment is mounted on pedestals or suitable framework. Drainage facilities are provided throughout the plant as required.
175.	Provisions should be made for manual control of the ventilation system for smoke removal.	44	F.11	C	See item 76
	New Fuel Area				
176.	Portable extinguishers should be located within this area.	44	F.12	C	A portable extinguisher is available in the area immediately adjacent to the new fuel storage vault.

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177.	Hose stations should be located within hose reach of this area.	44	F.12	C	A hose station is located adjacent to the new fuel storage vault.
178.	Automatic fire detection should alarm and annunciate in the control room and alarm locally.	44	F.12	NC	There is no fire detection provided on the refueling floor level in the reactor enclosure.
179.	Combustibles should be limited to a minimum in the new fuel area.	45	F.12	WC	Combustibles will be controlled by administrative procedures. See note 1.
180.	Storage area drainage capability	45	F.12	C	See Section 3.2
181.	The storage configuration of new fuel should be such that critically is precluded for any water density that might occur during fire fighting.	45	F.12	C	See Section 3.2
	Spent Fuel Pool Area				
182.	Local hose stations and portable extinguishers should be provided.	45	F.13	C	Hose stations and portable extinguishers are available at the spent fuel storage pool.
183.	Automatic fire detection should be provided to alarm and annunciate in the control room and to alarm locally.	45	F.13	NC	See item 178
	Radwaste Enclosure				
184.	The radwaste enclosure should be separated from other areas of the plant by fire barriers having at least 3-hour ratings.	45	F.14	C	The radwaste enclosure is separated from other parts of the plant by 3-hour fire barriers with Class A fire doors.
185.	Automatic sprinklers should be used in areas where combustible materials are located.	45	F.14	C	See Section 3.2
186.	Automatic fire detection should be provided to annunciate and alarm in the control room and alarm locally.	45	F.14	AC	See Section 3.2

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187.	Ventilation systems should be capable of being isolated during a fire.	45	F.14	C	The radwaste enclosure ventilation system is capable of being isolated. Fire dampers and doors restrict the spread of fire.
188.	Water should drain to liquid radwaste sumps.	45	F.14	C	All drainage in the radwaste enclosure is to liquid radwaste sumps.
	Decontamination Areas				
189.	The decontamination areas should be protected by automatic sprinklers if flammable liquids are stored.	46	F.15	C	See Section 3.2
190.	Automatic fire detection should be provided to annunciate and alarm locally.	46	F.15	NC	No automatic fire detection is provided for the decontamination areas.
191.	The ventilation system should be capable of being isolated.	46	F.15	C	The ventilation systems for the access control and radwaste enclosure decontamination rooms can be isolated.
192.	Hose stations and portable extinguishers should be provided.	46	F.15	C	Hose stations and portable extinguishers are available for use in all decontamination areas.
	Safety-Related Water Tanks				
193.	Fire protection provisions for safety-related water tanks.	46	F.16	NA	The plant has no safety-related water tanks.

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	Cooling Towers				
194.	Cooling towers should be of noncombustible construction, or located so that a fire will not affect safety-related systems.	46	F.17	C	The cooling towers are of noncombustible construction except for the fill material, which is polyvinyl chloride. No safety-related structures or systems are located near the cooling towers such that they could be affected by a fire in the cooling towers.
195.	Cooling towers should be of noncombustible construction when the basins are used for the ultimate heat sink or for the fire protection water supply.	46	F.17	AC	See Section 3.2
	Miscellaneous Areas				
196.	Miscellaneous areas (e.g., record storage areas, shops, warehouses, auxiliary boiler rooms) should be located so that a fire in such areas will not adversely affect any safety-related systems.	47	F.18	C	Warehouse, machine shop, record storage, auxiliary boiler room, and other miscellaneous areas are separated from areas containing safety-related systems by 3-hour rated fire barriers so that safe shutdown will not be jeopardized.
197.	Fuel oil tanks for auxiliary boilers should be buried, or provided with dikes to contain the entire tank contents.	47	F.18	C	No. 2 fuel oil and No. 6 fuel oil for the auxiliary boilers is stored in aboveground outdoor tanks which are provided with dikes large enough to contain the entire tank contents.
	Welding and Cutting, Acetylene-Oxygen Fuel Gas Systems				
198.	Storage locations should be chosen to permit fire protection by sprinkler systems.	47	G.1	AC	Compressed gas storage cylinders for welding are located outdoors. The requirements of NFPA No. 51 and 51B will be followed.

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199.	Local hose stations and portable extinguishers should be provided.	47	G.1	C	A local hose station and portable extinguishers are available.
200.	The requirements of NFPA 51 and 51B are applicable to these hazards.	47	G.1	WC	See item 198
201.	A permit system should be required for utilization of this equipment.	47	G.1	WC	See note 1
	Storage Areas for Dry Ion Exchange				
202.	Dry ion exchange resins should not be near essential safety-related systems.	47	G.2	WC	Storage areas will be remote from essential safety-related systems.
203.	Dry unused resins should be protected by automatic wet pipe sprinkler systems.	47	G.2	NC	Local hose stations and portable fire extinguishers are provided in the vicinity of storage areas for dry resins.
204.	Fire detection by smoke and heat detectors should alarm and annunciate in the control room and alarm locally.	47	G.2	NC	No fire detection is provided for dry resin storage areas.
205.	Local hose stations and portable extinguishers should be provided.	47	G.2	C	See item 203
206.	Storage areas of dry resins should have curbs and drains.	47	G.2	NC	No curbs are provided.
	Hazardous Chemicals				
207.	Recommendations for storage of hazardous chemicals.	48	G.3	WC	See Section 3.2
208.	Materials that collect and contain radioactivity (e.g., spent ion exchange resins, charcoal filters, HEPA filters) should be stored in closed metal tanks or containers located in areas free from ignition sources or combustibles.	48	G.4	WC	See note 1

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		Page	Item		
209.	These materials should be protected from exposure to fires in adjacent areas.	48	G.4	WC	See note 1
210.	Consideration should be given to requirements for removal of isotopic decay heat from entrained radioactive materials.	48	G.4	C	Provisions for accommodating decay heat are considered when selecting containers.

(1) Administrative controls and procedures concerning fire protection will be developed during preparation of plant procedures.

3.2 EXPLANATORY NOTES

Item 7

Appendix A Guideline

A single failure in the fire suppression system should not impair both the primary and backup fire suppression capability. For example, redundant fire water pumps with independent power supplies and controls should be provided.

LGS Design

As described in Section 2.1.2, fire water is supplied by two redundant pumps, each of which is capable of providing the design fire protection system flowrate at the design pressure. Power for the motor-driven fire pump is provided from either of two independent offsite power sources. The controls for the diesel engine-driven fire pump are dc-operated and are powered from batteries which supply only the engine-driven fire pump. Therefore, no single failure of the power supplies can affect both fire pumps. By the use of sectional isolation valves, damaged portions of the yard fire main loop can be isolated without affecting the major portion of the loop. The provision of hose reels and portable extinguishers for manual fire fighting precludes the possibility of a single failure in an automatic fire suppression system from disabling all means of fire suppression for a given area.

Item 9

Appendix A Guideline

Failure or inadvertent operation of the fire suppression system should not incapacitate safety-related systems or components.

LGS Design

Although it can be postulated that failure or inadvertent operation of the fire suppression system may incapacitate safety-related systems or components, such failure or inadvertent operation will not prevent safe shutdown from being achieved through the use of redundant safety-related systems.

Item 13

Appendix A Guideline

On multiple-reactor sites where there are operating reactors and construction of remaining units is being completed, the fire protection program should provide continuing evaluation and include additional fire barriers, fire protection capability, and administrative controls necessary to protect the operating units from construction fire hazards. The superintendent of the operating plant should have the lead responsibility for site fire protection.

LGS Design

Administrative procedures will be prepared to protect the operating Unit 1 from fire hazards associated with construction of Unit 2. Special precautions will be taken to prevent and control fire hazards. Use of open flames and welding or cutting equipment will be properly supervised.

Construction of both the underground yard fire main and the fire water distribution piping inside both units of the plant will be completed prior to Unit 1 operation so that manual hose station coverage will be available in Unit 2 as well as Unit 1. Portable fire extinguishers will also be available in the Unit 2 portions of the plant during its construction. The construction site will be kept clean and orderly and contractors' sheds will be kept outside the confines of new construction.

Item 14

Appendix A Guideline

Simultaneous fires in more than one reactor need not be postulated, where separation requirements are met. A fire involving more than one reactor unit need not be postulated except for facilities shared between units.

LGS Design

The fire protection program is based on the occurrence of a fire in only one reactor unit or one common area at a time. The unitized portions of the turbine enclosures and reactor enclosures are separated from each other and from common areas by 3-hour rated fire walls. The operating floor of the turbine enclosures and the refueling floor of the reactor enclosures are common areas which serve both units. The control structure and the radwaste enclosure are common areas which are separated from the adjacent reactor enclosures and turbine enclosures by 3-hour rated fire walls. The Unit 1 and Unit 2 diesel-generator enclosures are separated from the adjacent portions of the reactor enclosures by 3-hour rated fire walls. The spray pond pump structure, which is located away from all other structures, is a common area and is separated into two halves by a 3-hour rated fire wall.

Item 27

Appendix A Guideline

Quality assurance (QA) programs of applicants and contractors should be developed and implemented to assure that the requirements for design, procurement, installation, and testing and administrative controls for the fire protection program for safety-related areas as defined in this Branch Position are satisfied. The program should be under the management control of the QA organization.

LGS Design

The QA program described below will be under the management control of the PECo Engineering & Research Department QA organization during the construction phase.

1. Design Control and Procurement Document Control

The design review performed to compare the Limerick design to the BTP guidelines provides assurance that necessary design features are included in appropriate design and procurement documents.

Deviations from the design and procurement documents will be controlled by mechanisms specified in the 10 CFR 50, Appendix B QA program for this project.

2. Instructions, Procedures, and Drawings

These requirements will be met during the construction phase through the use of a documented, final installation inspection and through implementation of a written pre-operational test.

3. Control of Purchased Material, Equipment, and Services

Based upon the status of procurements and the identification of significant design or manufacturing features, certain fire protection equipment may be subject to shop inspection during manufacture.

Receipt inspection at the construction site shall be performed.

4. Inspection

These requirements will be met through the use of a documented, final installation inspection and through implementation of a written preoperational test.

5. Test and Test Control

Documented preoperational test procedures including evaluation of results and followup action, if indicated, shall be employed to meet these requirements relative to the construction phase of the plant.

6. Inspection, Test, and Operating Status

Installation inspections, as described in Item 4 above, shall be documented in such a manner as to indicate the acceptability of the item/activity inspected. Deficiencies shall be identified and corrected in accordance with mechanisms specified in the 10 CFR 50, Appendix B QA program for this project.

Satisfactory completion of the preoperational test and release for operation shall be accomplished and documented in accordance with mechanisms specified in the 10 CFR 50, Appendix B QA program for this project.

7. Nonconforming Items

Nonconforming items shall be identified, controlled, and corrected in accordance with the mechanisms specified in the 10 CFR 50, Appendix B QA program for this project.

8. Corrective Action

Conditions adverse to fire protection (such as failures, malfunctions, deficiencies, deviations, defective components, and nonconformances) during the construction phase shall be reported and corrected in accordance with mechanisms specified in the 10 CFR 50, Appendix B QA program for this project.

9. Records

Records shall be prepared and maintained to furnish evidence that the criteria described in Items 1 through 10 are being met for activities affecting the fire protection program.

10. Audits

The activities described above are subject to audit. In addition, implementation of receipt inspections, final installation inspections, and pre-operational tests shall be subject to audit to conform with documented instructions, procedures, and drawings.

Item 29

Appendix A Guideline

Plant layouts should be arranged to: (2) Separate redundant safety-related systems from each other so that both are not subject to damage from a single fire hazard.

LGS Design

In some cases, components of redundant safety-related systems are located in the same fire area. In each case, the potential for damage to both redundant systems from a single fire hazard has been evaluated, as described in Chapter 5. The capability to safely shut the plant down has been assured, based on consideration of physical separation between the redundant systems, additional fire barriers provided between the systems, and combustible loading in the fire area.

Item 30

Appendix A Guideline

In order to accomplish 1.(a) above, safety-related systems and fire hazards should be identified throughout the plant. Therefore, a detailed fire hazard analysis should be made. The fire hazards analysis should be reviewed and updated as necessary.

LGS Design

As described in Chapter 4, an evaluation of the combustible materials present in the various areas of the plant has been performed. These combustible materials and their quantities are listed in Table A-1. The safety-related systems located in each fire area were identified as part of the safe shutdown analysis, described in Chapter 5. Table A-1 identifies which fire areas and fire zones contain safety-related components.

Item 34

Appendix A Guideline

Interior wall and structural components, thermal insulation materials, radiation shielding materials and soundproofing should be noncombustible.

LGS Design

Most interior walls are constructed of either reinforced concrete, or concrete masonry units. Limited use is made of walls constructed of metal studs with gypsum plaster on expanded metal lath. Structural components consist of structural steel or reinforced concrete. Thermal insulation materials are noncombustible. Soundproofing materials, if required, will be noncombustible. Radiation shielding consists of concrete, concrete masonry unit, or steel plates.

Item 35

Appendix A Guideline

Interior finishes should be noncombustible or listed by a nationally recognized testing laboratory, such as Factory Mutual or Underwriters Laboratory, Inc, for flame spread, smoke, and fuel contribution of 25 or less in its use configuration (ASTM E-84 Test, "Surface Burning Characteristics of Building Materials").

LGS Design

Areas containing systems or equipment required for safe shutdown of the plant are unfinished, or are finished with materials which are either noncombustible or are listed by a nationally recognized testing laboratory for flame spread, smoke, and fuel contribution of 25 or less in its use configuration.

Item 36

Appendix A Guideline

Metal deck roof construction should be noncombustible (see the building materials directory of the Underwriters Laboratory, Inc) or listed as Class I by Factory Mutual System Approval Guide.

LGS Design

Metal roof deckings consist of manufactured fluted panels with rigid insulation and builtup roofing membrane with gravel. This is a Class A UL fire-resistive rated builtup roofing system.

Item 38

Appendix A Guideline

Concealed spaces should be devoid of combustibles.

LGS Design

Electrical cables (associated primarily with control room annunciators and control room lighting) are routed in cable tray, gutter, and conduit above the suspended ceiling in the control room. The cables in gutter and cable tray will be coated with a fire-retardant material to prevent the propagation of fire along the cables. In addition, fire detectors will be located above the suspended ceiling to provide early warning of fires occurring within that area.

Item 42

Appendix A Guideline

Drains should also be provided in other areas where hand hose lines may be used if such fire fighting water could cause unacceptable damage to equipment in the area.

LGS Design

Most plant areas are provided with drainage facilities adequately sized to remove all the water discharged from a 1-1/2 inch hand hose line. Some areas which contain primarily electrical and electronic equipment are not provided with floor drains. For these latter areas, the doors which would be open to provide access for hand hose usage would also provide a flow path for fire protection water to drain to areas not containing safety-related components.

Item 44

Appendix A Guideline

Drains in areas containing combustible liquids should have provisions for preventing the spread of the fire throughout the drain system.

LGS Design

Drains from the turbine oil systems discharge to an oil separator remotely separated from safety-related systems. Drains from each diesel-generator room are provided with traps prior to connection into an oil separator receiver serving the diesel-generator rooms. The combination of traps and the separation effectively provides for the prevention of fire propagation through this drainage system.

Item 46

Appendix A Guideline

Floors, walls, and ceilings enclosing separate fire areas should have minimum fire rating of three 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 barrier itself.

LGS Design

The reactor enclosures, turbine enclosures (main portion), turbine auxiliary bays, diesel-generator enclosures, radwaste enclosure, and administration building are separated from each other by 3-hour rated fire walls. Walls internal to these structures (and also the spray pond pump structure) which serve as boundaries between different fire areas are provided with fire ratings or construction details consistent with the fire hazard existing in each area. The locations of fire-rated walls are shown on Figures B-4 through B-12, and the walls surrounding each fire area are further described in the fire area discussions contained in Sections 5.3 through 5.9.

Concrete floor slabs in the control structure and reactor enclosures are provided with 3-hour rated seals for penetration openings in the slabs. The structural steel beams supporting the floor slabs at four elevations in the control structure (254, 269, 289 and 304 feet) have been fireproofed to provide a 3-hour rating for the complete floor assembly. The structural steel beams supporting floor slabs in other areas have not been fireproofed. The fire ratings of floor slabs above and below each fire area are listed in the fire area discussions contained in Sections 5.3 through 5.9. Those slabs which are shown as "3 hr*" are capable of being rated as 3-hour fire barriers, except for the lack of fireproofing on the structural steel beams supporting the slab.

Fire barrier penetrations, including piping, conduits, and cable trays, will be sealed with materials and methods acceptable to American Nuclear Insurers (ANI), to provide a fire resistance rating consistent with the rating of the barrier.

Item 47

Appendix A Guideline

Door openings should be protected with equivalent rated doors, frames, and hardware that have been tested and approved by a nationally recognized laboratory.

LGS Design

Door openings in rated fire barriers are provided with fire doors having ratings consistent with the barrier itself. With the exception of steamtight doors, access openings in 3-hour barriers are provided with Class A (3-hour) UL-labeled doors and access openings in 2-hour barriers are provided with Class B (1-1/2 hours) UL-labeled doors. Although not provided with UL labels, steamtight doors which will be designated as fire rated are certified by the manufacturer to conform to standards established for UL-labeled fire-rated doors. These steamtight doors are identified in the fire area discussions contained in Sections 5.3 through 5.9 by a double asterisk (**) following the indicated fire rating.

Item 48

Appendix A Guideline

Such doors should be normally closed and locked or alarmed with alarm and annunciation in the control room.

LGS Design

Fire-rated doors are either unlockable or are locked only in the entry direction as required by NFPA NO. 101, "Life Safety Code." Specified doors are locked in accordance with the security plan. Security doors alarm and annunciate in the control room. Fire doors which are not also security doors are generally not alarmed nor annunciated in the control room.

All fire doors are normally closed or are equipped with either fusible links or magnetic door holders. Those doors used for communication between various areas of the plant are not locked. Doors to isolated areas, such as the diesel-generator rooms, and doors used for access control are normally locked.

Although locked doors provide no access for fire fighting nor egress for personnel to escape a fire, certain fire doors are maintained locked because of access control. Doors which must be locked are equipped with door closers and panic hardware as required and specified by OSHA, NFPA No. 101, "Life Safety Code," and local building codes.

Item 51

Appendix A Guideline

Bulk gas storage (either compressed or cryogenic) should not be permitted inside structures housing safety-related equipment. Storage of flammable gas such as hydrogen, should be located outdoors or in separate detached buildings so that a fire or explosion will not adversely affect any safety-related systems or equipment.

LGS Design

Compressed gases are stored either outdoors or in non-safety-related structures whenever possible. However, compressed gases with safety-related uses must be stored in safety-related structures. For this reason, compressed gas cylinders associated with the primary containment instrument gas system and containment combustible gas monitoring system are located in the reactor enclosure. Compressed gas cylinders used for welding are stored in the construction shop (during periods of usage only) and the machine shop. Hydrogen used in cooling of the main generators is provided from hydrogen cylinders stored at an outdoor location that is separated from all structures. The compressed propane gas used for ignition of the auxiliary boilers is also stored outdoors. The supply line penetrates only the auxiliary boiler enclosure.

Item 53

Appendix A Guideline

Use of compressed gases (especially flammable and fuel gases) inside buildings should be controlled. (Refer to NFPA 6, "Industrial Fire Loss Prevention.")

LGS Design

The usage of compressed gases for cutting and welding is limited to those activities authorized as to be outlined in the administrative procedures.

The usage of compressed fuel gases for laboratory and shop use is limited to a low pressure supply system for Bunsen burners in the radioactive chemistry laboratory in the radwaste enclosure and the instrument repair shop on the 269-foot level of the control structure. Compressed fuel gas cylinders and gas pressure-reducing stations are installed outside of the building at a location that does not expose nuclear safety-related structures, systems, and equipment to potential damage from fire at the storage location.

Item 54

Appendix A Guideline

The use of plastic materials should be minimized. In particular, halogenated plastics such as polyvinyl chloride (PVC) and neoprene should be used only when substitute noncombustible materials are not available.

LGS Design

The use of plastic materials within the plant has been minimized to the greatest extent practicable. However, alternatives to plastic or elastomeric materials for electrical cable insulating systems, with an optimum balance of electrical, physical, and environmental characteristics, are not available. Cable insulation and jacketing materials are chosen for their fire-retardant and self-extinguishing properties, such that fuel contribution to a cable fire is minimized and propagation of a fire along cables is self-limiting in the absence of an external fire hazard. The types of electrical cable insulation and jacketing used in the plant are listed in Table A-3.

Electrical components located throughout the plant, such as control panels, relay panels, motor control centers, and power distribution panels, contain relatively small amounts of plastic in the form of terminal blocks, relay cases, circuit breaker cases, and other small items. The use of plastic in these applications is necessary because of its electrically insulating properties.

Plastic materials are also used for electrical conduit, but only when totally embedded within poured concrete walls and floor slabs.

Item 58

Appendix A Guideline

Automatic water sprinkler systems should be provided for cable trays outside the cable spreading room.

LGS Design

Concentrations of cable trays near the primary containment electrical penetrations at elevations 253 and 283 feet are provided with automatic sprinkler systems. Automatic sprinkler systems are not provided for cable trays in other areas of the plant.

Redundant cables outside the cable spreading room are routed with separation in accordance with Regulatory Guide 1.75. Cable tray arrangement and/or fire barriers are designed so that a fire cannot prevent redundant safety system components from performing their design safety functions.

Item 60

Appendix A Guideline

Manual hose stations and portable hand extinguishers should be provided as backup.

LGS Design

With the exception of those areas (identified in Item 58) in which automatic sprinkler systems are provided, manual hose stations and portable extinguishers serve as both the primary and backup means of fire suppression for cable trays outside the cable spreading room.

Item 61

Appendix A Guideline

Safety-related equipment in the vicinity of such cable trays, that does not itself require water fire protection, but is subject to unacceptable damage from sprinkler water discharge, should be protected from sprinkler system operation or malfunction.

LGS Design

Sprinkler systems are provided in certain areas for protection of safety-related systems and equipment other than cable trays. In such areas, sprinkler system discharge is controlled to prevent unacceptable damage to adjacent equipment.

Safety-related electrical equipment, such as motor control centers, located in areas protected by automatic water extinguishing systems will be protected against water.

Item 62

Appendix A Guideline

Cable and cable tray penetration of fire barriers (vertical and horizontal) should be sealed to give protection at least equivalent to the fire barrier. The design of fire barriers for horizontal and vertical cable trays should, as a minimum, meet the requirements of ASTM E-119, "Fire Test of Building Construction and Materials," including the hose stream test.

LGS Design

Sealants for cable and cable tray penetrations of fire barriers are based on the use of materials and methods which have undergone a test program. Such sealants are consistent with the recommendations of American Nuclear Insurers (ANI) and of ASTM E-119.

Item 63

Appendix A Guideline

Fire breaks should be provided as deemed necessary by the fire hazards analysis. Flame or fire-retardant coatings may be used as a fire break for grouped electrical cables to limit spread of fire in cable routings. (Possible cable derating owing to use of such coating materials must be considered during design.)

LGS Design

Vertical runs of cable trays are provided with fire breaks at solid floor and ceiling penetrations and at intermediate levels as necessary such that the height between fire breaks does not exceed 20 feet. Fire breaks are also provided for horizontal runs of cable trays at fire barrier penetrations.

Fire breaks in other tray installations will be provided as deemed necessary by a fire hazard analysis.

Item 64

Appendix A Guideline

Electrical cable constructions should as a minimum pass the current IEEE No. 383 flame test. (This does not imply that cables passing this test will not require additional fire protection).

LGS Design

With the exception of cables associated with the lighting and communication systems, electrical cable insulation and jacketing systems pass the IEEE No. 383 flame test. Cables associated with the lighting and communication systems are routed exclusively in conduit and are not routed together with cables associated with other plant systems.

Item 65

Appendix A Guideline

To the extent practical, cable construction that does not give off corrosive gases while burning should be used.

LGS Design

The performance characteristics and verifying tests for cables purchased for this plant are specified in three separate technical specifications covering approximately 100 different cables with voltage insulation ratings of 15 kV, 5 kV, and 600 V.

Typical tests required on cable insulation are:

A. Physical Tests (Section 3.6 of IPCEA S-66-524 (Typical))

   1. Initial
   2. After accelerated aging
   3. Moisture absorption

B. Electrical Tests (Section 3.7.2 of IPCEA S-66-524 (Typical))

C. Flame-Resisting Tests

   1. Prototype samples tested to Section 5.7.3 of Specification 8031-E-28 (Typical), "Philadelphia Electric Cable Tray Fire Test"

The design considerations for cabling involve an optimized balance of electrical, physical, and environmental characteristics. Among the environmental prerequisites of the jacketing material are high flame retardance, radiation resistance, and capability to survive a postulated accident condition. Typical insulating material for the individual conductors consists of cross-linked polyethylene insulation with a Neoprene protective covering. Fire involvement of these jacketing materials will give off potentially corrosive gases. However, alternative materials which satisfy the primary design basis and do not release potentially corrosive gases were not available when purchase orders were placed for cables for this plant. It should be noted that these gases are not in themselves corrosive, but will form corrosive acids in the presence of substantial moisture or water.

Due to lack of suitable alternative materials, the cable constructions used are considered to have reduced corrosive gas generation "to the extent practical".

Item 69

Appendix A Guideline

Cables should not be installed in floor trenches or culverts in the control room.

LGS Design

Although cables are not located in concealed floor spaces in the control room, cables are installed in the raised floor sections in the auxiliary equipment room. Automatic fire detection systems and automatic halon suppression systems are provided in the floor sections in the auxiliary equipment room. Removable floor plates permit access for manual fire fighting operations.

Item 70

Appendix A Guideline

The products of combustion that need to be removed from a specific fire area should be evaluated to determine how they will be controlled. Smoke and corrosive gases should generally be automatically discharged directly outside to a safe location. Smoke and gases containing radioactive materials should be monitored in the fire area to determine if release to the environment is within the permissible limits of the plant Technical Specifications.

LGS Design

The products of combustion from a fire in any area of the plant will be removed by the normal plant ventilating systems and exhausted through the ventilation stacks above the reactor roof. Radiation monitors are provided in the ventilation stacks to determine if the radioactive release to the environment is within the permissible limits of the plant Technical Specifications.

Exhaust from the control room is discharged directly to the atmosphere by alignment of dampers. Exhaust from potentially contaminated areas of the turbine enclosure and the control structure is discharged through deep bed charcoal filters prior to release to the atmosphere, with a means provided to bypass the filters for direct discharge. Independent systems provide filtered exhaust from the radwaste enclosure and the reactor enclosure with discharge through ventilation stacks above the reactor enclosure roof. Standby fans in all systems may be manually started to augment the normal venting capability of the systems.

Exhaust from the cable spreading room is through transfer grilles into the generator equipment area of the turbine enclosure.

Item 71

Appendix A Guideline

Any ventilation system designed to exhaust smoke or corrosive gases should be evaluated to assure that inadvertent operation or single failures will not violate the controlled areas of the plant design. This requirement includes containment functions for protection of the public and maintaining habitability for operations personnel.

LGS Design

No portion of the ventilation system is specifically dedicated to smoke removal except for the purge mode of the control room ventilation system (see Items 168 and 169). The basic design of the overall plant ventilation system considers the effects of inadvertent operation and single failure. The fire dampers provided within the ventilation system affect only those portions isolated by the dampers with no adverse effects on the balance of the systems.

Item 72

Appendix A Guideline

The power supply and controls for mechanical ventilation systems should be run outside the fire area served by the system.

LGS Design

The power supply and controls for ventilation and smoke removal systems for safety-related areas are run and operated outside the area served by the system. These provisions assure that the ventilation systems remain unimpaired and accessible for manual operation during a postulated fire event inside the area protected.

Item 73

Appendix A Guideline

Fire suppression systems should be installed to protect charcoal filters in accordance with Regulatory Guide 1.52, "Design Testing and Maintenance Criteria for Atmospheric Cleanup Air Filtration."

LGS Design

Manually-actuated sprinkler systems with water spray nozzles are provided as an integral component of the charcoal filters in the standby gas treatment system, the control room emergency ventilation system, the turbine enclosure equipment compartment exhaust system, the reactor enclosure equipment compartment exhaust system, and the radwaste enclosure tank vent exhaust system.

Heat detectors monitor charcoal filter temperature and alarm in the control room on high temperature.

Item 75

Appendix A Guideline

Stairwells should be designed to minimize smoke infiltration during a fire. Staircases should serve as escape routes and access routes for fire fighting. Fire exit routes should be clearly marked. Stairwells, elevators and chutes should be enclosed in masonry towers with minimum fire rating of three hours and automatic fire doors at least equal to the enclosure construction, at each opening into the building. Elevators should not be used during fire emergencies.

LGS Design

The reactor enclosures, turbine enclosures, and radwaste enclosure are each provided with at least two separated stairwells, and the control structure is provided with its own stairwell. These stairwells are completely enclosed by fire-rated walls and are designed to provide escape routes and access routes for fire fighting. The control structure and the two reactor enclosures are each provided with an elevator shaft adjacent to one of the stairwells. These elevator shafts also have fire-rated walls.

The walls of the stair towers and elevator shafts consist of nominal 8-inch thick (solid grouted) concrete masonry units and/or 6-inch thick reinforced concrete, equivalent to a 2-hour rated fire barrier. Although the walls of stair towers and elevator shafts may be capable of qualifying for a higher fire rating, the doors are B-labeled (1-1/2 hour), consistent with NFPA No. 80, for use in openings in two-hour enclosures of vertical communication within the building. The doors of the stair towers, being self-closing, will minimize any smoke infiltration during a fire.

Item 76

Appendix A Guideline

Smoke and heat vents may be useful in specific areas such as cable spreading rooms and diesel fuel oil storage areas and switchgear rooms. When natural-convection ventilation is used, a minimum ratio of 1 square foot of venting area per 200 square feet of floor area should be provided. If forced-convection ventilation is used, 300 cfm should be provided for every 200 square feet of floor area. See NFPA No. 204 for additional guidance on smoke control.

LGS Design

The cable spreading rooms and switchgear rooms are not provided with smoke exhaust systems separate from the normal ventilation. Smoke exhaust capabilities for these areas are part of the general exhaust systems. For the diesel fuel oil storage areas, sufficient ventilation air for smoke removal is provided by the diesel engine room exhaust system.

The turbine enclosure is provided with smoke and heat vents in a ratio of 1 square feet of venting area to each 100 square feet of floor area. Smoke and heat removal for all other buildings is accomplished with the normal ventilation exhaust system at a minimum equivalent of 1 square feet of venting area to each 200 square feet of floor area, in accordance with ANI requirements.

Item 77

Appendix A Guideline

Self-contained breathing apparatus, using full face positive pressure masks, approved by NIOSH (National Institute for Occupational Safety and Health - approval formerly given by the U.S. Bureau of Mines) should be provided for fire brigade, damage control, and control room personnel. Control room personnel may be furnished breathing air by a manifold system piped from a storage reservoir if practical. Service or operating life should be a minimum of one-half hour for the self-contained units.

At least two extra air bottles should be located onsite for each self-contained breathing unit. In addition, an onsite 6-hour supply of reserve air should be provided and arranged to permit quick and complete replenishment of exhausted supply air bottles as they are returned. If compressors are used as a source of breathing air, only units approved for breathing air should be used. Special care must be taken to locate the compressor in areas free of dust and contaminants.

LGS Design

Self-contained breathing apparatus will be available for use by control room personnel and fire brigade members. The breathing apparatus will have a minimum operating life of 4 hours for control room personnel and 1 hour for fire brigade members.

An onsite reserve air supply of six hours for at least five persons will be provided in stored air bottles. Compressors, if used, will be units approved for breathing air.

Item 79

Appendix A Guideline

Fixed emergency lighting should consist of sealed beam units with individual 8-hour minimum battery power supplies.

LGS Design

The emergency lighting system consists of an ac subsystem and an ac/dc subsystem. The emergency ac lighting is powered from Class IE buses which automatically transfer to the standby diesel-generators upon loss of the normal power source. Emergency ac lighting is provided throughout the plant to maintain minimum lighting levels necessary for access and for emergency-related activities. All lighting in the spray pond pump structure (with the exception of the ac/dc lights at the exit doors) is associated with the emergency ac lighting system.

The emergency ac/dc lighting is normally powered from the Class 1E buses. In the event of loss of the Class IE ac source, an automatic transfer switch immediately transfers this lighting to the 125 V dc non-Class IE station battery source. All emergency ac/dc lighting fixtures are of the incandescent type. Emergency ac/dc lighting is provided for the following areas:

a. Control room
b. Auxiliary equipment room
c. Cable spreading room

d. Static inverter room
e. 4kV switchgear compartment
f. 13kV switchgear compartment
g. Drywell
h. HPCI, RCIC, and RHR pump compartments (at exit doors only)
i. Diesel-generator compartments
j. Spray pond pump structure (lights with individual battery packs, at exit doors only)
k. Stairways and access corridors.

The cables for both emergency lighting subsystems are routed exclusively in conduit, most of which is embedded in concrete. The cables for the two subsystems are routed through separate fire areas so that a fire in any given fire area would not result in loss of both emergency lighting subsystems for a different safety-related fire area.

Item 81

Appendix A Guideline

Fixed emergency connunication should use voice powered head sets at preselected stations.

LGS Design

Requirements for the reporting of fires and the direction of fire fighting efforts are considered in the design of the plant communication system. Fixed emergency communication equipment is located at every floor level of the plant at preselected stations but does not include voice powered head sets.

Item 82

Appendix A Guideline

Fixed repeaters installed to permit use of portable radio communication units should be protected from exposure fire damage.

LGS Design

Portable radio communication units will not be provided at the site.

The use of portable radios has been known to energize or de-energize electrical equipment and components. This effect has been considered in light of the requirement that fire protection equipment should not adversely affect shutdown equipment.

Item 83

Appendix A Guideline

Fire detection systems should as a minimum comply with NFPA 72D, "Standard for the Installation, Maintenance and Use of Proprietary Protective Signaling Systems."

LGS Design

The fire and smoke detection system is in compliance with NFPA 72A. The system is electrically supervised to detect circuit breaks, ground faults, and power failure.

The system also complies with the requirements of NFPA 72D for a Class B system with the following exceptions:

a. No device is provided for permanently recording incoming signals with date and time of receipt.

b. Operation and supervision of the system is not the primary function of the operators.

c. In lieu of complete reliance on NFPA 72E, smoke and fire detector locations are established by a qualified fire protection engineer.

Item 87

Appendix A Guideline

Fire detection and actuation systems should be connected to the plant emergency power supply.

LGS Design

Several detection and actuation systems are utilized throughout the plant.

Power for the early warning fire and smoke detection systems is provided from a Class IE ac motor control center, which is powered from the standby diesel-generators in the event of loss of offsite power.

The detection and actuation system for the total flooding carbon dioxide system is powered from Class IE ac motor control centers (for power) and from the Class IE dc power supply (for controls). The Class IE motor control centers are powered from the standby diesel-generators in the event of loss of offsite power.

The detection and actuation systems for deluge and pre-action sprinkler systems are connected to the Class IE dc power supply.

Item 95

Appendix A Guideline

The connection to the yard fire main loop from each fire pump should be widely separated, preferably located on opposite sides of the plant.

LGS Design

The connections to the yard fire main loop from each of the fire pumps are spaced about 10 feet apart. Since these connections are buried underground, they are protected from damage. The two connections are separated by a post indicator valve on the fire main loop and additional valves are provided and arranged so that either connection may be isolated while retaining 100% water supply capacity to the fire main loop.

Item 98

Appendix A Guideline

Pumps and drivers should be located in rooms separated from the remaining pumps and equipment by a minimum three-hour fire wall.

LGS Design

The two fire pumps are located at the west end of the circulating water pump structure, which is north of the power block. The electric motor-driven fire pump and controls are located in an area common with the circulating water pumps. The diesel engine-driven fire pump and controls are in a separate compartment that is provided with floor, walls, and ceiling that are rated as 3-hour fire barriers. The diesel oil day tank is located in a curbed area within the diesel engine-driven fire pump compartment. The door to the diesel engine-driven fire pump compartment is a Class A fire door and the compartment is protected by an automatic wet pipe sprinkler system.

Item 103

Appendix A Guideline

The firewater supply (total capacity and flow rate) should be calculated on the basis of the largest expected flow rate for a period of two hours, but not less than 300,000 gallons. This flow rate should be based (conservatively) on 1000 gpm for manual hose streams plus the greater of:

(1) all sprinkler heads open and flowing in the largest designed fire area; or

(2) the largest open head deluge system(s) operating.

LGS Design

Fire protection water is supplied from the basins of the two cooling towers in the Unit 1 and Unit 2 circulating water systems. The total capacity of each cooling tower basin is 7,000,000 gallons. Each fire water pump takes suction from both cooling tower basins through connections to the 96-inch circulating water lines.

The cooling tower basin storage capacity exceeds the 370,000-gallon capacity required for two-hour operation of the turbine condenser compartment sprinkler system at 2090 gpm plus 1000 gpm for hose streams.

Item 108

Appendix A Guideline

A hose house, equipped with hose and combination nozzle, and other auxiliary equipment recommended in NFPA 24, "Outside Protection", should be provided as needed but at least every 1000 feet.

LGS Design

Hose cart houses are provided at 5 selected hydrants in the yard area at intervals of approximately 650 feet. Each hose cart will be equipped with the following fire fighting equipment:

a. 600 feet of 2-1/2" rubber lined hose
b. 400 feet of 1-1/2" rubber lined hose
c. One 30" playpipe
d. Two 1-1/2" adjustable spray nozzles
e. Two 1-1/2" ball shutoff
f. One 2-1/2" adjustable fog nozzle
g. One 2-1/2" ball shutoff

h. One siamese connection (gated wye)
i. 2-1/2" to 1-1/2" spanner wrench
j. One hydrant wrench
k. One fire axe

Item 110

Appendix A Guideline

Each automatic sprinkler system and manual hose station standpipe should have an independent connection to the plant underground water main. Headers fed from each end are permitted inside buildings to supply multiple sprinkler and standpipe systems. When provided, such headers are considered an extension of the yard main system.

LGS Design

Because of the high number of sprinkler systems and manual hose stations in the plant, it is impractical to provide a separate connection to the yard fire main for each sprinkler system and manual hose station standpipe. Therefore, sprinkler systems and manual hose stations are fed from a number of headers, each serving a particular area of the plant. These headers may be connected to the yard fire main at one end or both ends.

Item 111

Appendix A Guideline

Each sprinkler and standpipe system should be equipped with OS&Y (outside screw and yoke) gate valve, or other approved shutoff valve, and water flow alarm.

LGS Design

Each sprinkler and deluge system is provided with an OS&Y gate valve adjacent to the system's automatic control or alarm valve. Each sprinkler system is provided with local water flow alarms and control room annunciation. In the deluge and pre-action systems, the actuation of the heat responsive device initiates an alarm locally and in the control room.

Water flow in the standpipe systems due to manual hose station usage is indicated by pump running annunciation with the absence of automatic system actuation annunciation. Individual standpipe flow alarms are not provided.

Each connection of a fire water header to the yard fire main is provided with a post indicator valve to permit isolation of the header. In many cases, branch connections to the headers are provided with approved shutoff valves so that groups of sprinkler systems and/or manual hose stations can be isolated without interrupting the supply to other sprinkler systems and manual hose stations connected to the same header.

Item 112

Appendix A Guideline

Safety-related equipment that does not itself require sprinkler water fire protection, but is subject to unacceptable damage if wetted by sprinkler water discharge should be protected by water shields or baffles.

LGS Design

Safety-related equipment not requiring sprinkler protection is provided with water shields and/or protected from unacceptable water damage by zoned discharge or directional spray nozzles.

Item 113

Appendix A Guideline

All valves in the fire water systems should be electrically supervised. The electrical supervision signal should indicate in the control room and other appropriate command locations in the plant. (See NFPA 26, "Supervision of Valves.")

LGS Design

Other than the non-indicating gate valves with curb boxes controlling laterals to the fire hydrants, all valves in the yard fire loop and headers into the buildings are post indicator valves. The valves are locked in the open position using padlock-type locking devices. These valves are not equipped with supervisory (tamper) switches.

All of the fire protection water control OS&Y valves directly controlling each wet pipe sprinkler system, pre-action sprinkler system, and water spray system are provided with electrically actuated supervisory (tamper) switches with annunciation in the control room.

Item 115

Appendix A Guideline

Interior manual hose installation should be able to reach any location with at least one effective hose stream. To accomplish this, standpipes with hose connections, equipped with a maximum of 75 feet of 1-1/2 inch woven jacket-lined fire hose and suitable nozzles should be provided in all buildings, including containment, on all floors and should be spaced at not more than 100-foot intervals. Individual standpipes should be of at least 4-inch diameter for multiple hose connections and 2-1/2-inch diameter for single hose connections. These systems should follow the requirements of NFPA 14, "Standpipe and Hose Systems" for sizing, spacing and pipe support requirements.

LGS Design

Readily accessible hose reels or cabinet-mounted racks are installed throughout the plant and are spaced to provide coverage by effective hose streams. No hose stations are located inside the primary containment. Hose stations are provided with a maximum of 100 feet of 1-1/2 inch woven jacket-lined fire hose equipped with adjustable fog and straight stream nozzles.

Wet standpipes are not less than 3 inches in diameter for one or two hose connections and 4 inches in diameter for more than two hose connections. The standpipe and hose station installations are constructed in accordance with NFPA No. 14.

Item 116

Appendix A Guideline

Hose stations should be located outside entrances to normally unoccupied areas and inside normally occupied areas. Standpipes serving hose stations in areas housing safety-related equipment should have shutoff valves and pressure reducing devices (if applicable) outside the area.

LGS Design

The only area of the plant which houses safety-related equipment and is considered to be normally occupied is the control room. Hose stations (both water and carbon dioxide) are located outside both entrances to the control room.

In areas that are compartmentalized, hose stations are typically located outside the entrances to the compartments. In other areas, hose stations are located near stairwells.

Since the hose stations serving compartmentalized areas are located outside the compartments, shutoff valves in the associated standpipes are also located outside the compartments. All headers supplying hose stations can be isolated near their connection to the yard fire main loop. Pressure-reducing devices are not used in the fire protection water supply system.

Item 117

Appendix A Guideline

The proper type of hose nozzles to be supplied in each area should be based on the fire hazard analysis. The usual combination spray/straight-stream nozzle may cause unacceptable mechanical damage (for example, the delicate electronic equipment in the control room) and be unsuitable. Electrically safe nozzles should be provided at locations where electrical equipment or cabling is located.

LGS Design

Combination-type nozzles will be installed on the wet standpipe hose stations for flexibility. The fire brigade training will stress the proper use of combination nozzles on fires involving energized electrical equipment. Since Class A combustibles may be present from time to time, and often require a straight stream for effective extinguishment, it is desirable to have adjustable nozzles with straight stream capability provided at strategic locations rather than one specific nozzle type.

Item 118

Appendix A Guideline

Certain fires such as those involving flammable liquids respond well to foam suppression. Consideration should be given to use of any of the available foams for such specialized protection application. These include the more common chemical and mechanical low expansion foams, high expansion foam and the relatively new aqueous film forming foam (AFFF).

LGS Design

Flammable liquids used in the plant include fuel oils, lubricating oils, and solvents. The solvents used in maintenance operations are not stored inside buildings containing safety-related equipment. Buried tanks are used for diesel-generator fuel oil storage. Aboveground storage tanks are used for No. 2 and No. 6 fuel oil for the auxiliary boiler, and are provided with mechanical foam extinguishing systems. The fuel tank for the diesel-driven fire pump is surrounded by a concrete curb and is located inside the diesel fire pump enclosure. The tank and pump are protected by an automatic wet pipe sprinkler system. Other than integral systems, lubricating oil systems and storage facilities are protected by automatic sprinklers with portable dry chemical extinguishers and hose stations available for initial attack and backup.

Flammable liquid fires are effectively controlled by water spray delivered by hose streams or automatic sprinklers. Although foam suppression is very effective for flammable liquid fires, NFPA 11B does not recommend its use on hot oil fires due to the possibility of frothing.

Item 119

Appendix A Guideline

The use of Halon fire extinguishing agents should as a minimum comply with the requirements of NFPA 12A and 12B, "Halogenated Fire Extinguishing Agent Systems - Halon 1301 and Halon 1211." Only UL or FM approved agents should be used.

In addition to the guidelines of NFPA 12A and 12B, preventative maintenance and testing of the systems, including check weighing of the Halon cylinders should be done at least quarterly.

Particular consideration should also be given to:

(a) minimum required Halon concentration and soak time

(b) toxicity of Halon

(c) toxicity and corrosive characteristics of thermal decomposition products of Halon.

LGS Design

A total flooding Halon 1301 system is provided for the entire raised floor of the auxiliary equipment room at elevation 289 feet in the control structure. The system design and installation is in accordance with NFPA 12A.

Administrative procedures will be established to provide for maintenance and testing of the system, including check weighing of the Halon cylinders, to be performed at least quarterly.

(a) The design concentration for the Halon 1301 system is 20% with a 20 minute soak time.

(b) The Halon 1301 system is provided only under the raised floor of the auxiliary equipment room, rather than in the entire room. Emergency procedures will require personnel to use self-contained breathing apparatus when entering the auxiliary equipment room following the discharge of Halon.

(c) The Halon 1301 system is designed to achieve a concentration of 6% within the first 10 seconds after discharge begins. This concentration is sufficient to extinguish the flames, which will largely end the production of toxic gases as a result of the thermal decomposition of Halon. Thus, rapid extinguishment of the flames will prevent the production of a significant quantity of toxic gases.

Item 120

Appendix A Guideline

The use of carbon dioxide extinguishing systems should as a minimum comply with the requirements of NFPA 12, "Carbon Dioxide Extinguishing Systems."

Particular consideration should also be given to:

(a) minimum required CO_2 concentration and soak time:

(b) toxicity of CO_2;

(c) possibility of secondary thermal shock (cooling) damage;

(d) offsetting requirements for venting during CO_2 injection to prevent overpressurization versus sealing to prevent loss of agent;

(e) design requirements from overpressurization; and

(f) possibility and probability of CO_2 systems being out of service because of personnel safety consideration. CO_2 systems are disarmed whenever people are present in an area so protected. Areas entered frequently (even though duration time for any visit is short) have often been found wtih CO_2 systems shut off.

LGS Design

A low pressure, total flooding CO_2 system is provided for the cable spreading rooms. The system design and installation is in accordance with NFPA No. 12.

(a) The design concentration for the CO_2 system is 50%, achieved within 7 minutes.

(b) The protected space is normally unoccupied. The emergency procedures will require personnel to use breathing apparatus when entering the space following carbon dioxide discharge.

(c) CO_2 discharge will be directed so as not to impinge directly on any cables.

(d) Automatic initiation of the system closes the steam flooding dampers in the ventilation ducts which penetrate the cable spreading room walls.

(e) Leakage around the doors leading into the cable spreading rooms will prevent overpressurization of the rooms due to the carbon dioxide discharge.

(f) The electric power circuit for the CO_2 system is supervised, and causes alarm registry in the control room when the circuit is interrupted.

A supervised 1/4-inch ball valve is provided in the CO_2 system. This valve is provided with a limit switch which activates a local alarm and is annunciated in the control room.

The audible predischarge alarm provides ample time for personnel to evacuate the area. Routine inspections and maintenance activities can be safely made in the cable spreading room area without disarming the system. The periodic inspection and testing of the ionization smoke detectors can be safely made, since the automatic actuation of the carbon dioxide system is initiated by thermal fire detectors.

Additionally, local stations and controls are provided near the CO_2 bulk storage unit to permit, under administrative procedures, the isolation of the CO_2 bulk storage unit by a valve normally locked in the open position, and/or permit operation of the CO_2 total flooding system independent of automatic controls and, if necessary, without electric power.

Item 124

Appendix A Guideline

Because of the general inaccessability of these areas during normal plant operations, protection should be provided by automatic fixed systems. Automatic sprinklers should be installed for those hazards identified as requiring fixed suppression.

LGS Design

The secondary containment is accessible during all modes of normal plant operations. Therefore, fire suppression for most areas of the secondary containment is provided by manual hose stations and portable fire extinguishers. Areas with significant concentrations of combustible materials have been provided with fixed suppression systems (the HPCI and RCIC pump compartments are provided with pre-action sprinkler systems, electrical penetration areas at elevations 253 and 283 feet are provided with wet pipe sprinkler systems, and charcoal filters are provided with water spray systems).

Fire suppression coverage for the primary containment is provided by manual hose stations and portable fire extinguishers located outside the two entrances to the suppression chamber at elevation 217 feet and the two entrances to the drywell at elevation 253 feet.

Item 127

Appendix A Guideline

A primary containment general area fire detection capability should be provided as backup for the above-described hazard detection. To accomplish this, suitable smoke detection (e.g., visual obscuration, light scattering, and particle counting) should be installed in the air recirculation system ahead of any filters.

LGS Design

Fire detectors are not provided inside the primary containment. During reactor operation, the primary containment is inerted with nitrogen, and the oxygen concentration is maintained below 5% by volume. This inert atmosphere will prevent fires from occurring in the primary containment. Administrative procedures provide for fire watches when necessary during maintenance operations when the drywell has been de-inerted.

Item 128

Appendix A Guideline

In addition, manual fire fighting capability should be permanently installed in containment. Standpipes with hose stations, and portable fire extinguishers, should be installed at strategic locations throughout containment for any required manual fire fighting operations.

Equivalent protection from portable systems should be provided if it is impractical to install standpipes with hose stations.

LGS Design

There are no provisions for permanently installed fire suppression within the primary containment. Manual hose stations and portable fire extinguishers are installed at locations throughout the secondary containment, including locations near the entrances to the primary containment.

The extension of the standpipe system into the primary containment is not recommended nor is the permanent installation of portable extinguishers.

Item 130

Appendix A Guideline

The control room is essential to safe reactor operation. It must be protected against disabling fire damage and should be separated from other areas of the plant by floors, walls, and roof having minimum fire resistance ratings of three hours.

LGS Design

The walls, floor, and ceiling of the control room are rated as 3-hour fire barriers. The two entrances are provided with 3-hour rated doors, ventilation ducts entering the room are provided with 3-hour rated fire dampers, and all other penetrations are provided with 3-hour rated seals.

The walls and ceilings separating the control room proper from its support facilities (such as office, shop, toilet, utility room, and instrument laboratory) are rated as 1-hour fire barriers. Ventilation ducts serving these support facilities are provided with 1-hour rated fire dampers, and the entrances to the individual rooms are provided with C-label (3/4 hour) doors.

Item 131

Appendix A Guideline

Control room cabinets and consoles are subject to damage from two distinct fire hazards:

(a) Fire originating within a cabinet or console; and

(b) Exposure fire involving combustibles in the general room area.

Manual fire fighting capability should be provided for both hazards. Hose stations and portable water and Halon extinguishers should be located in the control room to eliminate the need for operators to leave the control room. An additional hose piping shutoff valve and pressure-reducing devices should be installed outside the control room.

Hose stations adjacent to the control room with portable extinguishers in the control room are acceptable.

Nozzles that are compatible with the hazards and equipment in the control room should be provided for the manual hose station. The nozzles chosen should satisfy actual fire fighting needs, satisfy electrical safety, and minimize physical damage to electrical equipment from hose stream impingement.

LGS Design

Portable carbon dioxide fire extinguishers are located in the control room. In addition, manual hose stations of both the carbon dioxide and water types are located outside both entrances to the control room. The water hoses are equipped with combination nozzles. No hose stations are located within the control room.

Item 132

Appendix A Guideline

Fire detection in the control room, cabinets, and consoles should be provided by smoke and heat detectors in each fire area. Alarm and annunciation should be provided in the control room. Fire alarms in other parts of the plant should also be alarmed and annunciated in the control room.

LGS Design

Fire detectors are not located inside the individual cabinets and consoles in the control room. The control room panels are not gasketed and therefore are not airtight. Any smoke generated within the cabinets will leak out and be detected by the fire detectors in the control room. Twenty-three detectors are distributed throughout the control room to provide rapid detection of smoke originating in any panel. Actuation of any of these detectors is annunciated on the fire protection panels in the control room. The indicator light on the detector itself will then identify the specific detector originating the alarm.

Fire alarms from other areas in the plant are also annunciated on the fire protection panels in the control room.

Item 135

Appendix A Guideline

The control room ventilation intake should be provided with smoke detection capability to automatically alarm locally and isolate the control room ventilation system to protect operators by preventing smoke from entering the control room. Manually operated venting of the control room should be available so that operators have the option of venting for visibility.

LGS Design

The control room ventilation intake is provided with smoke detection capability to automatically detect and alarm the presence of smoke. Upon receipt of the alarm, the control room ventilation system can be manually placed in the recirculation mode in order to isolate the control room from the outside.

For purge operation of the control room ventilation system the outside supply air and exhaust air dampers are fully opened and the return air damper to the control room is closed. The control room purge system can be operated from both inside and outside the control room.

The control room ventilation system is a safety-related system. Automatic actuation of the recirculation mode by means of a non-safety-related signal is not permitted based on the separation criterion applicable to safety-related equipment.

Item 138

Appendix A Guideline

The preferred acceptable methods are:

1. Automatic water system such as closed head sprinklers, open head deluge, or open directional spray nozzles. Deluge and open spray systems should have provisions for manual operation at a remote station; however, there should also be provisions to preclude inadvertent operation. Location of sprinkler heads or spray nozzles should consider cable tray sizing and arrangements to assure adequate water coverage. Cables should be designed to allow wetting down with deluge water without electrical faulting. Open head deluge and open directional spray systems should be zoned so that a single failure will not deprive the entire area of automatic fire suppression capability. The use of foam is acceptable, provided it is of a type capable of being delivered by a sprinkler or deluge system, such as an Aqueous Film Forming Foam (AFFF).

LGS Design

Automatic fire protection for the cable spreading room is provided by a total flooding carbon dioxide extinguishing system, in lieu of water or foam systems. The design of the carbon dioxide system is discussed in Section 2.8.

In addition to the heat detectors provided for actuation of the carbon dioxide system, a separate group of fire detectors is located in the cable spreading room to provide early warning of an incipient fire.

Item 156

Appendix A Guideline

The general area housing remote safety-related panels should be provided with automatic fire detectors that alarm locally and alarm and annunciate in the control room. Combustible materials should be controlled and limited to those required for operation. Portable extinguishers and manual hose stations should be provided.

LGS Design

All safety-related panels are located in the control room and auxiliary equipment room except for the containment hydrogen recombiner power cabinets and the containment combustible gas sample cabinets, which are located in the reactor exclosure. The remote shutdown panel is located in the auxiliary equipment room. Other safety-related instrumentation is located in open racks and not within enclosed panels.

The safety-related panel areas in the auxiliary equipment room are provided with automatic smoke detectors with local alarm as well as annunciation in the control room. The auxiliary equipment room will be used for electrical equipment only and not for any other purpose.

Portable fire extinguishers and hose stations are available for general areas housing safety-related panels and racks.

Item 157

Appendix A Guideline

Battery rooms should be protected against fire explosions. Battery rooms should be separated from each other and other areas of the plant by barriers having a minimum fire rating of three hours inclusive of all penetrations and openings. (See NFPA 69, "Standard on Explosion Prevention systems.")

LGS Design

All battery rooms (both the safety-related battery rooms in the control structure and the non-safety-related battery rooms in the turbine enclosure) are individually enclosed by fire walls with minimum ratings of 3 hours. Ceilings above and floors below the battery rooms are capable of 3-hour fire ratings with the exception of exposed structural steel supporting the concrete slabs.

Item 158

Appendix A Guideline

Ventilation systems in the battery rooms should be capable of maintaining the hydrogen concentration well below 2 vol. % hydrogen concentration.

LGS Design

Ventilation air for the safety-related battery rooms is supplied by the safety-related OAV118 and OBV118 fan cabinets, and is exhausted by the nonsafety-related OAV124 and OBV124 fan cabinets. Both sets of fans are 100% redundant and are controlled such that the standby fan will start running automatically if the lead fan fails. In the event of loss of flow through the battery room exhaust ducts, due either to fan stoppage or isolation damper closure, the battery room exhaust will automatically be recirculated to the suction of the OAV118 and OBV118 fan cabinets. The ventilation flow rate through the battery rooms provides 12 air changes per hour, which maintains hydrogen concentration far below 2% by volume.

Ventilation air for the nonsafety-related battery rooms is provided by the turbine enclosure air supply and air exhaust systems, which are non-safety-related. A hydrogen monitor continuously samples the air in the battery rooms; high hydrogen concentration is annunciated in the control room. The low rate at which hydrogen builds up in the battery rooms provides ample time for the operators to take corrective action.

Item 164

Appendix A Guideline

Drainage for fire fighting water and means for local manual venting of smoke should be provided.

LGS Design

Each diesel-generator cell is provided with trapped and vented floor drains with adequate drainage capacity to cope with the maximum sprinkler water flow in each room.

Each diesel-generator cell is provided with two exhaust fans, each capable of 40 air changes per hour for cooling and/or smoke removal. The ventilation system is controlled manually from a local control panel and is also started automatically by either high air temperature or a diesel engine start signal.

Item 167

Appendix A Guideline

The enclosure should be protected by automatic fire suppression systems such as AFFF or sprinklers.

LGS Design

The diesel oil day tank and the lube oil tank are installed within a 3-hour rated enclosure located inside each diesel-generator room. A pre-action sprinkler system is provided for the diesel-generator room and the day tank enclosure.

Item 168

Appendix A Guideline

Diesel fuel oil tanks with a capacity greater than 1100 gallons should not be located inside the buildings containing safety-related equipment. They should be located at least 50 feet from any building containing safety-related equipment, or if located within 50 feet, they should be housed in a separate building with construction having a minimum fire resistance rating of three hours. Buried tanks are considered as meeting the three-hour fire resistance requirements. See NFPA 30, "Flammable and Combustible Liquids Code", for additional guidance.

LGS Design

The plant has eight diesel fuel oil storage tanks, each with a capacity of 41,500 gallons. The tanks are buried underground away from buildings.

Item 171

Appendix A Guideline

Pump houses and rooms housing safety-related pumps or other safety-related equipment should be separated from other areas of the plant by fire barriers having at least three-hour ratings. These rooms should be protected by automatic sprinkler protection unless a fire hazards analysis can demonstrate that a fire will not endanger other safety-related equipment required for safe plant shutdown.

LGS Design

The safety-related pump compartments located at elevation 177 feet in the reactor enclosure are separated from each other and from other areas of the plant by 3-hour rated fire walls. The spray pond pump structure is located remote from other plant structures, and the two divisions of pumps within the structure are separated by a 3-hour rated fire wall.

The HPCI pump compartment and the RCIC pump compartment are protected by automatic pre-action sprinkler systems. Fires originating in other safety-related pump compartments would not endanger other safety-related equipment required for safe plant shutdown, as discussed in Section 5.0.

Item 180

Appendix A Guideline

The storage area should be provided with a drainage system to preclude accumulation of water.

LGS Design

A 4-inch floor drain serves to collect water on the refueling floor in the vicinity of the new fuel storage vault. A curb around the top of the vault prevents water on the refueling floor from draining into the vault. A 4-inch floor drain at the bottom of the new fuel storage vault prevents water from accumulating there.

Item 181

Appendix A Guideline

The storage configuration of new fuel should always be so maintained as to preclude criticality for any water density that might occur during fire water application.

LGS Design

The new fuel storage racks are designed to preclude the possibility of a fuel assembly being placed in an abnormal position that would increase the reactivity of the array. Based on criticality analyses performed by the fuel and storage rack vendor, the spray density ranges of fire fighting devices are well below the ranges which could result in new fuel criticality. In addition, a cover is provided over the top of the new fuel storage vault to prevent fire fighting water from inadvertently impinging on the fuel.

Item 185

Appendix A Guideline

Automatic sprinklers should be used in all areas where combustible materials are located.

LGS Design

An automatic wet pipe sprinkler system is provided for the waste drum storage area at elevation 217 feet in the radwaste enclosure. Hose stations and portable fire extinguishers are provided for fire suppression coverage of the remainder of the radwaste enclosure.

Item 186

Appendix A Guideline

Automatic fire detection should be provided to annunciate and alarm in the control room and alarm locally.

LGS Design

Automatic fire detection is provided in limited areas of the radwaste enclosure, as shown in Table A-1. In consideration of the low combustible loading in the remaining areas of the radwaste enclosure, detection by personnel in the vicinity is deemed sufficient.

Item 189

Appendix A Guideline

The decontamination areas should be protected by automatic sprinklers if flammable liquids are stored.

LGS Design

No flammable liquids are stored in decontamination areas. Fire suppression coverage is provided by hose stations and portable fire extinguishers.

Item 195

Appendix A Guideline

Cooling towers should be of noncombustible construction when the basins are used for the ultimate heat sink or for the fire protection water supply.

LGS Design

The cooling tower basins serve as a source of water for the fire protection system but not for any safety-related systems. The cooling towers are constructed entirely of non-combustible material except for the splash bars and drift eliminators, which are polyvinyl chloride, and the splash bar support grids, which are fire retardant polyester and fiberglass. The fill material is contained in a ring-shaped area around the periphery of each tower. The ring is separated into six cells by fire walls located at 60° intervals. A fire occurring in any one cell would have no effect on safety-related structures or systems, since such a fire would not affect the structural integrity of the cooling tower and the towers are located away from safety-related structures. This arrangement has been accepted by ANI for design of cooling towers with PVC and polyester fill material and without fire protection sprinklers.

Item 207

Apprendix A Guideline

Hazardous chemicals should be stored and protected in accordance with the recommendatons of NFPA 49, "Hazardous Chemicals Data." Chemicals storage areas should be well-ventilated and protected against flooding conditions since some chemicals may react with water to produce ignition.

LGS Design

Hazardous chemicals are stored in areas that are remote from safety-related areas, are well ventilated, and are protected against flooding. The controls and precautions relative to hazardous chemicals to be commonly used in the plant will be set forth in the administrative procedures.

Hazardous chemicals will be transported in the usual shipping containers, stored in suitable areas. Protection, separation, and isolation criteria will be followed in accordance with the recommendations of NFPA 49, "Hazardous Chemical Data."

The ventilation system provided for the chemical storage areas will assure that the toxicity level and potentially explosive gaseous mixtures in these areas meet the requirements of NFPA 49.

Adequate drainage will be provided.

CHAPTER 4

EVALUATION OF POTENTIAL FIRE HAZARDS

4.1 SCOPE OF EVALUATION

This chapter provides an evaluation of the potential for occurrence of fires within the plant and a summary of the capabilities of the existing fire protection program. This evaluation was performed for all structures that contain safety-related equipment or could affect safety-related structures by virtue of the fire hazards present.

A review of the plant was made to identify the combustible materials present, quantify the fire hazard in terms of combustible loading, and relate the potential hazard to the capabilities of the existing fire barriers and fire suppression systems. This information is presented in Table A-1 which lists the type and quantity of combustible materials present in each fire zone, the corresponding combustible loading, and the availability of detection and suppression equipment. Figures B-4 through B-12 show the locations of the fire zones, fire barriers, and fire suppression coverage.

4.2 PROCEDURE

The evaluation of fire hazards was performed using a procedure that is summarized by the following steps:

a. For identification purposes, the various structures of the plant were divided into specific fire areas. A fire area is defined as that portion of a structure that is separated from other areas by boundaries (walls, floors, and ceilings) which are of a type of construction which is sufficient to prevent the spread of fire across the boundary, considering the combustible loading in the area. Many fire areas were further subdivided into fire zones to permit more precise identification of the locations of combustible materials, fire detection and suppression systems, and components associated with safety-related systems. The breakdown into fire zones was based on the locations of interior walls and slabs within each fire area. Fire areas are identified by a unique number, and fire zones within the same fire area are identified by a subletter. The fire area and fire zone designations are listed in Table A-1 under "Item No.".

b. Each fire zone was surveyed to determine the type, quantity, and distribution of combustible materials present.

c. The combustible loading for each fire zone is determined based on the quantity of combustible materials present and the heat of combustion of each type of combustible material. The heat of combustion values used in this analysis are listed in Table A-2. The quantity of each type of combustible material (in lb) is multiplied by the appropriate heat of combustion (in Btu/lb) to determine the heat release (in Btu) of each type of combustible material. The total heat release of all combustibles in the fire zone is then expressed in terms of the weight of equivalent wood by dividing by the heat of combustion of wood (8000 Btu/lb). To obtain the combustible loading (in lb of equivalent wood per square foot of floor area) for each fire zone, the total heat release (in lb of equivalent wood) is divided by the floor area of the fire zone. The combustible loading thus obtained is listed in Table A-1.

d. The next step was to determine the adequacy of the building components in limiting the propagation of an uncontrolled postulated fire. For this analysis the combustibles in an area were categorized from A-slight through E-severe in accordance with National Fire Protection Handbook, Fourteenth Edition, Table 6-8C. Battery cases were placed in the A-slight category. Charcoal and electrical cabling were both placed in the C-moderately severe category. All combustible liquids were placed in the E-severe category. In general, if the distribution of the combustible material in the area being considered was nonuniform, a more severe category was selected than would have been warranted by homogeneous material distribution. In analyzing fire zones that contained combustible liquids, it was assumed that the entire contents of the liquid reservoir in the particular zone was distributed uniformly over the floor area of the zone unless limited by curbs or other architectural features. It was then assumed that the liquid was ignited and burned at a rate of 4 mm/min. This method of analysis represents a conservative approach since it will generate the maximum heat release rate and thus minimize the effectiveness of the plant fire brigade in reducing fire damage.

National Fire Protection Handbook, Figure 6-8E was then utilized to determine the expected duration of the fully developed period of the fire. In certain cases where significant quantities of combustibles in different occupancy categories were present, interpolation between time-temperature curves was used to yield a realistic expected duration.

To establish the adequacy of fire area boundaries, an equivalent fire severity was then determined. The area under the time-temperature curve for each occupancy category was compared to the National Bureau of Standards Time-Temperature Curve. This normalization process yields an equivalent fire severity in minutes. For example, a fire loading of 4 psf in an A-slight area will have an expected duration of 96 minutes but an equivalent severity of 50 minutes. The same loading in a C-moderately severe area will have an expected duration of 34 minutes and equivalent severity of 22 minutes.

The equivalent fire severity thus determined is listed in Table A-1.

CHAPTER 5

ANALYSIS OF CAPABILITY TO ACHIEVE SAFE SHUTDOWN

5.1 METHODOLOGY

This chapter provides an evaluation of the effects of postulated fires in each fire area on the ability of the operator to achieve a safe shutdown of the plant. Of the numerous possible combinations of equipment that could be used to effect a safe shutdown, two specific conbinations were selected for detailed study for the purposes of this evaluation. These two shutdown methods are described in Section 5.2.

In performing the safe shutdown analysis, the two shutdown methods were examined to determine the minimum equipment, control, and power requirements for operability of each method. The locations of the equipment itself and the cabling associated with the required equipment were identified with respect to the various fire areas.

Each fire area was then examined to determine which components associated with the shutdown methods, if any, would be rendered inoperable by the occurrence of a fire within the fire area. The results of the safe shutdown analysis are summarized in Sections 5.3 through 5.9 for each fire area.

The following assumptions were used in performing the safe shutdown analysis:

a. No credit is taken for manual fire fighting efforts or the operation of automatic fire suppression systems. The fire is assumed to disable all equipment and electrical cabling located in the fire area, unless the fire hazard analysis demonstrates otherwise. An electrical cable tray fire is assumed not to propagate from one tray to another, provided that no combustible pathways exist between the trays, and the trays are physically separated by a sufficient distance considering the combustible loading in the area.

b. Plant accidents and severe natural phenomena are not considered to occur concurrently with the postulated fire. However, offsite power is assumed to be unavailable after the onset of the fire.

c. A single active component failure is not assumed to occur concurrently with the fire.

d. Credit is taken for reactor trip. Any fire affecting the reactor protection system or the control rod drive circuitry will not prevent the reactor from being tripped. A reactor trip can be performed manually (in the control room), automatically (by the RPS logic), or by tripping the RPS power supplies (in the auxiliary equipment room).

e. No credit is taken for proper operation or proper positioning of equipment which is not required to change its status during the course of the shutdown procedure (e.g., a motor-operated valve). If control or power cabling associated with such equipment is routed through a fire area under consideration, loss of operability and loss of function is assumed. This assumption provides a worst case analysis regarding spurious signals associated with cabling failures in a fire area.

Those floor slabs identified by an asterisk following the indicated fire rating in the fire area discussions contained in Sections 5.3 through 5.9 are discussed in Item 46 of Section 3.2. Those watertight and steamtight doors identified in Sections 5.3 through 5.9 by a double asterisk (**) following the indicated fire rating are discussed in Item 47 of Section 3.2.

5.2 DESCRIPTION OF REACTOR SHUTDOWN METHODS

The following sections provide descriptions of methods that can be used for reactor shutdown and cooldown from the control room, both with and without offsite power, and also from outside the control room using the remote shutdown panel. Each of these methods includes a system by which makeup water can be added to the reactor vessel, a system by which energy can be removed from the reactor vessel, and any support systems needed to accommodate energy removal to an ultimate heat sink or to return water to its supply source.

Although the safe shutdown analysis for the various fire areas places primary emphasis on achievement of reactor shutdown using the methods described below, many alternative shutdown methods would be available. Use of safety-related and nonsafety-related systems not addressed in the safe shutdown analysis, plus manual operation of certain equipment and controls, would provide numerous combinations of systems with adequate capability to safely shut the plant down.

5.2.1 Reactor Shutdown With Offsite Power

After the turbine-generator has been tripped and all control rods inserted into the reactor core during the course of a normal shutdown and cooldown, reactor decay heat and sensible heat is removed by bypassing main steam to the condenser. Heat is removed from the condenser by the circulating water system and rejected to the atmosphere by the cooling tower. Makeup water is supplied to the reactor vessel by the condensate and feedwater system, taking suction on the condenser hotwell. When the reactor has been depressurized below a nominal 75 psig, the RHR system is initiated in the shutdown cooling mode of operation. In this mode, reactor water is circulated through the RHR heat exchangers, where it is cooled by the RHRSW system. Heat is rejected from the RHRSW system to the atmosphere by using either the cooling tower or the spray pond. The reactor vent valves are opened when reactor pressure reaches atmospheric.

5.2.2 Reactor Shutdown Without Offsite Power

For the purposes of this safe shutdown analysis, two methods of shutdown that are operable without offsite power were selected for detailed study. Shutdown method A requires Class IE power from Divisions 1 and 3 (both ac and dc) in order to be operable. Shutdown method B requires Class IE power from Divisions 2 and 4 (both ac and dc) plus dc power from either Division 1 or Division 3 in order to be operable. The two methods are described below.

Method A

After closure of the main steam isolation valves, the RCIC system is used to supply makeup water to the reactor vessel from the suppression chamber. The operation of the RCIC system also removes energy from the reactor in the form of steam used to drive the RCIC turbine. During the period in which steam is generated at a rate greater than the consumption of the RCIC system, steam is relieved to the suppression pool by the automatic actuation of the main steam relief valves, which open when reactor pressure reaches the valve setpoint. Heat is removed from the suppression pool by operating one loop of the RHR system in the suppression pool cooling mode. In this mode, water from the suppression pool is circulated through an RHR heat exchanger and then returned to the suppression pool. In order to initiate operation of the shutdown cooling mode of the RHR system, it is necessary to depressurize the reactor below a nominal pressure of 75 psig. This is accomplished by using the ADS valves to discharge steam to the suppression pool. When the reactor has been depressurized below 75 psig, operation of the RCIC system is terminated and the RHR system is switched from the suppression pool cooling mode to the shutdown cooling mode. In both of these modes, heat is removed from the RHR heat exchanger by the RHRSW system, which in turn dissipates heat at the spray pond. The shutdown cooling mode of RHR will maintain the reactor in a cold shutdown condition.

The items of equipment that are required for this shutdown method include the following:

a. Main steam relief valves (self-actuated mode only)

b. ADS valves (If a compressed gas supply is needed in addition to that stored in the ADS accumulators, the compressed gas cylinders of the primary containment instrument gas system will provide the necessary gas. If the outboard containment isolation valve on the gas supply line cannot be opened by its motor operator, the valve will be opened manually.)

c. RCIC pump and associated valves

d. RHR heat exchanger "A"

e. RHR pump "A" and associated valves (The outboard isolation valve on the shutdown cooling return line is a motor-operated valve powered from the Division 2 switchgear; this valve will be operated manually at the valve location if Division 2 power is not available.)

f. RHR shutdown cooling suction isolation valves (The outboard valve is a motor-operated valve powered from the Division 2 switchgear; this valve will be operated manually at the valve location if Division 2 power is not available.)

g. RHRSW pump "A" and associated valves (for Unit 1); RHRSW pump "C" and associated valves (for Unit 2)

h. ESW pump "A" and associated valves (for Unit 1); ESW pump "C" and associated valves (for Unit 2)

i. RHR compartment unit cooler "A"

j. RCIC compartment unit cooler "A"

k. Spray pond pump structure fan "A"

l. Diesel-generator enclosure fans "A", "C", "E", and "G"

m. Reactor vessel pressure and level recorder "A"

n. Standby diesel-generators "A" and "C"

o. Station batteries "A" and "C"

Method B

After closure of the main steam isolation valves, the HPCI system is used to supply makeup water to the reactor vessel from the suppression chamber. The operation of the HPCI system also removes energy from the reactor in the form of steam used to drive the HPCI turbine. During the period in which steam is generated at a rate greater than the consumption of the HPCI system, steam is relieved to the suppression pool by the automatic actuation of the main steam relief valves, which open when reactor pressure reaches the valve setpoint. Heat is removed from the suppression pool by operating one loop of the RHR system in the suppression pool cooling mode. In this mode, water from the suppression pool is circulated through an RHR heat exchanger and then returned to the suppression pool. In order to initiate operation of the shutdown cooling mode of the RHR system, it is necessary to depressurize the reactor below a nominal pressure of 75 psig. This is accomplished by using the ADS valves to discharge steam to the suppression pool. When the reactor has been depressurized below 75 psig, the RHR system is switched from the suppression pool cooling mode to the shutdown cooling mode. Heat is removed from the RHR heat exchanger by the RHRSW system, which in turn dissipates heat at the spray pond. The shutdown cooling mode of RHR will maintain the reactor in a cold shutdown condition.

The items of equipment that are required for this shutdown method include the following:

a. Main steam relief valves (self-actuated mode only)

b. ADS valves (If a compressed gas supply is needed in addition to that stored in the ADS accumulators, the compressed gas cylinders of the primary containment instrument gas system will provide the necessary gas. If the outboard containment isolation valve on the gas supply line cannot be opened by its motor operator, the valve will be opened manually.)

c. HPCI pump and associated valves

d. RHR heat exchanger "B"

e. RHR pump "B" and associated valves

f. RHR shutdown cooling suction isolation valves (The inboard valve is a motor-operated valve powered from the Division 1 switchgear; this valve will be operated manually at the valve location if Division 1 power is not available.)

g. RHRSW pump "B" and associated valves (for Unit 1);

RHRSW pump "D" and associated valves (for Unit 2)

h. ESW pump "B" and associated valves (for Unit 1); ESW pump "D" and associated valves (for Unit 2)

i. RHR compartment unit cooler "B"

j. HPCI compartment unit cooler "A"

k. Spray pond pump structure fan "B"

l. Diesel-generator enclosure fans "B", "D", "F", and "H".

m. Reactor vessel pressure and level recorder "B"

n. Standby diesel-generators "B" and "D"

o. Station batteries "B" and "D" plus either the "A" or "C" batteries

5.2.3 Reactor Shutdown from Outside the Control Room

In the unlikely event that the control room becomes uninhabitable, the plant can be shut down from the remote shutdown panel, located in the auxiliary equipment room. Transfer switches on the remote shutdown panel allow the operator to transfer control of the systems involved from the control room panels to the remote shutdown panel. Instrumentation and controls for the following systems are provided on the remote shutdown panel:

a. RCIC

b. Main steam relief valves "A", "C", and "N"

c. RHR loop "A"

d. RHRSW loop "A"

e. ESW loop "A"

f. Reactor vessel and containment monitoring

5.3 SAFE SHUTDOWN ANALYSIS - CONTROL STRUCTURE

5.3.1 Fire Area 1: Recombiner Compartments, Condensate Backwash Compartments, and Control Structure Water Chiller Areas (El. 180'-0" and 200'-0")

(a) Structural and architectural design features of fire area (see Figures B-4 and B-5):

	Construction	Rating
Walls:	W - Reinforced concrete	3 hr
	N - Reinforced concrete (part)	3 hr
	N - Reinforced concrete (part adjacent to stairwell no. 7)	2 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete (part below El. 200'-0")	3 hr
	S - Concrete masonry unit (part above El. 200'-0", eastern half)	3 hr
	S - Concrete masonry unit (part above El. 200'-0", western half, contains two HVAC penetrations without fire dampers)	None
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete	3 hr*
Access:	Steamtight door connecting to stairwell no. 7	1.5 hr**
	Doors connecting to areas 89 and 102	3 hr

(b) Major safety-related components in fire area:

(1) Control structure water chillers OAK112 and OBK112
(2) Control structure chilled water circulation pumps OAP162 and OBP162

(c) Postulated fire in area:

Ignition of electrical cabling in cable trays. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

(1) Loss of control structure chilled water system loop A or loop B

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, complete loss of either loop of the control structure chilled water system may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safety shut the plant down.

Due to the provision of fire walls at El. 200'-0" within fire area 1, a postulated fire cannot affect both loops of the control structure chilled water system simultaneously. A 3-hour rated fire wall is located between the loop A and loop B control structure water chiller areas, and the north, south, and east walls of the loop B water chiller area are also fire rated. Therefore, at least one of the chilled water loops will remain available to provide cooling for the control structure in the event of a fire in this area.

5.3.2 Fire Area 2: 13-kV Switchgear Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Concrete masonry unit - (part adjacent to battery rooms)	3 hr
	E -	Reinforced concrete - (remainder)	3 hr
	S -	Reinforced concrete	3 hr
	W -	Reinforced concrete (part)	3 hr
	W -	Concrete masonry unit (part adjacent to battery rooms)	3 hr
	W -	Reinforced concrete (part adjacent to stairwell no. 7)	2 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr*

Access:	Door connecting to stairwell no. 7	1.5 hr
	Doors connecting to areas 3, 4, 5, and 6	3 hr
	Steamtight doors connecting to areas 94, 107, and 113	3 hr**

(b) Major safety-related components in fire area:

(1) Emergency switchgear and battery room fan cabinets OAV118 and OBV118 and associated ventilation dampers

(2) Rigid steel conduits containing cables associated with the following Unit 1 components:

a. Class IE dc motor control centers 10D201 (Div. 1), 10D202 (Div. 2), and 10D203 (Div. 2)

b. Class IE dc distribution panels 1CD102 (Div. 3), 1DD102 (Div. 4), 1AD501 (Div. 1), 1BD501 (Div. 2), 1CD501 (Div. 3), and 1DD501 (Div. 4)

c. Class IE instrument ac transformers 10X106 (Div. 1), 10X107 (Div. 2), 10X108 (Div. 3), and 10X109, (Div. 4)

(3) Rigid steel conduits containing cables associated with the following Unit 2 components:

a. Class IE dc motor control centers 20D201 (Div. 1), 20D202 (Div. 2), and 20D203 (Div. 2)

b. Class IE dc distribution panels 2CD102 (Div. 3), 2DD102 (Div. 4), 2AD501 (Div. 1), 2BD501 (Div. 2), 2CD501 (Div. 3), and 2DD501 (Div. 4).

(4) Rigid steel conduits containing cables associated with HVAC dampers in the battery room exhaust ducts

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Unit 1 systems

a. Loss of Unit 1 Class IE dc power supplied by motor control centers 10D201 (Div. 1), 10D202 (Div. 2), and 10D203 (Div. 2)

b. Loss of Unit 1 Class IE dc power supplied by distribution panels 1CD102 (Div. 3), 1DD102 (Div. 4), 1AD501 (Div. 1), 1BD501 (Div. 2), 1CD501 (Div. 3), and 1DD501 (Div. 4)

c. Loss of Unit 1 Class IE ac power supplied by instrument ac distribution panels 10Y101 (Div. 1), 10Y102 (Div. 2), 10Y103 (Div. 3), and 10Y104 (Div. 4)

d. Loss of diesel-generators 1A, 1B, 1C, and 1D

e. Loss of the Div. 3 and Div. 4 4-kV switchgear

(2) Unit 2 systems

a. Loss of Unit 2 Class IE dc power supplied by motor control centers 20D201 (Div. 1), 20D202 (Div. 2), and 20D203 (Div. 2)

b. Loss of Unit 2 Class IE dc power supplied by distribution panels 2CD102 (Div. 3), 2DD102 (Div. 4), 2AD501 (Div. 1), 2BD501 (Div. 2), 2CD501 (Div. 3), and 2DD501 (Div. 4)

c. Loss of Unit 2 Class IE ac power supplied by instrument ac distribution panels 20Y102 (Div. 1), 20Y102 (Div. 2), 20Y103 (Div. 3), and 20Y104 (Div. 4)

d. Loss of diesel-generators 2A, 2B, 2C, and 2D

e. Loss of the Div. 3 and Div. 4 4-kV switchgear

(3) Loss of ventilation for the 4-kV switchgear compartments, Class IE battery rooms, and static inverter compartments

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

This fire area contains a number of conduits containing electrical cabling associated with shutdown methods A and B for Units 1 and 2. All portions of conduits located within this fire area which are associated with shutdown methods A or B will be covered by a 1-inch thickness of a ceramic fiber blanket. This blanket will provide a 30-minute equivalent fire barrier, ensuring that a postulated fire in this area will not result in cable damage affecting safe shutdown capability.

This supplementary fire protection ensures that both of the shutdown methods (A and B) described in Section 5.2.2 will remain available to safety shut the plant down in the event of a fire.

Loss of ventilation for the control structure areas listed in (d)(3) above could result in a long-term temperature increase in those areas, depending on the heat loads in the various compartments. In order to prevent temperatures from becoming excessive if the normal ventilation cannot be re-established in those areas, portable fans will be provided for use in maintaining airflow through the affected compartments.

5.3.3 Fire Area 3: Unit 1 Class IE Battery Room (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

	Construction	Rating
Walls:	N - Reinforced concrete	2 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr*
Access:	Door connecting to area 2	3 hr

(b) Major safety-related components in fire area:

(1) Class IE battery 1DD101 (Div. 4)
(2) Battery charger 1DD103
(3) Fuse box 1DD105

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of Class IE dc power supplied by battery 1DD101 (Div. 4)

(2) Loss of diesel-generator 1D and associated 4-kV switchgear

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detector, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 1 down.

5.3.4 Fire Area 4: Unit 1 Class IE Battery Room (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

	Construction	Rating
Walls:	N - Concrete masonry unit	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr*
Access:	Door connecting to area 2	3 hr

(b) Major safety-related components in fire area:

(1) Class IE battery 1CD101 (Div. 3)
(2) Battery charger 1CD103
(3) Fuse box 1CD105

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of Class IE dc power supplied by battery 1CD101 (Div. 3)
(2) Loss of diesel-generator 1C and associated 4-kV switchgear

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detector, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no effect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method B is located in this fire area, this method will remain available to safely shut Unit 1 down.

5.3.5 Fire Area 5: Unit 2 Class IE Battery Room (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Concrete masonry unit	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr*
Access:	Door connecting to area 2	3 hr

(b) Major safety-related components in fire area:

(1) Class IE battery 2DD101 (Div. 4)
(2) Battery charger 2DD103
(3) Fuse box 2DD105

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of Class IE dc power supplied by battery 2DD101 (Div. 4)
(2) Loss of diesel-generator 2D and associated 4-kV switchgear

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detector, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no effect on the ability to achieve a safe shutdown on Unit 1. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safety shut Unit 1 down.

With regard to Unit 2, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 2 down.

5.3.6 Fire Area 6: Unit 2 Class IE Battery Room (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N -	Concrete masonry unit	3 hr
	E -	Reinforced concrete	3 hr
	S -	Concrete masonry unit	3 hr
	W -	Concrete masonry unit	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr*
Access:		Door connecting to area 2	3 hr

(b) Major safety-related components in fire area:

(1) Class IE battery 2CD101 (Div. 3)
(2) Battery charger 2CD103
(3) Fuse box 2CD105
(4) Rigid steel conduit containing cables associated with fan cabinet 0BV118 outlet damper (HD-78-097B)

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of Class IE dc power supplied by battery 2CD101 (Div. 3)
(2) Loss of diesel-generator 2C and associated 4-kV switchgear
(3) Loss of air flow through fan cabinet 0BV118

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no effect on the ability to achieve a safe shutdown on Unit 1. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 1 down.

With regard to Unit 2, since no equipment or cabling associated with shutdown method B is located in this fire area, this method will remain available to safely shut Unit 2 down.

5.3.7 Fire Area 7: Corridor (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Concrete masonry unit	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Doors connecting to areas 9, 11, 13, 15, 17, and 19	3 hr
	Steamtight doors connecting to areas 97 and 110	3 hr**

(b) Major safety-related components in fire area:

(1) Rigid steel conduits containing cables associated with the following Unit 1 components:

a. Class IE instrument ac transformers 10X106 (Div. 1) and 10X108 (Div. 3)

b. Class IE load center transformers 10X201 (Div. 1), 10X202 (Div. 2), and 10X203 (Div. 3)

c. Instrument rack 10C001 (core spray loop "A")

d. Instrument rack 10C018 (RHR loop "A" and RHRSW loop "A")

e. Instrument racks 10C075, 10C076, and 10C078 (RHR pumps "A", "B", and "D" discharge pressure)
f. Core spray pump 1BP206
g. Core spray pump discharge pressure transmitters (PT-52-1N055C&G)
h. RHR flow transmitters (FT-51-1N015B,C&D and FT-51-1N052B,C&D)
i. HPCI instrumentation
j. HPCI leakage detection system
k. RCIC instrumentation
l. RCIC leakage detection system
m. Diesel-generator 1D

(2) Rigid steel conduit containing cables associated with power supply from Unit 1 Class IE instrument ac panel 10Y102 (Div. 2) to the following components:
a. RHR and core spray vertical board 10C601
b. RHR and core spray relay board 10C618
c. HPCI vertical board 10C647
d. HPCI relay board 10C620
e. ESW and RHRSW vertical board 0BC667
f. Spray pond pump structure HVAC control panel 0BC564
g. MSIV leakage control system relay board 10C644
h. SGTS area HVAC control panel 00C124

(3) Rigid steel conduits containing cables associated with the following Unit 2 components:
a. Class IE instrument ac transformers 20X106 (Div. 1) and 20X108 (Div. 3)
b. Class IE load center transformers 20X201 (Div. 1), 20X202 (Div. 2), and 20X203 (Div. 3)
c. Instrument rack 20C001 (core spray loop "A")
d. Instrument rack 20C018 (RHR loop "A" and RHRSW loop "A")
e. Instrument racks 20C075, 20C076, 20C077, and 20C078 (RHR pumps "A", "B", "C", and "D" discharge pressure)
f. Core spray pump 2BP206
g. RCIC instrumentation
h. RCIC leakage detection system
i. HPCI leakage detection system
j. Diesel-generator 2D

(4) Rigid steel conduit containing cables associated with power supply from Unit 2 Class IE instrument ac panel 20Y102 (Div. 2) to the following components:
a. RHR and core spray vertical board 20C601
b. RHR and core spray relay board 20C618
c. HPCI vertical board 20C647
d. HPCI relay board 20C620
e. ESW and RHRSW vertical board 0BC677
f. MSIV leakage control system relay board 20C644

(5) Rigid steel conduits containing cables associated with the following common components:

a. Control structure chilled water loop "A" components (water chiller 0AK112, chiller oil pump 0AP168, chilled water circulation pump 0AP162, and instrumentation)
b. Control structure battery room HVAC exhaust dampers
c. Emergency switchgear and battery room HVAC system components (fan cabinet 0BV118, plus inlet and outlet dampers for fan cabinets 0AV118 and 0BV118)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Unit 1 systems
a. Loss of Class IE ac power supplied by load centers 10B201 (Div. 1) and 10B202 (Div. 2)
b. Loss of Class IE ac power supplied by instrument ac distribution panels 10Y101 (Div. 1) and 10Y103 (Div. 3)
c. Loss of RCIC system
d. Loss of HPCI system
e. Loss of core spray injection capability through loops "A" and "B"
f. Loss of capability to use steam condensing mode of RHR loop "A"
g. Loss of RHR loop "B"
h. Loss of diesel-generator 1D

(2) Unit 2 systems
a. Loss of Class IE ac power supplied by load centers 20B201 (Div. 1) and 20B202 (Div. 2)
b. Loss of Class IE ac power supplied by instrument ac distribution panels 20Y101 (Div. 1) and 20Y103 (Div. 3)
c. Loss of RCIC system
d. Loss of HPCI system
e. Loss of core spray injection capability through loops "A" and "B"
f. Loss of capability to use steam condensing mode of RHR loop "A"
g. Loss of RHR loop "B"
h. Loss of diesel-generator 2D

(3) Common systems
   a. Loss of ESW loop "B"
   b. Loss of RHRSW loop "B"
   c. Loss of spray pond pump structure ventilation using fan cabinet 0BV543
   d. Loss of control structure water chiller 0AK112
   e. Loss of ventilation to the 4-kV switchgear compartments, Class IE battery rooms, and static inverter compartments

(e) Consequences of fire with active fire suppperssion:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

This fire area contains cable trays, conduits, and gutters containing electrical cabling associated with shutdown methods A and B for Units 1 and 2. All portions of raceways located within this fire area which are associated with shutdown methods A or B will be covered by a 1-inch thickness of a ceramic fiber blanket. This blanket will provide a 30-minute equivalent fire barrier, ensuring that a postulated fire in this area will not result in cable damage affecting safe shutdown capability.

This supplementary fire protection ensures that both of the shutdown methods (A and B) described in Section 5.2.2 will remain available to safely shut the plant down in the event of a fire.

Loss of ventilation for the control structure areas listed in (3)e above could result in a long-term temperature increase in those areas, depending on the heat loads in the various compartments. In order to prevent temperatures from becoming excessive if the normal ventilation cannot be re-established in those areas, portable fans will be provided for use in maintaining airflow through the affected compartments.

5.3.8 Fire Area 8: Unit 1 Class IE Battery Room (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Door connecting to area 9	3 hr
	Steamtight door connecting to area 113	3 hr**

(b) Major safety-related components in fire area:

(1) Class IE batteries 1B1D101 and 1B2D101 (Div. 2)
(2) Battery chargers 1B1D103 and 1B2D103
(3) Fuse box 1BD105
(4) Rigid steel conduits containing cables associated with the following components:
a. Control structure battery room HVAC exhaust dampers (leading to fan system OAV124/OBV124)

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of diesel-generator 1B and the Div. 2 4-kV switchgear
(2) Loss of Class IE dc power supplied by motor control centers 10D202 and 10D203 and power distribution panel 1BD102 (all Div. 2)
(3) Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 1 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 1 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.9 Fire Area 9: Unit 1 Class IE Battery Room (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Concrete masonry unit	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Doors connecting to areas 7 and 8	3 hr

(b) Major safety-related components in fire area:

(1) Class IE batteries 1A1D101 and 1A2D101 (Div. 1)
(2) Battery chargers 1A1D103 and 1A2D103
(3) Fuse box 1AD105

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of diesel-generator 1A and the Div. 1 4-kV switchgear
(2) Loss of Class IE dc power supplied by motor control center 10D201 (Div. 1) and power distribution panel 1AD102 (Div. 1)

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method B is located in this fire area, this method will remain available to safely shut Unit 1 down.

5.3.10 Fire Area 10: Unit 2 Class IE Battery Room (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete	3 hr
	S -	Concrete masonry unit	3 hr
	W -	Concrete masonry unit	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr

Access:	Door connecting to area 11	3 hr
	Steamtight door connecting to area 113	3 hr**

(b) Major safety-related components in fire area:

(1) Class IE batteries 2B1D101 and 2B2D101 (Div. 2)
(2) Battery chargers 2B1D103 and 2B2D103
(3) Fuse box 2BD105
(4) Rigid steel conduits containing cables associated with the following components:
a. Control structure battery room HVAC exhaust dampers (leading to fan system OAV124/OBV124)

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of diesel-generator 2B and the Div. 2 4-kV switchgear
(2) Loss of Class IE dc power supplied by motor control centers 20D202 and 20D203 and power distribution panel 2BD102 (all Div. 2)
(3) Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 1. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 1 down.

With regard to Unit 2, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 2 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 2 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.11 Fire Area 11: Unit 2 Class IE Battery Room (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Concrete masonry unit	3 hr
	E - Reinforced concrete	3 hr
	S - Concrete masonry unit	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Doors connecting to areas 7 and 10	3 hr

(b) Major safety-related components in fire area:

(1) Class IE batteries 2A1D101 and 2A2D101 (Div. 1)
(2) Battery chargers 2A1D103 and 2A2D103
(3) Fuse box 2AD105

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of diesel-generator 2A and the Div. 1 4-kV switchgear
(2) Loss of Class IE dc power supplied by motor control center 20D201 (Div. 1) and power distribution panel 2AD102 (Div 1)

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method B is located in this fire area, this method will remain available to safely shut Unit 1 down.

5.3.12 Fire Area 12: Unit 1 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Door connecting to area 13	3 hr
	Steamtight door connecting to area 113	3 hr**

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 10A117 (Div. 3)
(2) Class IE dc distribution panel 1CD102 (Div. 3)
(3) Class IE instrument ac distribution panel 10Y103 (Div. 3)

(4) Rigid steel conduits containing cables associated with the following components:
   a. RCIC leakage detection system
   b. Instrument rack 10C001 (core spray loop "A")
   c. Instrument rack 10C018 (RHR loop "A" and RHRSW loop "A")
   d. Instrument rack 10C075 (RHR pump "A" discharge pressure)
   e. ESW pump OAP548
   f. RHRSW loop "A" components (pump OAP506 and valves HV-12-017A and HV-12-034A)
   g. Spray pond pump structure HVAC system components (fan cabinet OAV543, heating coil OAE701, and instrument ac power to control panel OAC564)
   h. Unit 1 battery room HVAC exhaust dampers (leading to fan system OAV124/OBV124)

(5) Rigid steel conduit containing cables associated with power supply from Class IE dc distribution panel 1AD102 (Div. 1) to the following components:
   a. RHR and core spray vertical board 10C601
   b. RHR and core spray relay board 10C617
   c. RCIC relay board 10C621
   d. ADS relay board 10C628
   e. RCIC vertical board 10C648
   f. RPS channel "A" vertical board 10C609

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Unit 1 systems
   a. Loss of 4-kV switchgear 10A117 (Div. 3)
   b. Loss of Class IE dc power supplied by dc distribution panel 1CD102 (Div. 3)
   c. Loss of Class IE ac power supplied by instrument ac distribution panel 10Y103 (Div. 3)
   d. Loss of RCIC system
   e. Loss of RHR loop "A"
   f. Loss of core spray injection capability through loop "A"
   g. Loss of ADS valves

(2) Common systems
   a. Loss of ESW pump OAP548
   b. Loss of RHRSW pump OAP506

c. Loss of spray pond pump structure fan cabinet OAV543 and associated components
d. Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no effect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, no equipment or cabling associated with shutdown method B is located in this fire area, with the exception of the electrical power supply to the ADS valves. The components/cabling involved in the power supply to the ADS valves are dc distribution panel 1CD102 (Div. 3) and electrical cabling associated with dc distribution panel 1AD102 (Div. 1). Power from either one of these two dc distribution panels is sufficient to operate the ADS valves.

All portions of the raceways within this fire area that are associated with the power supply from panel 1AD102 to the ADS valves will be covered by a 2-inch thickness of a ceramic fiber blanket. This blanket will provide a 1-hour equivalent fire barrier, ensuring that a postulated fire in this area will not result in cable damage affecting shutdown method A.

This supplementary fire protection ensures that shutdown method A (as described in Section 5.2.2) will remain available to safely shut Unit 1 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 1 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.13 Fire Area 13: Unit 1 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

		Construction	Rating
Walls:	N -	Concrete masonry unit	3 hr
	E -	Concrete masonry unit	3 hr
	S -	Concrete masonry unit	3 hr
	W -	Concrete masonry unit	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr
Access:		Doors connecting to areas 7 and 12	3 hr

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 10A115 (Div. 1)
(2) Class IE dc distribution panel 1AD102 (Div. 1)
(3) Class IE instrument ac distribution panel 10Y101 (Div. 1)
(4) Rigid steel conduits containing cables associated with the following components:
   a. Class IE load center transformer 10X203 (Div. 3)
   b. Class IE instrument ac panel 10Y103 (Div. 3)
   c. Control structure chilled water system components (water chiller OAK112, chiller oil pump OAP162, chilled water circulation pump OAP168, and the Div. 3 instrument ac power supply to control panel 00C562)
   d. Unit 1 battery room HVAC exhaust dampers (leading to fan system OAV124/OBV124)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of 4-kV switchgear 10A115 (Div. 1)
(2) Loss of Class IE dc power supplied by dc distribution panel 1AD102 (Div. 1)

(3) Loss of Class IE ac power supplied by load center 10B203 (Div. 3)
(4) Loss of Class IE ac power supplied by instrument ac distribution panels 10Y101 (Div. 1) and 10Y103 (Div. 3)
(5) Loss of control structure water chiller OAK112 and associated components
(6) Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no effect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling asosociated with shutdown method B is located in this fire area, this method will remain available to safely shut Unit 2 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 1 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.14 Fire Area 14: Unit 1 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Door connecting to area 15	3 hr
	Steamtight door connecting to area 113	3 hr**

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 10A118 (Div. 4)
(2) Class IE instrument ac distribution panel 10Y104 (Div. 4)
(3) Rigid steel conduits containing cables associated with the following components:
a. Unit 1 battery room HVAC exhaust dampers (leading to fan system 0AV124/0BV124)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of 4-kV switchgear 10A118 (Div. 4)
(2) Loss of Class IE ac power supplied by instrument ac distribution panel 10Y104 (Div. 4)
(3) Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain avilable to safely shut Unit 1 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 1 or 2 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.15 Fire Area 15: Unit 1 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Concrete masonry unit	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Doors connecting to areas 7 and 14	3 hr

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 10A116 (Div. 2)
(2) Class IE instrument ac distribution panel 10Y102 (Div. 2)
(3) Rigid steel conduits containing cables associated with the following components:
   a. Class IE load center transformer 10X204 (Div. 4)
   b. Unit 1 and 2 battery room HVAC exhaust dampers (leading to fan systems 0AV124/0BV124 and 0AV118/0BV118)

c. Inlet and outlet dampers associated with emergency switchgear and battery room fan cabinets (0AV118 and 0BV118)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of 4-kV switchgear 10A116 (Div. 2)
(2) Loss of Class IE ac power supplied by instrument ac distribution panel 10Y102 (Div. 2)
(3) Loss of Class IE ac power supplied by load center 10B204 (Div. 4)
(4) Closure of HVAC dampers leading to battery room exhaust fans
(5) Loss of ventilation for 4-kV switchgear compartments, Class IE battery rooms, and static inverter compartments

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no effect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 1 down.

Loss of ventilation for the control structure areas listed in (d)5 above could result in a long-term temperature increase in those areas, depending on the heat loads in the various compartments. In order to prevent temperatures from becoming excessive if the normal ventilation cannot be re-established in those areas, portable fans will be provided for use in maintaining airflow through the affected compartments.

5.3.16 Fire Area 16: Unit 2 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Concrete masonry unit	3 hr
	S -	Concrete masonry unit	3 hr
	W -	Concrete masonry unit	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr
Access:		Door connecting to area 17	3 hr
		Steamtight door connecting to area 113	3 hr**

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 20A118 (Div. 4)
(2) Class IE instrument ac distribution panel 20Y104 (Div. 4)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of 4-kV switchgear 20A118 (Div. 4)
(2) Loss of Class IE ac power supplied by instrument ac distribution panel 20Y104 (Div. 4)

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 1. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 1 down.

With regard to Unit 2. since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 2 down.

5.3.17 Fire Area 17: Unit 2 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Concrete masonry unit	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Doors connecting to areas 7 and 16	3 hr

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 20A116 (Div. 2)
(2) Class IE instrument ac distribution panel 20Y102 (Div. 2)
(3) Rigid steel conduits containing cables associated with Unit 2 battery room HVAC exhaust dampers (leading to fan system 0AV124/0BV124)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of 4-kV switchgear 20A116 (Div. 2)
(2) Loss of Class IE ac power supplied by instrument ac distribution panel 20Y102 (Div. 2)
(3) Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 1. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 1 down.

With regard to Unit 2, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 2 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 2 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.18 Fire Area 18: Unit 2 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Concrete masonry unit	3 hr
	S - Concrete masonry unit	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr
Access:	Door connecting to area 19	3 hr
	Steamtight door connecting to area 113	3 hr**

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 20A117 (Div. 3)
(2) Class IE dc distribution panel 2CD102 (Div. 3)

(3) Class IE instrument ac distribution panel 20Y103 (Div. 3)
(4) Rigid steel conduits containing cables associated with the following Unit 2 components:
  a. RCIC leakage detection system
  b. Instrument rack 20C001 (core spray loop "A")
  c. Instrument rack 20C018 (RHR loop "A" and RHRSW loop "A")
  d. Instrument rack 20C075 (RHR pump "A" discharge pressure)
(5) Rigid steel conduit containing cables associated with power supply from Class IE dc distribution panel 2AD102 (Div. 1) to the following components:
  a. RHR and core spray vertical board 20C601
  b. RHR and core spray relay board 20C617
  c. RCIC relay board 20C621
  d. ADS relay board 20C628
  e. RCIC vertical board 20C648
  f. RPS channel "A" vertical board 20C609
(6) Rigid steel conduits containing cables associated with the following common components:
  a. RHRSW pump 0CP506
  b. Unit 2 battery room HVAC exhaust dampers (leading to fan system 0AV124/0BV124)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Unit 2 systems
  a. Loss of 4-kV switchgear 20A117 (Div. 3)
  b. Loss of Class IE dc power supplied by dc distribution panel 2CD102 (Div. 3)
  c. Loss of Class IE ac power supplied by instrument ac distribution panel 20Y103 (Div. 3)
  d. Loss of RCIC system
  e. Loss of core spray injection capability through loop "A"
  f. Loss of RHR loop "A"

(2) Common systems
  a. Loss of RHRSW pump 0CP506
  b. Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 1. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 1 down.

With regard to Unit 2, since no equipment or cabling associated with shutdown method B is located in this fire area, this method will remain available to safely shut Unit 2 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 2 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.19 Fire Area 19: Unit 2 4-kV Switchgear Compartment (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

		Construction	Rating
Walls:	N -	Concrete masonry unit	3 hr
	E -	Concrete masonry unit	3 hr
	S -	Concrete masonry unit	3 hr
	W -	Concrete masonry unit	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr
Access:		Doors connecting to areas 7 and 18	3 hr

(b) Major safety-related components in fire area:

(1) Class IE 4-kV switchgear 20A115 (Div. 1)
(2) Class IE dc distribution panel 2AD102 (Div. 1)
(3) Class IE instrument ac distribution panel 20Y101 (Div. 1)
(3) Rigid steel conduits containing cables associated with the following components:
  a. Class IE load center transformer 20X203 (Div. 3)
  b. Class IE instrument ac panel 20Y103 (Div. 3)
  c. Unit 2 battery room HVAC exhaust dampers

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of 4-kV switchgear 20A115 (Div. 1)
(2) Loss of Class IE dc power supplied by dc distribution panel 2AD102 (Div. 1)
(3) Loss of Class IE ac power supplied by instrument ac distribution panel 20Y101 (Div. 1)
(4) Loss of Class IE ac power supplied by load center 20B203 (Div. 3)
(5) Loss of Class IE ac power supplied by instrument ac distribution panel 20Y103 (Div. 3)

(6) Closure of HVAC dampers leading to battery room exhaust fans

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 1. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 1 down.

With regard to Unit 2, since no equipment or cabling associated with shutdown method B is located in this fire area, this method will remain available to safely shut Unit 2 down.

In the event of closure of any of the HVAC dampers in the ductwork leading from the Unit 2 battery rooms to the battery room exhaust fans, the exhaust from the affected rooms will be automatically recirculated to the emergency switchgear and battery room fan cabinets (0AV118 and 0BV118). This action will ensure the continued ventilation of the battery rooms.

5.3.20 Fire Area 20: Unit 1 Static Inverter Compartment (El. 254'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	2 hr
	E - Concrete masonry unit	3 hr
	S - Reinforced concrete	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr
Ceiling:	Reinforced concrete	3 hr
Access:	Two doors connecting to area 22	3 hr

(b) Major safety-related components in fire area:

(1) 125V dc power distribution panels 1BD102 (Div. 2) and 1DD102 (Div. 4)

(2) Rigid steel conduits containing cables associated with the following components:
   a. Containment hydrogen recombiner 1AS403
   b. Control structure chilled water loop "A" instrumentation

(3) Cable trays containing cables associated with the following components:
   a. RCIC system valves (HV-49-1F026 and HV-50-1F005)
   b. RHR loop "A" components (pump 1AP202 and instrumentation)
   c. RHR loop "C" components (pump suction valve HV-51-1F004C and instrumentation)
   d. Core spray loop "A" components (instrumentation and valves HV-52-1F031A and HV-52-1F001A&C)
   e. RHRSW loop "A" components (pump OAP506 and valve HV-12-003A)
   f. ESW loop "A" components (pump OAP548 and valves HV-11-015A, HV-11-041, HV-11-071, HV-11-121, and HV-11-123)
   g. Standby liquid control system components (pump 1AP208 and outboard containment isolation valve HV-48-1F006)
   h. Containment hydrogen recombiner suction and discharge isolation valves (HV-57-161 and HV-57-162)
   i. Drywell unit cooler fans 1A1V212, 1A2V212, 1C1V212, 1C2V212, 1E1V212, 1E2V212, 1G1V212, and 1G2V212
   j. Drywell cooling water source select valves
   k. Reactor recirculation pump cooling water containment isolation valves (HV-13-106 and HV-13-107)
   l. Diesel-generators 1A and 1C
   m. Class IE load center transformers 10X201 (Div. 1) and 10X203 (Div. 3)
   n. Instrument ac distribution panel 10Y201 (Div. 3)
   o. Control structure water chiller OAK112
   p. SGTS exhaust fan OAV109
   q. Control room return air fan OAV121 and associated inlet and outlet dampers (HD-78-059A&B and HD-78-060A&B)
   r. Control room emergency fresh air supply system components (fan OAV127, duct heater OAE191, and dampers HD-78-002A and HD-78-009A)
   s. Control structure HVAC system dampers (HD-78-018, HD-78-019, and HD-78-056)

(4) Cable trays containing cables associated with the power supply from Class IE instrument ac panel 10Y101 (Div. 1) to the following components:

a. RHR and core spray vertical board 10C601
b. RHR and core spray relay board 10C617
c. RCIC relay board 10C621
d. RPS channel "A" vertical board 10C609
e. Diesel-generator cell HVAC control panel 1AC563
f. MSIV leakage control system relay board 10C645
g. Drywell unit cooler control panel 10C234
h. SGTS area HVAC control panel 00C124
i. Reactor enclosure recirculation system control panel 10C207

(5) Cable trays containing cables associated with the power supply from Class IE instrument ac panel 10Y103 (Div. 3) to the following components:
a. RHR and core spray relay board 10C640
b. Control structure HVAC control panel 00C101
c. Unit cooler control panel 1CC208
d. SGTS area HVAC control panel 00C124

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Reactor trip
(2) Loss of Class IE dc power supplied by distribution panels 1BD102 (Div. 2) and 1DD102 (Div. 4)
(3) Loss of 4-kV switchgear in Divisions 2 and 4
(4) Loss of diesel-generators 1A and 1C
(5) Loss of Class IE ac power supplied by load centers 10B201 (Div. 1) and 10B203 (Div. 3)
(6) Loss of Class IE ac power supplied by instrument ac distribution panel 10Y201 (Div. 3)
(7) Loss of RCIC system
(8) Loss of core spray injection capability through loop "A"
(9) Loss of RHR loop "A"
(10) Loss of LPCI injection capability using RHR pump "C"
(11) Loss of RHRSW loop "A"
(12) Loss of ESW loop "A"
(13) Loss of standby liquid control system
(14) Loss of containment hydrogen recombiner 1AS403
(15) Loss of drywell unit coolers 1AV212, 1CV212, 1EV212, and 1GV212
(16) Loss of cooling water to all drywell unit coolers
(17) Loss of cooling water to reactor recirculation pumps
(18) Loss of the outboard portion of the MSIV leakage control system

(19) Loss of control structure water chiller OAK112
(20) Loss of SGTS exhaust fan OAV109
(21) Loss of ventilation for the control room, auxiliary equipment room, and control structure fan room

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

This fire area contains two dc distribution panels that are associated with shutdown method B, as well as several raceways containing electrical cabling associated with shutdown method A. All portions of the raceways within this fire area that are associated with shutdown method A will be covered by a 2-inch thickness of a ceramic fiber blanket. This blanket will provide a 1-hour equivalent fire barrier, ensuring that a postulated fire in this area will not result in cable damage affecting shutdown method A.

This supplementary fire protection ensures that shutdown method A (as described in Section 5.2.2) will remain available to safely shut the plant down.

5.3.21 Fire Area 21: Unit 2 Static Inverter Compartment (El. 254'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr
Ceiling:	Reinforced concrete	3 hr
Access:	Two doors connecting to area 23	3 hr
	Steamtight door connecting to area 113	3 hr**

(b) Major safe.y-related components in fire area:

(1) 125V dc power distribution panels 2BD102 (Div. 2) and 2DD102 (Div. 4)
(2) Rigid steel conduits containing cables associated with the following components:
  a. Containment hydrogen recombiner 2BS403
  b. Control structure chilled water loop "B" instrumentation
(3) Cable trays containing cables associated with the following components:
  a. RHR loop "D" components (pump 2DP202 and instrumentation)
  b. Core spray loop "B" components (instrumentation and valve HV-52-2F001D)
  c. RHRSW loop "B" components (pump 0DP506 and valve HV-12-003D)
  d. ESW loop "B" components (pump 0DP548 and valves)
  e. Containment hydrogen recombiner suction and discharge isolation valves (HV-57-263 and HV-57-264)
  f. Drywell unit cooler fans 2B2V212, 2D2V212, 2F2V212, and 2H2V212
  g. Diesel-generator 2D
  h. Class IE load center transformer 20X204 (Div. 4)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Reactor trip
(2) Loss of Class IE dc power supplied by distribution panels 2DB102 (Div. 2) and 2DD102 (Div. 4)
(3) Loss of 4-kV switchgear in Divisions 2 and 4
(4) Loss of diesel-generator 2D
(5) Loss of Class IE ac power supplied by load center 20B204 (Div. 4)
(6) Loss of core spray injection capability through loop "B"
(7) Loss of RHRSW loop "B"
(8) Loss of ESW loop "B"
(9) Loss of containment hydrogen recombiner 2BS403
(10) Loss of control structure chilled water pump 0BP162

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

With regard to Unit 1, since no equipment or cabling associated with shutdown method A is located in this fire area, this method will remain available to safely shut Unit 1 down.

5.3.22 Fire Area 22: Unit 1 Cable Spreading Room (El. 254'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Concrete masonry unit	3 hr
	S - Reinforced concrete	3 hr
	W - Reinforced concrete (part)	3 hr
	W - Concrete masonry unit (part)	3 hr
Floor:	Reinforced concrete	3 hr
Ceiling:	Reinforced concrete	3 hr
Access:	Two doors connecting to area 20	3 hr
	Doors connecting to area 23 and stairwell no. 7	3 hr

(b) Major safety-related components in fire area:

(1) Cabling for Div. 1, 2, 3, and 4 safeguard equipment (in cable tray, gutter, and conduit)
(2) Cabling for Div. A1, A2, B1, and B2 of the reactor protection system (in cable tray)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

The loss of all electrical cabling in this area would render all Unit 1 systems inoperable from the control room.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. In the event that a postulated fire is not controlled by fire brigade response, heat detectors will actuate discharge of the automatic, total-flooding CO_2 system. HVAC system penetrations into the area will be sealed off by steam isolation dampers which close automatically when the CO_2 system is actuated. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area would have no effect on Unit 2, with the exception of common systems that are shared between Units 1 and 2. Shutdown methods A and B (as described in Section 5.2.2) would both remain available to safely shut Unit 2 down.

As noted in (d) above, a fire in this area would interfere with the control of Unit 1 systems from the control room. However, such a fire would not affect the remote shutdown panels, since cables associated with the remote shutdown panels are not routed through the cable spreading room. The remote shutdown panels (described in Section 5.2.3) provide controls for sufficient systems to enable the operator to safely shut Unit 1 down.

As additional protection against the effects of a postulated fire, all portions of raceways located within this fire area which are associated with shutdown methods A or B will be covered by a 1-inch thickness of a ceramic fiber blanket. This blanket will provide a 30-minute equivalent fire barrier, ensuring that a postulated fire in this area will not result in cable damage affecting the systems used for shutdown methods A or B.

5.3.23 Fire Area 23: Unit 2 Cable Spreading Room (El. 254'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Concrete masonry unit	3 hr
	S - Reinforced concrete	3 hr
	W - Concrete masonry unit	3 hr
Floor:	Reinforced concrete	3 hr
Ceiling:	Reinforced concrete	3 hr
Access:	Two doors connecting to area 21	3 hr
	Door connecting to area 23	3 hr

(b) Major safety-related components in fire area:

(1) Cabling for Div. 1, 2, 3, and 4 safeguard equipment (in cable tray, gutter, and conduit)
(2) Cabling for Div. A1, A2, B1, and B2 of the reactor protection system (in cable tray)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

The loss of all electrical cabling in this area would render all Unit 2 systems inoperable from the control room.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. In the event that a postulated fire is not controlled by fire brigade response, heat detectors will actuate discharge of the automatic, total-flooding CO_2 system. HVAC system penetrations into the area will be sealed off by steam isolation dampers which close automatically when the CO_2 system is actuated. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area would have no effect on Unit 1, with the exception of common systems that are shared between Units 1 and 2. Shutdown methods A and B (as described in Section 5.2.2) would both remain available to safely shut Unit 1 down.

As noted in (d) above, a fire in this area would interfere with the control of Unit 2 systems from the control room. However, such a fire would not affect the remote shutdown panels, since cables associated with the remote shutdown panels are not routed through the cable spreading room. The remote shutdown panels (described in Section 5.2.3) provide controls and instrumentation for sufficient sytems to enable the operator to safely shut Unit 2 down.

As additional protection against the effects of a postulated fire, all portions of raceways located within this fire area which are associated with shutdown methods A or B will be covered by a 1-inch thickness of a ceramic fiber blanket. This blanket will provide a 30-minute equivalent fire barrier, ensuring that a postulated fire in this area will not result in cable damage affecting the systems used for shutdown methods A or B.

5.3.24 Fire Area 24: Control Room and Peripheral Rooms (El. 269'-0")

(a) Structural and architectural design features of fire area (see Figure B-8):

		Construction	Rating
Walls:	N -	Reinforced concrete (part adjacent to stairwell No. 7)	2 hr
	N -	Reinforced concrete (part)	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete	3 hr
	W -	Reinforced concrete (part)	3 hr
	W -	Reinforced concrete (part adjacent to stairwell no. 7)	2 hr

Floor:	Reinforced concrete	3 hr
Ceiling:	Reinforced concrete	3 hr
Access:	Two steamtight doors connecting to area 114	3 hr**

(b) Safety-related components in fire area:

Safety-related control panels as listed below are located in the control room.

Unit 1 Panels

10C601	Residual heat removal (Div. 1, 2, 3, 4) Core spray (Div. 1, 2, 3, 4) MSIVs (Div. 1, 2, 3, 4) Reactor pressure and level (Div. 1 & 2) Containment atmospheric control system (Div. 1, 2, 3, 4)
10C602	Reactor water cleanup (Div. 1 & 2) Reactor recirculation system Reactor head vent valves Drywell floor and equipment drain sumps
10C603	Reactor control (Div. 1, 2, 3, 4)
10C614	NSSS temperature recorder and leak detection
10C626	Automatic depressurization system (Div. 1 & 3) MSIV leakage control (Div. 1, 2, 3, 4) Containment combustible gas analyzer (Div. 3 & 4)
10C647	HPCI (Div. 2 & 4)
10C648	RCIC (Div. 1 & 3)
10C651	Feedwater, condensate, and turbine (Div. 1, 2. 3)
10C668	Feedwater (Div. 1)
10C669	Condensate (Div. 1)
10C681	Reactor enclosure HVAC (Div. 1 & 2) Control structure HVAC (Div. 1 & 2) Spray pond pump structure HVAC (Div. 1, 2, 3, 4)
1AC661	Safeguard ac power supply (Div. 1)

1BC661	Safeguard ac power supply (Div. 2)
1CC661	Safeguard ac power supply (Div. 3)
1DC661	Safeguard ac power supply (Div. 4)
1AC696	Containment hydrogen recombiner package "A" (Div. 1)
1BC696	Containment hydrogen recombiner package "B" (Div. 2)

<u>Unit 2 Panels</u>

20C601	Residual heat removal (Div. 1, 2, 3, 4) Core spray (Div. 1, 2, 3, 4) MSIVs (Div. 1, 2, 3, 4) Reactor pressure and level (Div. 1 & 2) Containment atmospheric control system (Div. 1, 2, 3, 4)
20C602	Reactor water cleanup (Div. 1 & 2) Reactor recirculation system Reactor head vent valves Drywell floor and equipment drain sumps
20C603	Reactor control (Div. 1, 2, 3, 4)
20C614	NSSS temperature recorder and leak detection
20C626	Automatic depressurization system (Div. 1 & 3) MSIV leakage control (Div. 1, 2, 3, 4) Containment combustible gas analyzer (Div. 3 & 4)
20C647	HPCI (Div. 2 & 4)
20C648	RCIC (Div. 1 & 3)
20C651	Feedwater, condensate, and turbine (Div. 1, 2, 3)
20C668	Feedwater (Div. 1)
20C669	Condensate (Div. 1)
20C681	Reactor enclosure HVAC (Div. 1 & 2) Control structure HVAC (Div. 1 & 2) Spray pond pump structure HVAC (Div. 1, 2, 3, 4)
2AC661	Safeguard ac power supply (Div. 1)
2BC661	Safeguard ac power supply (Div. 2)

2CC661	Safeguard ac power supply (Div. 3)
2DC661	Safeguard ac power supply (Div. 4)
2AC696	Containment hydrogen recombiner package "A" (Div. 1)
2BC696	Containment hydrogen recombiner package "B" (Div. 2)

Common Panels

CAC667	ESW and RHRSW (Div. 1)
0BC667	ESW and RHRSW (Div. 2)
0CC667	ESW and RHRSW (Div. 3)
0DC667	ESW and RHRSW (Div. 4)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray, gutter, or control panels. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

The raceways and control panels in the control room have been designed to incorporate divisional separation in order to maintain the independence of redundant divisions of safety-related cables and electrical devices. Considering the absence of combustibles which could contribute to an exposure fire in this area, the separation is adequate to prevent a fire in one division of cabling from propagating and affecting a redundant division. Spurious actuation or shutdown of equipment may occur in the division in which the fire originates. Faulty indications and annunciations may also occur in the affected division.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. The operator will then bring the plant fire brigade to manually extinguish the fire. Depending on the severity and rate of spread of the fire, loss of the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area could affect either of the reactor units or, if common systems are involved, both units. However, since divisional separation of raceways and in-panel wiring will limit the fire to one division of cabling, no more than one of the two shutdown methods (methods A and B as described in Section 5.2.2) would be disabled. The other shutdown method will remain available to bring both reactor units to safe shutdown.

In the event that the control room becomes uninhabitable due to the effects of a fire, the operator can use the remote shutdown panels to adequately control the plant. In order to prevent a fire in the control room from adversely affecting the operability of the remote shutdown panels, the cables associated with these panels are not routed through the control room. The remote shutdown panels (described in Section 5.2.3) provide controls and instrumentation for sufficient systems to enable the operator to bring both reactor units to safe shutdown.

5.3.25 Fire Area 25: Auxiliary Equipment Room (El. 289'-0")

(a) S uctural and architectural design features of fire area (see Figure B-8):

	Construction	Rating
Walls:	N - Reinforced concrete (part adjacent to stairwell no. 7)	2 hr
	N - Reinforced concrete (part)	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
	W - Reinforced concrete (part)	3 hr
	W - Reinforced concrete (part adjacent to stairwell no. 7)	2 hr
Floor:	Reinforced concrete	3 hr
Ceiling:	Reinforced concrete	3 hr
Access:	Two doors connecting to stairwell no. 7	1.5 hr
	Steamtight door connecting to area 111	3 hr**

(b) Major safety-related components in fire area:

The safety-related components located in the auxiliary equipment room consist mainly of the power generation control complexes (PGCC) for Unit 1 and Unit 2. The PGCC for each unit consists of vertical boards mounted on raised floor sections, with a termination cabinet located at one end of each floor section. The safety-related portions of the PGCC are identified in the following listing. The listing applies specifically to Unit 1, but the Unit 2 PGCC is identical.

Floor Sect. & Term. Cabinet	Vertical Board	
10U791 &	10C617	RHR and core spray (Div. 1)
10C791	10C640	RHR and core spray (Div. 3)
	10C621	RCIC
	10C628	ADS (Div. 1)
	10C631	ADS (Div. 3)
10U792 &	10C618	RHR and core spray (Div. 2)
10C792	10C641	RHR and core spray (Div. 4)
	10C620	HPCI
	10C613	Process instrumentation
	10C644	MSIV leakage control system (Div. 2)
10U787 &	10C645	MSIV leakage control system (Div. 1)
10C787	10C608	Power range neutron monitoring
10U788 &	10C623	Outboard containment isolation
10C788		valves
10U789 &	10C606	Startup range neutron monitoring "A"
10C787	10C609	RPS channel A
10U790 &	10C633	Startup range neutron monitoring "B"
10C790	10C611	RPS channel B
10U793 &	10C622	Inboard containment isolation valves
10C793	10C612	Feedwater and reactor recirculation
		instrumentation

Also located in the auxiliary equipment room are the remote shutdown panels (10C201 and 20C201), which are not specifically associated with the PGCC.

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray, termination cabinets, raised flooring, or vertical boards. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

The raceways, raised flooring, termination cabinets, and vertical boards in the auxiliary equipment room have been designed to incorporate divisional separation in order to maintain the independence of redundant divisions of safety-related cables and electrical devices. The only fire potential in this area is ignition of cable insulation due to electrical faulting. Since the majority of the cables in the area involve low voltage instrument and control circuits, overload protection is provided, and cable insulation is flame retardant, this potential source of fire is minimal.

Particular attention has been given to minimizing the potential for fire and maximizing divisional separation in the power generation control complex (PGCC) and associated facilities. The PGCC and the computer facilities, both of which are located in the auxiliary equipment room, utilize raised flooring approximately 1 foot high. The raised flooring is divided into sections typically 8 feet wide and approximately 20 feet long; PGCC panels or computer equipment are mounted near the center of each floor section. The floor sections are of all-steel construction and are each divided into four longitudinal raceways and numerous lateral raceways, each of which is totally enclosed and therefore physically isolated from adjacent raceways. To minimize the possibility of occurrence of a fire, the cabling routed in these raceways is provided with flame retardant insulation, and no other combustible material exists in the floor sections. In addition, the routing of power cabling through the floor section raceways is minimized; power cabling which cannot be eliminated from these raceways is routed in conduit or as armored cable. To prevent the spread of a postulated fire between different divisions of raceways within a floor section or between adjacent floor sections, fire stops are provided at the ends of the longitudinal raceways, at the ends of those lateral raceways which do not have end caps, in the lateral raceways where cables run from a longitudinal to a lateral raceway, and at the raceway openings at the bottom of the vertical panels. These fire stops consist of refractory material covered by silicone rubber.

The General Electric Company licensing topical report NEDO-10466-A, "Power Generation Control Complex Design Criteria and Safety Evaluation" (February 1979), describes the design concepts for the construction of the PGCC components, their arrangement within the PGCC, and the routing of interpanel cabling. The report includes typical plant configurations which are conceptually applicable to the Limerick Generating Station. Additionally, a safety evaluation is provided which addresses NRC and industry safety guidelines and demonstrates design compliance.

Considering the absence of combustibles which could contribute to an exposure fire in this area, the separation is adequate to prevent a fire in one division of cabling from propagating and affecting a redundant division. Spurious actuation or shutdown of equipment may occur in the division in which the fire originates. Faulty indications and annunciations may also occur in the affected division.

(e) Consequences of fire with active fire suppression:

Smoke detectors are located inside each of the termination cabinets and floor sections in the auxiliary equipment room to provide early warning of fires originating in these components. Additional fire detectors are located in the general area of the auxiliary equipment room, near the ceiling, to provide early warning of fires originating outside the termination cabinets and floor sections. Activation of any of the above smoke detectors will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. In the event that a fire in the floor sections is not extinguished by fire brigade response, heat detectors in the floor sections will activate the Halon extinguishing system. The Halon system is described in Section 2.9.

Depending on the severity and rate of spread of a postulated fire, loss of the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area could affect either of the reactor units or, if common systems are involved, both units. However, since divisional separation of raceways and in-panel wiring will limit the fire to one division of cabling, no more than one of the two shutdown methods (methods A and 3 as described in Section 5.2.2) would be disabled. The other shutdown method will remain available to bring both reactor units to safe shutdown.

5.3.26 Fire Area 27: Control Structure Fan Room (El. 304'-0")

(a) Structural and architectural design features of fire area (see Figure B-9):

		Construction	Rating
Walls:	N -	Reinforced concrete (parts adjacent to stairwell nos. 7 and 8)	2 hr
	N -	Reinforced concrete (part)	3 hr
	E -	Reinforced concrete (part adjacent to stairwell no. 8)	2 hr
	E -	Reinforced concrete (part)	3 hr
	S -	Reinforced concrete	3 hr
	W -	Reinforced concrete (part)	3 hr
	W -	Reinforced concrete (part adjacent to stairwell no. 7)	2 hr
Floor:		Reinforced concrete	3 hr
Ceiling:		Reinforced concrete	3 hr*
Access:		Doors connecting to stairwell nos. 7 and 8	1.5 hr
		Two steamtight doors connecting to area 99	3 hr**
		Steamtight door connecting to area 112	3 hr**

(b) Major safety-related components in fire area:

(1) HVAC 120V ac distribution panel 10Y163 (Div. 3), which serves the following components:
   a. Diesel-generator enclosure HVAC control panel 1CC563
   b. Unit cooler control panel 1CC208
   c. Control structure HVAC local panel 0AC101
   d. SGTS control panel 0CC124
   e. Containment combustible gas analyzer package 10S206
   f. ESW control valve XC-11-053A (for control structure chiller "A")
   g. Control structure chilled water control valves XC-90-042A, XC-90-043A, and XC-90-044A

(2) HVAC 120V ac distribution panel 10Y164 (Div. 4), which serves the following components:
   a. Diesel-generator enclosure HVAC control panel 1DC563
   b. Unit cooler control panel 1DC208
   c. Control structure HVAC local panel 0BC101
   d. SGTS control panel 0CC124
   e. Containment combustible gas analyzer 10S205
   f. ESW control valve XC-11-053B (for control structure chiller "B"
   g. Control structure chilled water control valves XC-90-042B, XC-90-043B, and XC-90-044B

(3) Motor control center 00B131 (Div. 3), which serves the following components:
   a. HVAC 120V ac distribution panel 10Y163

b. Control room emergency supply air fan (0AV127) and intake heater (0AE191)
c. Control room emergency air intake isolation valve HV-78-020C
d. Control room air supply fan cabinet (0AV116) and heater (0AE192)
e Control room return air fan 0AV121
f. Auxiliary equipment room supply air fan cabinet (0AV114) and heater (0AE193)
g. Auxiliary equipment room return air fan 0AV120
h. Emergency switchgear and battery room supply air fan cabinet 0AV118
i. Control structure chilled water pump (0AP162), oil pump (0AP168), pumpout compressor (0AK114)

(4) Motor control center 00B132 (Div. 4), which serves the following components:
a. HVAC 120V ac distribution panel 10Y164
b. Control room emergency supply air fan (0BV127) and intake heater (0BE191)
c. Control room emergency air intake isolation valve HV-78-020D
d. Control room air supply fan cabinet (0BV116) and heater (0BE192)
e. Contorl room return air fan 0BV121
f. Auxiliary equipment room supply air fan cabinet (0BV114) and heater (0BE193)
g. Auxiliary equipment room return air fan 0BV120
h. Emergency switchgear and battery room supply air fan cabinet 0BV118
i. Control structure chilled water pump (0BP162), oil pump (0BP168), and pumpout compressor (0BK114)

(5) Control structure HVAC local panels 0AC101, 0BC101, 0CC101, and 0DC101
(6) Auxiliary equipment room supply air fan cabinets 0AV114 and 0BV114
(7) Control room supply air fan cabinets 0AV116 and 0BV116
(8) Auxiliary equipment room return air fans 0AV120 and 0BV120
(9) Control room return air fans 0AV121 and 0BV121
(10) Control room emergency fresh air supply fans and filter trains 0AV127 and 0BV127
(11) Rigid steel conduits containing cables associated with the following components:
a. SGTS exhaust fan 0AV109
b. SGTS inlet heater 0AE188
c. SGTS compartment unit cooler 0AV140
d. SGTS access area unit cooler 0AV141
e. Reactor enclosure HVAC valve HV-76-167

(c) Postulated fire in area:

Ignition of charcoal filters.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of containment combustible gas analyzer packages 10S205 and 10S206
(2) Loss of unit coolers for core spray pumps "C" and "D" and RHR pumps "C" and "D", which may affect the long-term operability of those pumps
(3) Loss of ventilation for diesel-generator cells 1C and 1D
(4) Loss of SGTS system
(5) Loss of ventilation for the following areas in the control structure
  a. Battery rooms
  b. 4-kV switchgear compartments
  c. Static inverter compartments
  d. Control room
  e. Auxiliary equipment room
  f. Control structure fan room
  g. SGTS access area
  h. SGTS filter compartments
(6) Loss of ventilation exhaust from refueling floor

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. In the event of a fire in one of the control room emergency fresh air filters, a heat detector inside the filter plenum will cause an audible-visual annunciation to register on the fire protection panels. The fire brigade will utilize a manual valve in the fire protection water supply system to initiate operation of a water spray system inside the filter plenum. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

A fire in this area will have no affect on the ability to achieve a safe shutdown on Unit 2. Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut Unit 2 down.

This fire area contains two ac distribution panels that are associated with shutdown methods A and B for Unit 1. The two panels are separated by a distance of approximately 70 feet, ensuring that a postulated fire in this area will not affect more than one of the panels.

The cables associated with the ac distribution panels are generally routed on opposite sides of the control structure, in order to maximize the separation between the two redundant divisions. At the south side of the control structure, where the separation between the two divisions of cabling is at a minimum, the cables are routed within about 12 feet of each other. Those portions of the raceways containing these cables which are located within 20 feet of the redundant raceways will be covered by a 1-inch thickness of a ceramic fiber blanket. This blanket will provide a 30-minute equivalent fire barrier, ensuring that a postulated fire in this area will not result in cable damage affecting more than one of the shutdown methods.

This supplementary fire protection ensures that at least one of the shutdown methods (A and B) described in Section 5.2.2 will remain available to safely shut Unit 1 down.

Loss of ventilation for the control structure areas listed in (d)(5) above could result in a long-term temperature increase in those areas, depending on the heat loads in the various compartments. Design changes will be implemented as necessary to prevent excessive temperatures from occurring.

5.3.27 Fire Area 28: SGTS Filter Compartments and Access Area (El. 332'-0")

(a) Structural and architectural design features of fire area (see Figure B-10):

		Construction	Rating
Walls:	N -	Reinforced concrete (exterior wall, also contains louver openings)	None
	N -	Reinforced concrete (parts adjacent to stairwell nos. 7 and 8)	2 hr
	E -	Reinforced concrete (part adjacent to stairwell no. 8)	2 hr
	E -	Reinforced concrete (part)	3 hr
	S -	Reinforced concrete	3 hr
	W -	Reinforced concrete (part)	3 hr
	W -	Reinforced concrete (part adjacent to stairwell no. 7)	2 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete (roof slab)	3 hr*

Access:	Two doors connecting to stairwell no. 7	1.5 hr
	Door connecting to stairwell no. 8	1.5 hr
	Steamtight doors connecting to areas 46 and 69	3 hr**

(b) Major safety-related components in fire area:

(1) SGTS filters
Train A: OAF169, OAF170, OAF183
Train B: OBF169, OBF170, OBF183
(2) SGTS exhaust fans OAV109 and OBV109
(3) SGTS compartment exhaust fans 0AV131 and 0BV131
(4) Rigid steel conduits containing cables associated with the following components:
a. Refueling floor air supply valves (HV-76-117 and HV-76-118)
b. RERS inlet valves (HV-76-151 and HV-76-152)

(c) Postulated fire in area:

Ignition of charcoal filters.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of standby gas treatment system
(2) Loss of ventilation for the SGTS compartments and SGTS access area
(3) Loss of ventilation supply to refueling floor

(e) Consequences of fire with active fire suppression:

In the event of a fire in one of the standby gas treatment system filters, a heat detector inside the filter plenum will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. The fire brigade will utilize a manual valve in the fire protection water supply system to initiate operation of a water spray system inside the filter plenum.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with either of the two shutdown methods described in Section 5.2.2 is located in this fire area, both of these methods will remain available to safely shut the plant down.

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5.4 SAFE SHUTDOWN ANALYSIS - UNIT 1 REACTOR ENCLOSURE

5.4.1 Fire Area 29: Suppression Chamber (El. 181'-11")

(a) Structural and architectural design features of fire area (see Figures B-4, B-5, and B-6):

	Construction	Rating
Walls:	All around - Reinforced concrete (primary containment wall)	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (diaphragm slab)	None
Access:	Two access hatches connecting to area 44	None

(b) Major safety-related components in fire area:

(1) Primary containment vacuum relief valve assemblies PSV-57-137A,B,C&D

(c) Postulated fire in area:

Since there are no combustible materials located in this area, no fire is postulated to occur.

(d) Consequences of fire without active fire suppression:

Not applicable (see item (c)).

(e) Consequences of fire with active fire suppression:

Not applicable (see item (c)).

(f) Effect of fire on safe shutdown:

Not applicable (see item (c)).

5.4.2 Fire Area 30: Drywell (El. 237'-11")

(a) Structural and architectural design features of fire area (see Figures B-7, B-8, and B-9):

	Construction	Rating
Walls:	All around - Reinforced concrete (primary containment wall)	3 hr
Floor:	Reinforced concrete (diaphragm slab)	None
Ceiling:	Steel dome (drywell head)	None
Access:	Equipment hatch connecting to area 45	None
	Equipment hatch with personnel lock connecting to area 45	None

(b) Major safety-related components in fire area:

(1) Control rod drive mechanisms (total of 185)
(2) Main steam isolation valves (inboard, one per steam line)
(3) Main steam relief valves (total of 14)
(4) Drywell unit coolers (total of 8)
(5) Inboard containment isolation valves for HPCI steam supply line, RCIC steam supply line, RWCU letdown line, and RHR shutdown cooling suction line

(c) Postulated fire in area:

(1) Leakage of lube oil from a recirculation pump motor onto the diaphragm slab, with subsequent ignition of the oil.
(2) Ignition of electrical cabling in cable tray or gutter.

(d) Consequences of fire without active fire suppression:

With two exceptions (cabling associated with the neutron monitoring system (NMS) and cabling associated with CRD position and temperature indication), electrical cabling in the drywell is routed in rigid steel conduit attached to either the drywell liner plate or to structural steel beams. The NMS and CRD cables terminate inside the RPV pedestal at the neutron monitoring assemblies and control rod drive mechanisms extending downward from the bottom head of the reactor vessel. The NMS and CRD cables are routed within the RPV pedestal in metal gutters. In the general drywell area outside the RPV pedestal, the NMS cables are routed in conduit whereas the CRD cables are routed in cable tray. Thus, the CRD cables are the only cables in the general drywell area that are not routed in conduit. Since the NMS and CRD cables are low-power instrumentation cables and are very conservatively rated, no significant hazard of ignition of insulation and jacketing materials due to electrical faulting exists. In addition, the insulation and jacketing materials of these cables are fire-retardant so that burning cables will not propagate a flame and will self-extinguish once any source of ignition has been removed. Neither the NMS cables nor the CRD cables are needed for safe shutdown of the plant.

Conduits containing cabling associated with shutdown methods A or B are not routed through the lower 17 feet of the drywell, with the exception of cabling to the inboard isolation valves for the HPCI and RCIC steam supply lines, which are located about 9 feet and 8 feet, respectively, above the diaphragm slab. Since the conduits containing cabling for the HPCI and RCIC steam supply line isolation valves are routed along the periphery of the drywell (attached to the liner plate), it is unlikely that this cabling would be affected by a fire involving lube oil leaked from one of the recirculation pump motors. Any leakage from these motors, rather than spreading across the diaphragm slab, would be collected by floor drains located beneath the recirculation pumps, and would drain into the drywell floor drain sump. The height above the diaphragm slab of conduits containing other cables associated with shutdown methods A or B precludes the possibility of damage to these cables from an oil fire.

In summary, the limited quantities of combustible materials located within the drywell and the separation of safe shutdown conduits from each other and from the combustible materials ensures the availability of shutdown methods A and B in the event of a postulated fire in the drywell.

The possibility of a fire in the drywell is limited to periods when the reactor is shut down. This is because the primary containment is inerted with nitrogen during reactor operation, so that the oxygen concentration is maintained below 5% by volume. This inert atmosphere will prevent fires from occurring in the primary containment.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in the drywell, the operator will dispatch the plant fire brigade to El. 253 feet in the reactor enclosure. The fire brigade will enter the drywell through the personnel airlock and will ensure extinguishment of the fire through the use of portable fire extinguishers or hoses from hose reels located outside the entrances to the drywell.

(f) Effect of fire on safe shutdown:

As discussed in item (d) above, a postulated fire in the drywell will not jeopardize the integrity of electrical cabling associated with either of the specified shutdown methods. Shutdown methods A and B (as described in Section 5.2.2) will both remain available to safely shut the plant down.

5.4.3 Fire Area 31: Residual Heat Removal Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	NW - Reinforced concrete (primary containment wall)	3 hr
	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete (part adjacent to area 75, part adjacent to unexcavated area)	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (ceiling contains 115 ft^2 of unrated metal blowout panels leading to area 43)	None
Access:	Watertight doors connecting to areas 32 and 39	3 hr
	Steamtight doors (at El. 201 feet) connecting to areas 32 and 41	3 hr**

(b) Major safety-related components in fire area:

(1) RHR pumps 1BP202 and 1DP202
(2) RHR heat exchanger 1BE205
(3) RHR compartment unit coolers 1BV210, 1DV210, 1FV210, and 1HV210
(4) Rigid steel conduits containing cables associated with the following components:
    a. ESW loop "B" valves (HV-11-044, HV-11-124, and HV-11-125)
    b. HPCI compartment unit coolers
    c. Containment hydrogen recombiner isolation valves (HV-57-163 and HV-57-164)
    d. Reactor recirculation pump cooling water valves (HV-13-108, HV-13-109, HV-13-110, and HV-13-111)
(5) Cable trays containing cables associated with the following components:

a. ESW loop "B" valves (HV-11-044, HV-11-72, HV-11-073, HV-11-124, and HV-11-125)
b. HPCI valves (HV-55-1F028 and HV-56-1F025)
c. Containment hydrogen recombiner isolation valves (HV-57-163 and HV-57-164)
d. Reactor recirculation pump cooling water valves (HV-13-108, HV-13-109, HV-13-110, and HV-13-111)

(c) Postulated fire in area:

Leakage of lube oil from both RHR pump motors onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RHR loop "B"
(2) Loss of LPCI injection capability using RHR pump "D"
(3) Loss of HPCI compartment unit coolers, which may affect the long term availability of the HPCI system
(4) Loss of containment hydrogen recombiner 1BS403
(5) Loss of cooling water to both reactor recirculation pumps

The existence of unrated metal panels in the ceiling of this fire area is acceptable because the low combustible loadings in the areas above and below the panels and the height of the panels above the floor (40 feet) preclude the possibility of fire propagating through the panels. Penetrations of piping and electrical raceway through the ceiling are provided with 3-hour rated seals.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.4.4 Fire Area 32: Residual Heat Removal Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	W - Reinforced concrete	3 hr
	NW - Reinforced concrete	3 hr
	NE - Reinforced concrete (primary containment wall)	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete (part adjacent to area 75, part adjacent to unexcavated area)	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (ceiling contains 150 ft^2 of unrated metal blowout panels leading to area 43)	None
Access:	Watertight doors connecting to areas 31 and 33	3 hr
	Steamtight doors (at El. 201 feet) connecting to areas 31 and 42	3 hr*

(b) Major safety-related components in fire area:

(1) RHR pumps 1AP202 and 1CP202
(2) RHR heat exchanger 1AE205
(3) RHR compartment unit coolers 1AV210, 1CV210, 1EV210, and 1GV210
(4) Flow transmitters FT-11-011A, FT-11-011B, and FT-11-013A for ESW supply and return headers
(5) ESW loop "A" valves (HV-11-041, HV-11-071, HV-11-121, and HV-11-123)
(6) Rigid steel conduit containing cables associated with the following components:
   a. RCIC turbine exhaust containment isolation valve (HV-49-1F060)
   b. Motor control center 10B217

(7) Cable trays containing cables associated with the following components:
    a. RCIC turbine exhaust containment isolation valve (HV-49-1F060)
    b. Diesel-generator control board 1AC514
    c. Diesel-generator HVAC control panel 1AC563
    d. ESW supply and return valves for diesel-generator 1A (HV-11-131A, HV-11-132A, HV-11-133A, and HV-11-134A)

(c) Postulated fire in area:

Leakage of lube oil from both RHR pump motors onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RHR loop "A"
(2) Loss of LPCI injection capability using RHR pump "C"
(3) Loss of RCIC system
(4) Loss of containment hydrogen recombiner 1AS403
(5) Loss of core spray injection capability through loop "A"
(6) Loss of drywell unit cooler fans 1C2V212 and 1G2V212
(7) Loss of diesel-generator 1A

The existence of unrated metal panels in the ceiling of this fire area is acceptable because the low combustible loadings in the areas above and below the panels and the height of the panels above the floor (40 feet) preclude the possibility of fire propagating through the panels. Penetrations of piping and electrical raceway through the ceiling are provided with 3-hour rated seals.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

The ESW flow transmitters located in this area are part of a leak detection system and their loss will have no effect on the operability of the ESW system. Since no other equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safety shut the plant down.

5.4.5 Fire Area 33: Reactor Core Isolation Cooling Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	W - Reinforced concrete	3 hr
	N - Reinforced concrete	3 hr
	NW - Reinforced concrete	3 hr
	NE - Reinforced concrete (primary containment wall)	3 hr
	SE - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete (part adjacent to stairwell no. 3)	2 hr
	S - Reinforced concrete (part, exterior wall)	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (ceiling contains 25 ft^2 of unrated metal blowout panels leading to area 43)	None
Access:	Watertight doors connecting to areas 32 and 34	3 hr
	Door connecting to stairwell no. 3	1.5 hr

(b) Major safety-related components in fire area:

(1) RCIC pump 10P203
(2) RCIC turbine 10S212
(3) RCIC compartment unit coolers 1AV208 and 1BV208
(4) Rigid steel conduits containing cables associated with the following components:
   a. Instrument rack 10C018 (Div. 1 RHR and Div. 1 RHRSW)
   b. Instrument rack 10C075 (RHR pump "A" discharge pressure)

c. Instrument rack 10C077 (RHR pump "C" discharge pressure)
d. ESW loop "A" flow transmitters (FT-11-011A and FT-11-013A)

(c) Postulated fire in area:

Leakage of lube oil from RCIC turbine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Loss of capability to use steam condensing mode of RHR loop "A"

The existence of unrated metal panels in the ceiling of this fire area is acceptable because the low combustible loadings in the areas above and below the panels and the height of the panels above the floor (40 feet) preclude the possibility of fire propagating through the panels. Penetrations of piping and electrical raceway through the ceiling are provided with 3-hour rated seals.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.4.6 Fire Area 34: High Pressure Coolant Injection Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	W - Reinforced concrete	3 hr
	N - Reinforced concrete	3 hr
	E - Reinforced concrete (primary containment wall)	3 hr
	SE - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (ceiling contains 160 ft² of unrated metal blowout panels leading to area 43)	None
Access:	Watertight doors connecting to areas 33 and 40	3 hr

(b) Major safety-related components in fire zone:

(1) HPCI pump 10P204
(2) HPCI turbine 10S211
(3) HPCI compartment unit coolers 1AV209 and 1BV209

(c) Postulated fire in area:

Leakage of lube oil from HPCI turbine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of HPCI system

The existence of unrated metal panels in the ceiling of this fire area is acceptable because the low combustible loadings in the areas above and below the panels and the height of the panels above the floor (40 feet) preclude the possibility of fire propagating through the panels. Penetrations of piping and electrical raceway through the ceiling are provided with 3-hour rated seals.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of HPCI system operability may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.4.7 Fire Area 35: Core Spray Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	W - Reinforced concrete	3 hr
	N - Reinforced concrete	3 hr
	E - Reinforced concrete (primary containment wall)	3 hr
	S - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete	3 hr*
Access:	Watertight door connecting to area 40	3 hr

(b) Major safety-related components in fire area:

(1) Core spray pump 1AP206
(2) Core spray compartment unit coolers 1AV211 and 1EV211

(c) Postulated fire in area:

Leakage of lube oil from core spray pump motor onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of core spray injection capability through loop "A"

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, complete loss of core spray loop "A" operability may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut the plant down.

5.4.8 Fire Area 36: Core Spray Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	W - Reinforced concrete	3 hr
	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	SE - Reinforced concrete (primary containment wall)	3 hr
	S - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete	3 hr*
Access:	Watertight door connecting to area 40	3 hr

(b) Major safety-related components in fire area:

(1) Core spray pump 1CP206
(2) Core spray compartment unit coolers 1CV211 and 1GV211

(3) Junction box containing cables associated with the following components:
   a. RHR pump 1CP202
   b. Instrument rack 10C077 (RHR pump "C" discharge pressure)
   c. RCIC leak detection temperature elements

(c) Postulated fire in area:

Leakage of lube oil from core spray pump motor onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of core spray injection capability through loop "A"
(2) Loss of LPCI injection capability using RHR pump "C"
(3) Loss of RCIC system

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of re on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.4.9 Fire Area 37: Core Spray Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

Construction		Rating
Walls:	W - Reinforced concrete	3 hr
	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
	SW - Reinforced concrete (primary containment wall)	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete	3 hr*
Access:	Watertight door connecting to area 39	3 hr

(b) Major safety-related components in fire area:

(1) Core spray pump 1DP206
(2) Core spray compartment unit coolers 1DV211 and 1HV211
(3) Junction box containing cables associated with the following components:
a. RHR pump 1DP202
b. HPCI leak detection system temperature elements

(c) Postulated fire in area:

Leakage of lube oil from core spray pump motor onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of core spray injection capability through loop "B"
(2) Loss of LPCI injection capability using RHR pump "D"
(3) Loss of HPCI system

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.4.10 Fire Area 38: Core Spray Compartment (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
	W - Reinforced concrete (primary containment wall)	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete	3 hr*
Access:	Watertight door connecting to area 39	3 hr

(b) Major safety-related components in fire area:

(1) Core spray pump 1BP206
(2) Core spray compartment unit coolers 1BV211 and 1FV211

(c) Postulated fire in area:

Leakage of lube oil from core spray pump motor onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of core spray injection capability through loop "B"

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, complete loss of core spray loop "B" operability may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both methods will remain available to safely shut the plant down.

5.4.11 Fire Area 39: Sump Room and Passageway (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete (part adjacent to stairwell no. 1)	2 hr
	E - Reinforced concrete (part)	3 hr
	S - Reinforced concrete (part, adjacent to unexcavated area)	3 hr
	S - Reinforced concrete (part)	3 hr
	W - Reinforced concrete (part, primary containment wall)	3 hr
	W - Reinforced concrete (part)	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete	3 hr*
Access:	Watertight doors connecting to areas 31, 37 and 38	3 hr
	Door connecting to stairwell no. 1	1.5 hr

(b) Major safety-related components in fire area:

(1) Containment isolation valves (HV-52-127 and HV-52-128) for suppression pool cleanup pump suction line.
(2) Instrument rack 10C076 (RHR pump "B" discharge pressure)
(3) Instrument rack 10C078 (RHR pump "D" discharge pressure)

(4) Junction box containing cables associated with the following components:
 a. RHR pump 1BP202
 b. Core spray pump 1BP206
 c. HPCI leak detection system temperature elements
 d. Instrument rack 10C014 (HPCI system)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of control of both containment isolation valves on the suppression pool cleanup pump suction line
(2) Loss of core spray injection capability through loop "B"
(3) Loss of RHR loop "B"
(4) Loss of HPCI system

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.4.12 Fire Area 40: Corridor (El. 177'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

		Construction	Rating
Walls:	N	- Reinforced concrete (part adjacent to stairwell no. 4)	2 hr
	N	- Reinforced concrete (part)	3 hr
	E	- Reinforced concrete	3 hr
	S	- Reinforced concrete	3 hr
	W	- Reinforced concrete (part)	3 hr
	W	- Reinforced concrete (part adjacent to stairwell no. 4)	2 hr
Floor:		Reinforced concrete foundation mat	3 hr
Ceiling:		Reinforced concrete	3 hr*
Access:		Watertight doors connecting to areas 34, 35 and 36	3 hr
		Door connecting to stairwell no. 4	1.5 hr
		Elevator door	0.75 hr

(b) Major safety-related components in fire area:

(1) HPCI pump discharge flow transmitters (FT-55-1N008 and FT-55-1N051)
(2) Junction boxes containing cables associated with the following components:
   a. RHR pump 1AP202
   b. Core spray pump 1AP206
   c. RCIC leak detection system temperature elements
   d. RCIC system
   e. Instrument rack 10C018 (Div. 1 RHR and Div. 1 RHRSW)
   f. Instrument rack 10C077 (RHR pump "C" discharge pressure)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of HPCI system
(2) Loss of RHR loop "A"
(3) Loss of core spray injection capability through loop "A"

(4) Loss of RCIC system

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

In order to prevent a fire in this area from affecting components associated with both of the specified shutdown methods, the junction boxes containing cables associated with components used for shutdown method A will be covered with a 2-inch thickness of a ceramic fiber blanket. This blanket will provide a 1-hour equivalent fire barrier, ensuring that shutdown method A will remain available to safely shut the plant down.

5.4.13 Fire Area 41: Reactor Enclosure Cooling Water Equipment Area (El. 201'-0")

(a) Structural and architectural design features of fire area (see Figure B-5):

	Construction	Rating
Walls:	N - Reinforced concrete (part)	3 hr
	N - Reinforced concrete (part adjacent to stairwell no. 1)	2 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
	W - Reinforced concrete	3 hr
	SW - Reinforced concrete (primary containment wall)	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr*
Access:	Door connecting to stairwell no. 1	1.5 hr
	Door connecting to area 31	3 hr

(b) Major safety-related components in fire area:

(1) Instrument rack 10C021 (Div. 2 RHR and Div. 2 RHRSW)
(2) Suppression chamber pressure transmitter (PT-57-101)
(3) ESW loop "B" valves (HV-11-044, HV-11-074, HV-11-124, HV-11-125, HV-11-126, HV-11-127 and HV-11-128)
(4) HVAC unit cooler control panels 1BC208 and 1DC208
(5) Motor control center 10B218, which serves the following components:
    a. RHR loop "D" valves
    b. RHR compartment unit coolers 1DV210 and 1HV210
    c. Core spray loop "B" valves
    d. Core spray compartment unit coolers 1DV211 and 1HV211
    e. RHRSW outlet valve from RHR "B" heat exchanger (HV-51-1F068B)
    f. Drywell unit cooler fans 1D2V212 and 1F2V212
    g. Containment hydrogen recombiner 1BS403 and associated valves
(6) Junction box containing cables associated with the following components:
    a. RCIC leak detection system temperature elements
    b. Core spray pump 1CP206
    c. RHR pump 1CP202
(7) Cable trays containing cables associated with the following components:
    a. ESW loop "B" valves (HV-11-072 and HV-11-073)
    b. HPCI system valves (HV-55-1F028 and HV-56-1F025)
    c. Core spray compartment unit coolers 1BV211 and 1FV211
    d. Core spray pump suction valve (HV-52-1F001B)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without effective fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Loss of core spray injection capability through loops "A" and "B"
(3) Loss of capability to remove heat from RHR loop "B"

(4) Loss of LPCI injection capability using RHR pumps "C" and "D"
(5) Loss of cooling water supply to components served by ESW loops "A" and "B" (except diesel-generators)
(6) Loss of unit coolers for the HPCI compartment, RHR compartment B, and core spray compartments B and D
(7) Loss of containment hydrogen recombiner 1BS403

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

In order to prevent a fire in this area from affecting components associated with both of the specified shutdown methods, the junction box containing cables associated with components used for shutdown method A will be covered with a 2-inch thickness of a ceramic fiber blanket. This blanket will provide a 1-hour equivalent fire barrier, ensuring that shutdown method A will remain available to safely shut the plant down.

5.4.14 Fire Area 42: Safeguard System Access Area (El. 201'-0")

(a) Structural and architectural design features of fire area (see Figure B-5):

		Construction	Rating
Walls:	N	- Reinforced concrete (part adjacent to stairwell no. 4)	2 hr
	N	- Reinforced concrete (part)	3 hr
	E	- Reinforced concrete	3 hr
	SE	- Reinforced concrete (primary containment wall)	3 hr
	S	- Reinforced concrete (part adjacent to stairwell no. 3)	2 hr
	S	- Reinforced concrete (part)	3 hr
	W	- Reinforced concrete (part)	3 hr
	W	- Reinforced concrete (part adjacent to stairwell no. 4)	2 hr
Floor:		Reinforced concrete	3 hr*

Ceiling:	Reinforced concrete	3 hr*
Access:	Elevator door	0.75 hr
	Doors connecting to stairwell nos. 3 and 4	1.5 hr
	Door connecting to area 32	3 hr
	Watertight door connecting to area 75	3 hr

(b) Major safety-related components in fire area:

(1) HPCI valves HV-55-1F007 (pump discharge) and HV-55-1F008 (pump discharge recirculation to condensate storage tank)
(2) RCIC valves HV-49-1F012 (pump discharge) and HV-49-1F022 (pump discharge recirculation to condensate storage tank)
(3) Instrument rack 10C014 (HPCI)
(4) HPCI level transmitters (LT-55-IN061B&F) and turbine exhaust pressure transmitters (PT-56-1N055D&H)
(5) Instrument rack 10C017 (RCIC)
(6) RCIC turbine exhaust pressure transmitters (PT-50-1N055C&G)
(7) Instrument rack 10C018 (Div. 1 RHR and Div. 1 RHRSW)
(8) Instrument rack 10C075 (RHR pump "A" discharge pressure)
(9) Instrument rack 10C077 (RHR pump "C" discharge pressure)
(10) HVAC unit cooler control panels 1AC208 and 1CC208
(11) Motor control center 10B217, which serves the following components:
   a. RHR loop "C" valves
   b. RHR compartment unit coolers 1CV210 and 1GV210
   c. Core spray pump suction valve (HV-52-1F001C)
   d. Core spray compartment unit coolers 1CV211 and 1GV211
   e. RHRSW outlet valve from RHR "A" heat exchanger (HV-51-1F068A)
   f. Drywell unit cooler fans 1C2V212 and 1G2V212
   g. Containment hydrogen recombiner 1AS403 and associated valves
(12) Rigid steel conduits containing cables associated with the following components:
   a. HPCI system valves, flow transmitters, and level transmitters
   b. RCIC system valves
   c. ESW loop "A" flow transmitters (FT-11-011A and FT-11-013A)

(13) Junction box containing cables associated with temperature elements for HPCI compartment unit coolers

(14) Cable tray containing cables associated with the following components:
a. RCIC components (barometric condenser vacuum pump 10P219, barometric condenser condensate pump 10P220, valves, and instrumentation)
b. RHR loop "A" minimum flow recirculation valve (HV-51-1F007A)
c. Core spray pump suction valve (HV-52-1F001A)
d. ESW loop "A" valves (HV-11-041, HV-11-071, HV-11-121, HV-11-123, and HV-11-106A&B)
e. RCIC compartment unit cooler 1AV208
f. Core spray compartment unit coolers 1AV211 and 1EV211
g. ESW supply and return valves to diesel-generator 1A (HV-11-131A, HV-11-132A, HV-11-133A, and HV-11-134A)
h. Diesel-generator control board 1AC514

(c) Postulated fire in Area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Loss of HPCI system
(3) Loss of core spray injection capability through loop "A"
(4) Loss of RHR loop "A" minimum flow recirculation
(5) Loss of capability to remove heat from RHR loop "A"
(6) Loss of LPCI injection capability using RHR pump "C"
(7) Loss of cooling water supply to components served by ESW loops "A" and "B" (except diesel-generators)
(8) Loss of diesel-generator 1A
(9) Loss of unit coolers for the RCIC compartment, RHR compartment A, and core spray compartments A and C
(10) Loss of containment hydrogen recombiner 1AS403

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Of the various safety-related systems that have components located in this fire area, only the HPCI system is associated with shutdown method B. Therefore, the remaining systems associated with shutdown method B can be used to shut the reactor down, and full shutdown capability will be retained if a system other than HPCI is available to depressurize the reactor. This depressurization function can be provided by manual actuation of the automatic depressurization system (ADS). When shutting down the reactor without the aid of either the RCIC system or the HPCI system, the ADS serves to permit the operation of a low pressure core cooling system, rather than just allowing initiation of the shutdown cooling mode of the RHR system. With this scheme of operation, two RHR pumps will need to be operated simultaneously, in which case the following components must be available in addition to those listed under "Method B" in Section 5.2.2:

(1) RHR pump "D" and associated valves
(2) RHR compartment unit cooler "D"

Since none of the above components (or their associated cabling) is located in this fire area, their availability in the event of a fire is assured.

Safe shutdown of the plant using shutdown method B modified as described above would be accomplished in the following manner. After closure of the main steam isolation valves, the reactor is depressurized by manually controlling the valves of the automatic depressurization system. The opening of these valves allows reactor steam to be discharged to the suppression pool. Makeup water is supplied to the reactor vessel from the suppression pool by operating one loop of the RHR system in the LPCI mode after reactor pressure has decreased to a nominal 295 psig. Heat is removed from the suppression pool by operating a different loop of the RHR system in the suppression pool cooling mode. In this mode, water from the suppression pool is circulated through an RHR heat exchanger and then returned to the suppression pool. When the reactor has been depressurized below a nominal 75 psig, the RHR loop operating in the suppression pool cooling mode is switched to the shutdown cooling mode. In both of these modes, heat is removed from the RHR heat exchanger by the RHRSW system, which in turn dissipates heat at the spray pond. The shutdown cooling mode of RHR will maintain the reactor in a cold shutdown condition.

5.4.15 Fire Area 43: Safeguard System Isolation Valve Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete (part)	3 hr
	S -	Reinforced concrete (exterior wall, contains 150 ft² of unrated blowout panels)	None
	W -	Concrete masonry unit	3 hr
		Interior boundary - Reinforced concrete (primary containment wall)	3 hr
Floor:		Reinforced concrete (contains 450 ft² of unrated metal blowout panels from areas 31, 32, 33, and 34)	None
Ceiling:		Reinforced concrete	3 hr*
Access:		Two steamtight doors connecting to area 44	3 hr**

(b) Major safety-related components in fire area:

(1) HPCI steam line containment isolation valves (HV-55-1F003 and HV-55-1F100)
(2) RCIC steam line containment isolation valves (HV-49-1F008 and HV-49-1F076)
(3) RHR system valves:
HV-51-1F008 (shutdown cooling suction containment isolation)
HV-51-1F015A&B (shutdown cooling return containment isolation)
HV-51-1F047A&B (heat exchanger inlet)
HV-C-51-1F048A&B (heat exchanger bypass)
HV-51-1F052A&B and HV-51-153 A&B (steam inlet shutoff)
HV-51-1F023 (head spray containment isolation)

(4) Containment atmospheric control system purge isolation valves (HV-57-121, HV-57-122, HV-57-123, HV-57-124, HV-57-125, HV-57-163, and HV-57-164)
(5) Primary containment instrument gas system supply line containment isolation valve (HV-59-135)
(6) HPCI system leakage detection temperature elements
(7) RCIC system leakage detection temperature elements
(8) Rigid steel conduits containing cables associated with the following components:
    a. Drywell unit cooler fans 1A1V212, 1B1V212, 1C1V212, 1D1V212, 1E1V212, 1F1V212, 1G1V212, and 1H1V212
    b. HPCI leak detection system temperature elements
    c. HPCI turbine exhaust pressure transmitters (PT-56-1N055D&H)
    d. RHR "A" and "C" flow transmitters
    e. RCIC system components (steam line outboard containment isolation valve, instrument rack 10C017, and instrument rack 10C038)
    f. DC power distribution panel 1DD501 (for diesel-generator 1D)
(9) Junction boxes containing cables associated with the following components:
    a. HPCI system components (turbine auxiliary oil pump, barometric condenser vacuum pump, valves, and other auxiliaries)
    b. HPCI compartment unit coolers
    c. ESW loop "B" valves
    d. RHR loop "B" flow transmitters
    e. RCIC turbine exhaust pressure transmitters
    f. Diesel-generator 1C
(10) Cable trays containing cables associated with the following components:
    a. HPCI system components (turbine auxiliary oil pump 10P213, barometric condenser condensate pump 10P215, barometric condenser vacuum pump 10P216, valves, and instrumentation)
    b. ESW loop "B" valves (HV-11-042, HV-11-043, and HV-11-103A&B)
    c. HPCI compartment unit coolers 1AV209 and 1BV209

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Loss of HPCI system
(3) Loss of RHR loops "A" and "B"
(4) Loss of RHR loop "C" minimum flow recirculation
(5) Loss of cooling water supply to components served by ESW loop "B" (except diesel-generators)
(6) Loss of diesel-generators 1C and 1D
(7) Loss of containment hydrogen recombiner 1BS403

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

RHR loops A and B are both routed through this fire area and, as indicated in (b) above, several valves are located in these portions of the RHR piping. Physical separation between the two RHR loops is achieved by routing loop A through the west side of the fire area and loop B through the east side of the fire area. The minimum separation between the valves in the two loops (or their associated cabling) within the fire area is 28 feet, which is sufficient to prevent any postulated fire from resulting in damage to both RHR loops.

Also located in this fire area are components associated with the HPCI and RCIC systems. In the event of loss of both of these systems due to a fire in this area, manual actuation of the automatic depressurization system (ADS) can be used to depressurize the reactor so that cooling water can be supplied to the reactor by the LPCI pumps. With this modification to the shutdown methods described in Section 5.2.2, the shutdown procedure would be the same as the alternate shutdown procedure discussed in item (f) of Section 5.4.14 (fire area 42). When using this alternate procedure with shutdown method A, the following components are required in addition to those items of equipment listed under "Method A" in Section 5.2.2:

(1) RHR pump "C" and associated valves
(2) RHR compartment unit cooler "C"

When using this alternate procedure with shutdown method B, the following components are required in addition to those items of equipment listed under "Method B" in Section 5.2.2:

(1) RHR pump "D" and associated valves
(2) RHR compartment unit cooler "D"

The outboard isolation valve for the RHR shutdown cooling suction line is located in this fire area, and must be opened in order to initiate shutdown cooling regardless of which RHR loop is used. If the cabling to this valve is damaged by fire, the valve will be opened manually using the attached handwheel. Since the reactor can be maintained subcritical and adequately cooled in the hot shutdown mode without using the shutdown cooling mode of RHR, ample time is available for plant personnel to open the valve.

Using the alternate shutdown procedures described above and in item (f) of Section 5.4.14, the capability to achieve safe shutdown of the plant in the event of a fire in fire area 43 is assured.

5.4.16 Fire Area 44: Safeguard System Access Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N	- Reinforced concrete (parts adjacent to stairwell nos. 1 and 4)	2 hr
	N	- Reinforced concrete (part)	3 hr
	E	- Reinforced concrete (part adjacent to stairwell no. 1)	2 hr
	E	- Reinforced concrete (part)	3 hr
	S	- Reinforced concrete (part adjacent to stairwell no. 3)	2 hr
	S	- Reinforced concrete (part, exterior wall)	3 hr
	W	- Reinforced concrete (part adjacent to stairwell nos. 3 and 4)	2 hr
	W	- Reinforced concrete (part)	3 hr
	Interior boundary (part) -	Reinforced concrete and concrete	3 hr

	masonry unit walls	
	Interior boundary (part) - Reinforced concrete (primary containment wall)	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr*
Access:	Doors connecting to stairwell nos. 1, 3, and 4	1.5 hr
	Two steamtight doors connecting to area 43	3 hr **
	Door connecting to area 76	3 hr
	Equipment airlock door	None
	Elevator door	0.75 hr
	Suppression chamber access hatches	None

(b) Major safety-related components in fire area:

(1) Core spray full flow test recirculation valves (HV-52-1F015A&B)
(2) Containment atmospheric control system purge line isolation valves (HV-57-103, HV-57-104, HV-57-105, and HV-57-162)
(3) RHR system valves:
HV-51-125A&B (containment isolation for recirculation to suppression chamber)
HV-51-1F027A&B (containment isolation for suppression chamber spray)
HV-51-1F010A&B (loops C and D recirculation to suppression chamber)
HV-51-1F024A&B (loops A and B recirculation to suppression chamber)
(4) Instrument racks 10C001 (core spray loop A) and 10C019 (core spray loop B)
(5) Instrument racks 10C015, 10C025, 10C041, and 10C042 (main steam and reactor recirculation flow)
(6) Instrument racks 10C016 and 10C036 (HPCI)
(7) Instrument racks 10C035 and 10C038 (RCIC)
(8) Instrument racks 10C006, 10C009, 10C010, and 10C022 (reactor recirculation system pressure and jet pump flow)
(9) RHR flow transmitters (FT-51-1N015A,B,C&D and FT-51-1N052A,B,C&D)
(10) Motor control center 10B211, which serves the following components:
a. RHR loop "A" valves
b. RHR compartment unit coolers 1AV210 and 1EV210
c. Core spray loop "A" valves
d. Core spray compartment unit coolers 1AV211 and 1EV211

e. RHRSW inlet valve to RHR "A" heat exchanger (HV-51-1F014A)
f. Reactor head spray inboard isolation valve (HV-51-1F022)
g. RHR shutdown cooling suction inboard isolation valve (HV-51-1F009)
h. RCIC compartment unit coolers 1AV208 and 1BV208
i. Reactor water cleanup inboard isolation valve (HV-44-1F001)
j. Main steam drain line inboard isolation valve (HV-41-1F016)
k. Drywell unit cooler fans 1A1V212, 1C1V212, 1E1V212, and 1G1V212

(11) Motor control center 10B212, which serves the following components:
a. RHR loop "B" valves
b. RHR compartment unit coolers 1BV210 and 1FV210
c. Core spray loop "B" valves
d. Core spray compartment unit coolers 1BV211 and 1FV211
e. RHRSW inlet valve to RHR "B" heat exchanger (HV-51-1F014B)
f. RHR shutdown cooling return isolation valve (HV-51-1F015A)
g. Reactor recirculation pump suction valve (HV-43-1F023B)
h. HPCI compartment unit coolers 1AV209 and 1BV209
i. Drywell unit cooler fans 1B1V212, 1D1V212, 1F1V212, and 1H1V212

(12) Motor control center 10B215, which serves the following components:
a. RHR loop "A" valves
b. RCIC system valves
c. MSIV leakage control outboard system blowers and valves
d. Suppression pool cleanup pump suction isolation valve (HV-52-127)
e. Drywell pressure tap isolation valve (HV-42-147A)
f. Drywell floor drain and equipment drain containment isolation valves (HV-61-112 and HV-61-132)

(13) Motor control center 10B216, which serves the following components:
a. RHR loop "B" valves
b. HPCI system valves
c. MSIV leakage control inboard system blower and valves
d. Suppression pool cleanup pump isolation valve (HV-52-128)

e. Drywell pressure tap isolation valve
f. Suppression pool level tap isolation valves (HV-55-120 and HV-55-121)
g. Reactor head spray outboard isolation valve (HV-51-1F023)
h. RHR shutdown cooling suction outboard isolation valve (HV-51-1F008)
i. RWCU outboard isolation valve (HV-44-1F004)
j. Main steam drain line outboard isolation valve (HV-41-1F019)

(14) DC motor control center 10D201, which serves the following components:
a. RCIC system
b. Div. 1 RPS and UPS static inverter

(15) DC motor control center 10D202, which serves the HPCI system

(16) DC motor control center 10D203, which serves the following components:
a. HPCI system
b. Div. 2 RPS and UPS static inverter

(17) Rigid steel conduits containing cables associated with the following components:
a. Diesel-generators 1A, 1B, 1C, and 1D
b. DC distribution panels 1AD501, 1BD501, 1CD501, and 1DD501, which serve the diesel-generators
c. Load center transformer 10X203 (Div. 3)
d. Drywell unit cooler fans 1A1V212, 1B1V212, 1C1V212, 1D1V212, 1E1V212, 1F1V212, 1G1V212, and 1H1V212
e. Instrument rack 10C021 (Div. 2 RHR and Div. 2 RHRSW)
f. Instrument rack 10C075 (RHR pump A discharge pressure)
g. Instrument rack 10C076 (RHR pump B discharge pressure)
h. Instrument rack 10C078 (RHR pump D discharge pressure)
i. ESW loop "B" valves
j. ESW loop "A" flow transmitters (FT-11-011A and FT-11-013A)
k. HPCI system components (flow transmitters and level transmitters)
l. RCIC system components (steam line isolation valve, leak detection system, and instrument rack 10C017)
m. Instrument ac transformer 10X108 (Div. 3)
n. RHR shutdown cooling suction isolation valve
o. LPCI injection isolation valve (HV-51-1F017A)
p. RHR compartment unit coolers 1DV210 and 1HV210

(18) Junction boxes containing cabling associated with the following components:
  a. Diesel-generators 1A, 1B, 1C, and 1D
  b. DC distribution panels 1AD501, 1BD501, and 1CD501, which serve the diesel-generators
  c. ESW supply and return valves to diesel-generators 1A and 1B (HV-11-131A&B, HV-11-132A&B, HV-11-133A&B, and HV-11-134A&B)
  d. Motor control center 10B515 (serving diesel-generator 1A)
  e. Diesel-generator HVAC control panel 1AC563
  f. RHR pump 1AP202
  g. Core spray pump 1AP206
  h. HPCI system components (valves, level switches, pressure transmitters, leak detection system, and instrument rack 10C014)
  i. RCIC leakage detection system

(19) Cable trays containing cables associated with the following components:
  a. RCIC system valves and instrumentation
  b. HPCI system valves and instrumentation
  c. Core spray loop "A" valves and instrumentation
  d. Core spray loop "B" valves
  e. RHR loop "A" valves and instrumentation
  f. RHR loop "B" valves
  g. RHR loop "C" valves
  h. RHR loop 'D' valves and instrumentation
  i. RHRSW outlet valve from RHR "A" heat exchanger (HV-51-1F068A)
  j. RHRSW outlet valve from RHR "B" heat exchanger (HV-51-1F068B)
  k. ESW loop "A" valves
  l. ESW loop "B" valves
  m. Diesel-generators 1A and 1B
  n. Load center 10B201 (Div. 1)
  o. Diesel-generator cell HVAC control panel 1AC563
  p. Reactor protection system channel "A" vertical board 10C609
  q. Containment hydrogen recombiner 1AS403 and associated valves
  r. Inlet valve to containment hydrogen recombiner 1BS403 (HV-57-163)
  s. Drywell unit cooler fans 1A2V212, 1C2V212, 1D2V212, 1E2V212, 1F2V212, and 1G2V212

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Loss of HPCI system
(3) Loss of core spray injection capability through loops "A" and "B"
(4) Loss of RHR loops "A" and "B"
(5) Loss of LPCI injection capability using RHR pumps "C" and "D"
(6) Loss of capability to remove heat from RHR loops "A" and "B"
(7) Loss of cooling water supply to components served by ESW loops "A" and "B" (except diesel-generators)
(8) Loss of diesel-generators 1A, 1B, 1C, and 1D
(9) Loss of Class IE ac power supplied by load centers 10B201 (Div. 1) and 10B203 (Div. 3)
(10) Loss of Class IE ac power supplied by instrument ac distribution panel 10Y202 (Div. 4)
(11) Possible MSIV closure
(12) Loss of containment hydrogen recombiners 1AS403 and 1BS403
(13) Loss of drywell unit coolers 1AV212, 1CV212, 1DV212, 1EV212, 1FV212, and 1GV212
(14) Loss of MSIV leakage control system
(15) Loss of RWCU system

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

This fire area contains valves, motor control centers, instrument racks, and locally-mounted instrumentation associated with shutdown methods A and B. In general, the components associated with shutdown method A are located in the western portion of the fire area, and the components associated with shutdown method B are located in the eastern portion of the fire area. The only exceptions to this generalization are the instrument racks associated with the HPCI system (racks 10C016 and 10C036) and the RCIC system (racks 10C035 and 10C038).

By using the alternate shutdown procedure discussed in item (f) of Section 5.4.14, operability of the HPCI and RCIC systems need not be relied upon. When using this alternate procedure with shutdown method A, the following components are required in addition to those components listed under "Method A" in Section 5.2.2:

(1) RHR pump "C" and associated valves
(2) RHR compartment unit cooler "C"

When using this alternate procedure with shutdown method B, the following components are required in addition to those components listed under "Method B" in Section 5.2.2:

(1) RHR pump "D" and associated valves
(2) RHR compartment unit cooler "D"

The electrical raceways in this fire area have been routed so that raceways associated with shutdown method A are located primarily in the western portion of the area, and raceways associated with shutdown method B are located primarily in the eastern portion of the area, thereby maximizing physical separation between the cables of the two shutdown methods. For those cases in which raceways associated with the two shutdown methods are separated by less than 20 feet, the raceways of both shutdown methods will be covered by a 1-inch thickness of a ceramic fiber blanket. For those cases in which electrical cabling associated with one shutdown method is separated from components associated with the other shutdown method by less than 20 feet, the cabling involved will be covered by a 2-inch thickness of a ceramic fiber blanket. These blankets will provide a 1-hour equivalent fire barrier for a 2-inch thickness, and a 30-minute equivalent fire barrier for a 1-inch thickness, ensuring that a postulated fire in this area will not result in damage to cabling associated with more than one of the shutdown methods.

The measures described above for physical separation and provision of fire barriers ensure that at least one of the two shutdown methods (A and B) described in Section 5.2.2 will remain available to safely shut the plant down in the event of a fire.

5.4.17 Fire Area 45: CRD Hydraulic Equipment Area and Neutron Monitoring System Area (El. 253'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

	Construction	Rating
Walls:	N - Reinforced concrete (parts adjacent to stairwell nos. 1 and 4)	2 hr
	N - Reinforced concrete (part)	3 hr
	E - Reinforced concrete (part adjacent to stairwell no. 1)	2 hr
	E - Reinforced concrete (part)	3 hr
	S - Reinforced concrete (part adjacent to stairwell no. 3)	2 hr
	S - Reinforced concrete (part, exterior wall)	3 hr
	W - Reinforced concrete (parts adjacent to stairwell nos. 3 and 4)	2 hr
	W - Reinforced concrete (part)	3 hr
	Interior boundary (part adjacent to main steam tunnel) - Reinforced concrete	3 hr
	Interior boundary (part) - Reinforced concrete (primary containment wall)	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr*
Access:	Doors connecting to stairwell nos. 1, 3, and 4	1.5 hr
	Elevator door	0.75 hr
	Drywell access hatches	None
	Watertight door connecting to area 46	3 hr

(b) Major safety-related components in fire area:

(1) Drywell chilled water system valves HV-87-122, HV-87-123, HV-87-128, and HV-87-129 (supply and return line containment isolation)
(2) Control rod drive system master control station
(3) Control rod drive system hydraulic control units
(4) Containment combustible gas analyzer sample package 10S206
(5) Load center 10B203 (Div. 3)
(6) MSIV leakage control system blowers 10K208, 1AK209, and 1EK209
(7) Instrument racks 10C004, 10C005, 10C026, and 10C027 (RPV instrumentation and LPCI injection valve ΔP transmitters)

(8) RHRSW radiation monitors 0AS578, 1CS579, and 1DS579

(9) Motor control center 10B223, which serves the following components:

a. LPCI injection containment isolation valve (HV-51-1F017C)
b. RHR loop "C" minimum flow recirculation isolation valve (HV-51-105A)
c. RCIC system valves
d. Standby liquid control pump 1AP208
e. Standby liquid control injection outboard isolation valve (HV-48-1F006)
f. Drywell pressure tap isolation valve (HV-42-147C)
g. Drywell unit cooler fans 1A2V212 and 1E2V212
h. Reactor recirculation pump cooling water isolation valves (HV-13-106 and HV-13-107)

(10) Motor control center 10B224, which serves the following components:

a. LPCI injection containment isolation valve (HV-51-1F017D)
b. RHR loop "D" minimum flow recirculation isolation valve (HV-51-105B)
c. HPCI system valves
d. Standby liquid control pump 1BP208
e. Drywell pressure tap isolation valve (HV-42-147D)
f. Reactor recirculation pump cooling water source select valves (HV-13-108, HV-13-109, HV-13-110, and HV-13-111)
g. Drywell unit cooler fans 1B2V212 and 1H2V212

(11) Rigid steel conduits containing cables associated with the following components:

a. HPCI system components (flow transmitters, level transmitters, and instrument rack 10C036)
b. RHR loop "A" components (LPCI injection isolation valve and flow transmitters)
c. Instrument rack 10C017 (RCIC)
d. Instrument rack 10C019 (core spray)
e. Instrument rack 10C021 (Div. 2 RHR and Div. 2 RHRSW)
f. Instrument rack 10C075 (RHR pump "A" discharge pressure)
g. Instrument rack 10C076 (RHR pump "B" discharge pressure)
h. Motor control center 10B516 (Div. 2)
i. Containment hydrogen recombiners 1AS403 and 1BS403
j. ESW loop "A" flow transmitters (FT-11-011A and FT-11-013A)
k. ESW loop "B" flow transmitter (FT-11-011B)

(12) Junction boxes containing cables associated with the following components:
   a. Load center transformer 10X204 (Div. 4)
   b. Motor control centers 10B211 (Div. 1), 10B212 (Div. 2), 10B218 (Div. 4), 10B515 (Div. 1), 10B516 (Div. 2), and 10B518 (Div. 4)
   c. ESW supply and return valves for diesel-generators 1C and 1D
   d. Diesel-generator control boards 1CC514 and 1DC514
   e. Diesel-generator cell HVAC control panels 1CC563 and 1DC563

(13) Cable trays containing cables associated with the following components:
   a. RCIC system valves and instrumentation
   b. HPCI system valves and instrumentation
   c. Core spray loop "A" valves and instrumentation
   d. Core spray loop "B" valves and instrumentation
   e. RHR loop "A" valves, instrumentation, and pump 1AP202
   f. RHR loop "B" valves and instrumentation
   g. RHR loop "C" valves and instrumentation
   h. RHR loop "D" valves and instrumentation
   i. RHRSW outlet valve from RHR "A" heat exchanger (HV-51-1F068A)
   j. RHRSW outlet valve from RHR "B" heat exchanger (HV-51-1F068B)
   k. RHRSW pump 0AP506
   l. ESW loop "A" valves and pump 0AP548
   m. ESW loop "B" valves and pump 0DP548
   n. Diesel-generators 1A, 1B, 1C, and 1D
   o. Diesel-generator cell HVAC control panels 1AC563, 1CC563, and 1DC563
   p. Load centers 10B201 (Div. 1), 10B202 (Div. 2), and 10B203 (Div. 3)
   q. Reactor protection system channel "A" vertical board 10C609 and channel "B" vertical board 10C611
   r. Main steam relief valves (non-ADS)
   s. ADS channel "A" and "C" solenoid pilot valves
   t. Inboard MSIVs
   u. Drywell unit cooler fans 1A1V212, 1A2V212, 1B1V212, 1C1V212, 1C2V212, 1D1V212, 1E1V212, 1E2V212, 1F1V212, 1G1V212, 1G2V212, and 1H1V212
   v. Containment hydrogen recombiner 1AS403 and associated valves
   w. Inlet valve to containment hydrogen recombiner 1BS403 (HV-57-163)
   x. Control structure water chiller OBK112

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Loss of HPCI system
(3) Loss of core spray injection capability through loops "A" and "B"
(4) Loss of RHR loops "A" and "B"
(5) Loss of LPCI injection capability using RHR pumps "C" and "D"
(6) Loss of capability to remove heat from RHR loops "A" and "B"
(7) Loss of ESW loops "A" and "B"
(8) Loss of diesel-generators 1A, 1B, 1C, and 1D
(9) Loss of Class IE ac power supplied by load center 10B201 (Div. 1), 10B202 (Div. 2), 10B203 (Div. 3), and 10B204 (Div. 4)
(10) Loss of Class IE ac power supplied by instrument ac distribution panels 10Y101 (Div. 1) and 10Y102 (Div. 2)
(11) Loss of capability to manually actuate the MSRVs, both ADS and non-ADS related
(12) Possible closure of MSIVs
(13) Loss of reactor pressure and reactor water level recorders "A" and "B"
(14) Loss of containment hydrogen recombiners 1AS403 and 1BS403
(15) Loss of standby liquid control system
(16) Loss of containment combustible gas sample cabinet 10S206
(17) Loss of MSIV leakage control system
(18) Loss of RWCU system
(19) Loss of cooling water supply to reactor recirculation pumps
(20) Loss of all drywell unit coolers

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the fire is in the area of the drywell electrical penetrations, wet pipe sprinkler systems will provide automatic suppression of the fire. At 212°F, individual fusible link sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

This fire area contains two instrument racks, two motor control centers, and one load center that are associated with shutdown methods A and B. The minimum separation between those components associated with shutdown method A and those associated with shutdown method B is greater than 50 feet.

The electrical raceways routed through this fire area carry cables for a number of components associated with shutdown methods A and B, in addition to cables for the components discussed in the preceding paragraph. For those cases in which raceways associated with the two shutdown methods are separated by less than 20 feet, the raceways of both shutdown methods will be covered by a 1-inch thickness of a ceramic fiber blanket. For those cases in which electrical cabling associated with one shutdown method is separated from components associated with the other shutdown method by less than 20 feet, the cabling involved will be covered by a 2-inch thickness of a ceramic fiber blanket. These blankets will provide a 1-hour equivalent fire barrier for a 2-inch thickness, and a 30-minute equivalent fire barrier for a 1-inch thickness.

The measures described above for physical separation and provision of fire barriers ensure that at least one of the two shutdown methods (A and B) described in Section 5.2.2 will remain available to safely shut the plant down in the event of a fire.

5.4.18 Fire Area 46: Main Steam Tunnel (El. 253'-0")

(a) Structural and architectural design features of fire area (see Figures B-7, B-8, B-9, and B-10):

		Construction	Rating
Walls:	N -	Reinforced concrete (contains 188 ft² of unrated metal blowout panels)	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete (part, primary containment wall)	3 hr
	S -	Reinforced concrete (part)	3 hr

	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete (part at El. 295'-3")	3 hr*
	Reinforced concrete (part at El. 365' roof slab)	None
Access:	Watertight door connecting to area 45	3 hr
	Steamtight doors connecting to areas 28 and 47	3 hr**

(b) Major safety-related components in fire area:

(1) Main steam line outboard containment isolation valves (HV-41-1F028 A,B,C&D)
(2) Feedwater line outboard containment isolation valves (HV-41-1F022A&B and HV-41-1F074A&B)
(3) Main steam drain line outboard containment isolation valve (HV-41-1F019)
(4) MSIV-LCS outboard containment isolation valves (HV-40-1F001B,F,K&P and HV-40-1F002B,F,K&P)
(5) RCIC injection valve (HV-49-1F013)
(6) Steam line radiation sensors (RE-41-1N006A,B,C&D)

(c) Postulated fire in area:

Since no combustible materials are located in this area, the origin of a postulated fire is indeterminate.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Possible closure of MSIVs
(3) Loss of outboard portion of MSIV leakage control system

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will shut the reactor down. The plant fire brigade will be dispatched to elevations 253 and/or 283 feet in the reactor enclosure and will enter the main steam tunnel through doors at those elevations. The fire brigade will extinguish the fire using portable fire extinguishers or hoses from hose stations located outside the entrances to the main steam tunnel.

Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain avialble to safely shut the plant down.

5.4.19 Fire Area 47: RWCU Compartments, FPCC Compartment, and General Equipment Area (El. 283'-0" and 295'-3")

(a) Structural and architectural design features of fire area (see Figure B-8):

	Construction	Rating
Walls:	N - Reinforced concrete (parts adjacent to stairwell nos. 1 and 4)	2 hr
	N - Reinforced concrete (part)	3 hr
	E - Reinforced concrete (part adjacent to stairwell no. 1)	2 hr
	E - Reinforced concrete (part)	3 hr
	S - Reinforced concrete (part adjacent to stairwell no. 3)	2 hr
	S - Reinforced concrete (part, exterior wall)	3 hr
	W - Reinforced concrete (parts adjacent to stairwell nos. 3 and 4)	2 hr
	W - Reinforced concrete (part)	3 hr
	Interior boundary (east and west walls of area 46) - Reinforced concrete	3 hr
	Interior boundary (primary containment wall) - Reinforced concrete	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete	3 hr*
Access:	Doors connnecting to stairwell nos. 1, 3, and 4	1.5 hr
	Steamtight door connecting to area 46	3 hr**
	Elevator door	0.75 hr

(b) Major safety-related components in fire area:

(1) Containment hydrogen recombiner packages 1AS403 and 1BS403
(2) Standby liquid control system components:
    Storage tank 10T204
    Injection pumps 1AP208 and 1BP208
    Explosive valves XV-48-1F004A&B
(3) Core spray loop "A" injection valves (HV-52-1F004A and HV-52-1F005)
(4) Core spray loop "B" injection valves (HV-52-1F004B, HV-52-1F037, and HV-52-108)
(5) RHR system valves:
    HV-51-1F017A,B,C&D (LPCI injection line containment isolation)
    HV-51-1F021A&B (drywell spray line containment isolation)
    HV-51-1F016A&B (drywell spray line shutoff)
(6) HPCI system injection valve (HV-55-1F006)
(7) RWCU supply line containment isolation valve (HV-44-1F004)
(8) Containment atmospheric control system purge line containment isolation valves (HV-57-111, HV-57-113, HV-57-114, and HV-57-161)
(9) Containment combustible gas analyzer sample cabinet 10S205
(10) Load center 10B204 (Div. 4)
(11) HVAC 120V ac distribution panel 10Y206 (Div. 1), which serves the following components:
    a. Diesel-generator enclosure HVAC control panel 1AC563
    b. Unit cooler control panel 1AC208
    c. Control structure HVAC local panel 0CC101
    d. SGTS control panel 0AC124
    e. RERS control panel 10C207
(12) HVAC 120V ac distribution panel 10Y207 (Div. 2), which serves the following components:
    a. Diesel-generator enclosure HVAC control panel 1BC563
    b. Unit cooler control panel 1BC208
    c. Control structure HVAC local panel 0CC101
    d. SGTS control panel 0BC124
    e. RERS control panel 10C207
(13) Motor control center 10B213, which serves the following components:
    a. RHR loop "A" valves
    b. Core spray loop "A" valves
    c. Feedwater startup recirculation valves (HV-41-109A&B)
    d. Shutoff valves for main steam to miscellaneous steam-driven components (HV-01-108, HV-01-109, HV-01-111, and HV-01-150)

e. Drywell chilled water source select valves
f. SGTS heater 0AE188
g. SGTS exhaust fan 0AV109

(14) Motor control center 10B214, which serves the following components:
a. RHR loop "B" valves
b. Core spray loop "B" valves
c. MSIV leakage control inboard system pipe heaters and isolation valves
d. Drywell cooling water containment isolation valves
e. SGTS heater 0BE1088
f. SGTS exhaust fan 0BV109

(15) Rigid steel conduits containing cables associated with the following components:
a. Motor control centers 10B212 (Div. 2), 10B515 (Div. 1), 10B516 (Div. 2), and 00B520 (Div. 2)
b. Core spray pump 1BP206
c. Safeguard pump room unit cooler control panels 1CC208 and 1DC208
d. Diesel-generator cell HVAC control panel 1CC563
e. Instrument rack 10C004 (RPV instrumentation and LPCI injection valve "A" ΔP transmitter)
f. Instrument rack 10C021 (Div. 2 RHR and Div. 2 RHRSW)
g. Instrument rack 10C076 (RHR pump "B" discharge pressure)
h. HPCI system level transmitters (LT-55-1N062B&F)
i. Outboard main steam isolation valves
j. MSIV leakage control system valves

(16) Junction boxes containing cables associated with the following components:
a. Load center transformer 10X201 (Div. 1)
b. Motor control centers 00B131 (Div. 3) and 00B519 (Div. 1)
c. Instrument rack 10C005 (RPV instrumentation and LPCI injection valve "C" ΔP transmitter)
d. HPCI injection valve (HV-55-1F006)

(17) Cable trays containing cables associated with the following components:
a. RCIC system valves and instrumentation
b. HPCI system valves and instrumentation
c. Core spray pump suction valve (HV-52-1F001C)
d. Core spray loop "B" instrumentation
e. RHR loop "C" valves and instrumentation
f. RHR loop "D" valves and instrumentation
g. RHRSW outlet valve from RHR "A" heat exchanger (HV-51-1F068A)
h. ESW loop "A" valves (HV-11-071 and HV-11-123)

i. ESW supply and return shutoff valves for diesel-generator 1C (HV-11-131C, HV-11-132C, HV-11-133C, and HV-11-134C)
j. Diesel-generators 1C and 1D
k. Diesel-generator cell HVAC control panel 1DC563
l. ADS channel "A" and "C" solenoid pilot valves
m. Instrument ac transformer 10X108 (Div. 3)
n. Instrument ac distribution panel 10Y201 (Div. 3)
o. Drywell unit cooler fans 1A2V212, 1C2V212, 1E2V212, and 1G2V212
p. Reactor recirculation pump cooling water isolation valves (HV-13-106 and HV-13-107)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of RCIC system
(2) Loss of HPCI system
(3) Loss of core spray injection capability through loops "A" and "B"
(4) Loss of RHR loops "A" and "B"
(5) Loss of LPCI injection capability through loops "A" and "B"
(6) Loss of RHRSW loops "A" and "B"
(7) Loss of cooling water supply to components served by ESW loop "A" (except diesel-generators 1A, 1B, and 1D)
(8) Loss of ventilation for diesel-generator cells 1A and 1B
(9) Loss of diesel-generators 1A, 1B, 1C, and 1D
(10) Loss of Class IE ac power supplied by load centers 10B201 (Div. 1) and 10B204 (Div. 4)
(11) Loss of Class IE ac power supplied by instrument ac distribution panels 10Y102 (Div. 2), 10Y103 (Div. 3), and 10Y201 (Div. 3)
(12) Possible closure of outboard MSIVs
(13) Loss of reactor pressure and reactor water level recorder "A"
(14) Loss of containment hydrogen recombiners 1AS403 and 1BS403
(15) Loss of standby liquid control system

(16) Loss of containment combustible gas sample cabinet 10S205
(17) Loss of MSIV leakage control system
(18) Loss of RWCU system
(19) Loss of standby gas treatment system
(20) Loss of reactor enclosure recirculation system
(21) Loss of cooling water supply to reactor recirculation pumps
(22) Loss of cooling water to drywell unit coolers

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the fire is in the area of the drywell electrical penetrations, wet pipe sprinkler systems will provide automatic suppression of the fire. At 212°F, individual fusible link sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Valves, motor control centers, ac power distribution panels, and a load center associated with shutdown methods A and B are located within this fire area. The electrical raceways routed through this area carry cables for a number of components which are associated with shutdown methods A or B and which are located in other fire areas. In general, the components and raceways associated with shutdown method A are located in the western portion of the fire area, and the components and raceways associated with shutdown method B are located in the eastern portion of the fire area. However, there are several raceways associated with shutdown method A that are routed through the eastern portion of the fire area. The portions of these raceways that are located in the eastern portion of the fire area will be covered by a 2-inch thickness of a ceramic fiber blanket, providing a 1-hour equivalent fire barrier. Cabling associated with both channels of ADS solenoid pilot valves are routed through this fire area. Since the ADS valves are needed for both shutdown methods, at least one of the channels of ADS cabling must remain undamaged by a postulated fire. Therefore, all raceways within this fire area that contain cables associated with the ADS valves will be covered by a 1-inch thickness of ceramic fiber blanket.

The minimum separation between those components and raceways associated with shutdown method A and those associated with shutdown method B, other than the raceways to be covered by ceramic fiber blankets, is approximately 26 feet.

The measures described above for physical separation and provision of fire barriers ensure that at least one of the two shutdown methods (A and B) described in Section 5.2.2 will remain available to safely shut the plant down in the event of a fire.

5.4.20 Fire Area 48: RWCU Holding Pump Compartments, RERS Fan Area, and Corridors (El. 313'-0")

(a) Structural and architectural design features of fire area (see Figure B-9):

		Construction	Rating
Walls:	N -	Reinforced concrete (part adjacent to stairwell no. 4)	2 hr
	N -	Reinforced concrete (part)	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete (part)	3 hr
	S -	Reinforced concrete (part adjacent to stairwell no. 3)	2 hr
	W -	Reinforced concrete (part, exterior wall)	None
	W -	Reinforced concrete (part adjacent to stairwell no. 4)	2 hr
	Interior boundary -	Reinforced concrete (primary containment wall)	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr*
Access:		Doors connecting to stairwell nos. 3 and 4	1.5 hr
		Two doors connecting to area 49	3 hr
		Elevator door	0.75 hr

(b) Major safety-related components in fire area:

(1) Reactor enclosure recirculation system fans (1AV213 and 1BV213)
(2) Load center 10B201 (Div. 1)
(3) Load center 10B202 (Div. 2)
(4) Rigid steel conduits containing cables associated with the following components:
  a. Motor control center 00B132 (Div. 4)

b. Safeguard pump room unit cooler control panel 1DC208

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of Class IE ac power supplied by load centers 10B201 (Div. 1) and 10B202 (Div. 2)
(2) Loss of reactor enclosure recirculation system
(3) Loss of core spray compartment unit coolers 1DV211 and 1HV211, potentially affecting the long term availability of core spray pump 1DP206
(4) Loss of RHR compartment unit coolers 1DV210 and 1HV210, potentially affecting the long term availability of RHR pump 1DP202

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

The only components in this fire area that are associated with shutdown methods A and B are two load centers (10B201 and 10B202) and their associated transformers. The two load centers are separated by a distance of more than 35 feet. All cabling which is associated with these load centers and is needed for safe shutdown enters the load centers from below, and therefore is not exposed in this fire area.

The separation between the two load centers is adequate to ensure that a postulated fire in this area will not cause damage to more than one of the load centers. Therefore, at least one of the two shutdown methods (A and B) described in Section 5.2.2 will remain available to safely shut the plant down.

5.4.21 Fire Area 49: Reactor Enclosure Lower Fan Room (El. 313'-0")

(a) Structural and architectural design features of fire area (see Figure B-9):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete (part, exterior wall)	None
	S -	Louvers open to outside atmosphere (part)	None
	W -	Reinforced concrete	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	None
Access:		Two doors connecting to area 48	3 hr
		Emergency exit in ceiling (6.25 ft^2 opening)	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of normal ventilation for Unit 1 portion of refueling floor
(2) Loss of normal reactor enclosure supply ventilation

(e) Consequences of fire with active fire suppression:

Once the control room operators have been notified that a fire has occurred in this area, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of the ventilation functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with either of the two shutdown methods described in Section 5.2.2 is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.4.22 Fire Area 50: Reactor Enclosure Upper Fan Room and Equipment Compartment Exhaust Filter Rooms (Fl. 331'-0")

(a) Structural and architectural design features of fire area (see Figure B-9):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete (exterior wall)	3 hr
	W -	Reinforced concrete (part adjacent to stairwell no. 3)	2 hr
	W -	Reinforced concrete (part)	3 hr
Floor:		Reinforced concrete	None
Ceiling:		Reinforced concrete	3 hr*
Access:		Door connecting to stairwell no. 3	1.5 hr
		Two doors connecting to area 51	3 hr
		Emergency exit in floor (6.25 ft² opening)	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of charcoal filters.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of normal reactor enclosure exhaust ventilation
(2) Loss of reactor enclosure equipment compartment exhaust fans

(e) Consequences of fire with active fire suppression:

In the event of a fire in one of the reactor enclosure equipment compartment exhaust filters, a heat detector inside the filter plenum will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the affected ventilation system will be shut down and the plant fire brigade will be dispatched to extinguish the fire. The fire brigade will utilize a manual valve in the fire protection water supply system to initiate operation of a water spray system inside the filter plenum.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with either of the two shutdown methods described in Section 5.2.2 is located in this fire area, both of these methods will remain available to safety shut the plant shown.

5.4.23 Fire Area 51: RERS Filter Compartments (El. 331-0")

(a) Structural and architectural design features of fire area (see Figure B-9):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete	3 hr
	W -	Reinforced concrete (exterior wall)	3 hr
Floor:		Reinforced concrete	3 hr*
Ceiling:		Reinforced concrete	3 hr*
Access:		Two doors connecting to area 50	3 hr

(b) Major safety-related components in fire area:

(1) Reactor enclosure recircualtion system filter assemblies (1AS297 and 1BS297)

(c) Postulated fire in area:

Ignition of charcoal filters.

(d) Consequences of fire without active fire suppression (based on the assumption that damage occurs to all components located in the area and all cabling routed through the area):

(1) Loss of reactor enclosure recirculation system

(e) Consequences of fire with active fire suppression:

In the event of a fire in one of the reactor enclosure recirculation system filters, a heat detector inside the filter plenum will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. The fire brigade will utilize a manual valve in the fire protection water supply system to initiate operation of a water spray system inside the filter plenum.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with either of the two shutdown methods described in Section 5.2.2 is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.4.24 Fire Area 75: Service Water Pipe Tunnel (El. 198'-0")

(a) Structural and architectural design features of fire area (see Figure B-5):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete (exterior wall)	3 hr
	W -	Reinforced concrete	3 hr
Floor:		Reinforced concrete foundation	3 hr
Ceiling:		Reinforced concrete	3 hr*

Access: Watertight doors connecting to areas 42 and 65 — 3 hr

(b) Major safety-related components in fire area:

(1) ESW discharge header isolation valves (HV-11-011A&B and HV-11-015A&B)

(c) Postulated fire in area:

Since no combustible materials are located in this area, the origin of a postulated fire is indeterminate.

(d) Consequences of fire without active fire suppression:

The only components within this fire area that are associated with the shutdown methods described in Section 5.2.2 are valves HV-11-011A and HV-11-015B. These two valves are located at opposite ends of the service water pipe tunnel and are separated by more than 200 feet. The conduits carrying cables associated with these valves are routed such that their minimum separation within the service water pipe tunnel is 100 feet. This degree of separation is sufficient to prevent any postulated fire from affecting the operability of both valves. Therefore, a fire could cause the loss of one ESW loop at most.

(e) Consequences of fire with active fire suppression:

Upon receipt of notification in the control room that a fire has occurred in this area, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of any ESW valving may be avoided.

(f) Effect of fire on safe shutdown:

As discussed in (d) above, a fire in this area could cause the loss of no more than one ESW loop. Therefore, at least one of the two shutdown methods described in Section 5.2.2 will remain available to safely shut the plant down.

5.4.25 Fire Area 76: Refueling Hoistway (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figures B-6, B-7, B-8, and B-9):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete	3 hr
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation	3 hr
Ceiling:	Concrete hatch plugs connecting to area 78	None
Access:	Doors connecting to areas 44 and 67	3 hr
	Railroad car airlock doors	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Since no combustible materials are located in this area, the origin of a postulated fire is indeterminate.

(d) Consequences of fire without active fire suppression:

Since no equipment or cabling of any significance is located in this area, a fire will have no effect on plant systems.

(e) Consequences of fire with active fire suppression:

Upon receipt of notification in the control room that a fire has occurred in this area, the plant fire brigade will be dispatched to extinguish the fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with either of the two shutdown methods described in Section 5.2.2 is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.4.26 Fire Area 77: South Ventilation Exhaust Stack

(a) Structural and architectural design features of fire area (see Figures B-7, B-8, B-9, and B-10):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Precast concrete panels	None
	S -	Precast concrete panels	None
	W -	Precast concrete panels	None
Floor:		None (open to outside)	
Ceiling:		None (open to outside)	
Access:		Door connecting to area 78	3 hr

(b) Major safety-related components located in fire area:

None

(c) Postulated fire in area:

Since no combustible materials are located in this area, the origin of a postulated fire is indeterminate.

(d) Consequences of fire without active fire suppression:

Since nothing other than HVAC ductwork is located in this area, a fire will have no effect on plant systems.

(e) Consequences of fire with active fire suppression:

Upon receipt of notification in the control room that a fire has occurred in this area, the plant fire brigade will be dispatched to extinguish the fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with either of the two shutdown methods described in Section 5.2.2 is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.4.27 Fire Area 78: Refueling Area (El. 352'-0")

(a) Structural and architectural design features of fire area (see Figure B-10):

		Construction	Rating
Walls:	N -	Reinforced concrete (part adjacent to stairwell nos. 4 and 6)	2 hr
	N -	Reinforced concrete (part)	3 hr
	E -	Reinforced concrete (part	2 hr

	adjacent to stairwell nos. 5 and 6)	
	E - Reinforced concrete (part)	3 hr
	S - Reinforced concrete (part adjacent to stairwell nos. 3 and 5)	2 hr
	S - Reinforced concrete (part)	3 hr
	W - Reinforced concrete (part adjacent to stairwell nos. 3 and 4)	2 hr
	W - Reinforced concrete (part)	3 hr
Floor:	Reinforced concrete	3 hr*
Ceiling:	Reinforced concrete roof slab	3 hr*
Access:	Doors to stairwell nos. 3, 4, 5, and 6	1.5 hr
	Two doors to area 77	3 hr

(b) Major safety-related components in fire area:

(1) Reactor enclosure crane
(2) Refueling platforms for Units 1 and 2

(c) Postulated fire in area:

Since no combustible materials are located in this area, the origin of a postulated fire is indeterminate.

(d) Consequences of fire without active fire suppression:

(1) Loss of reactor enclosure crane
(2) Loss of refueling platforms for Units 1 and 2

(e) Consequences of fire with active fire suppression:

Upon receipt of notification in the control room that a fire has occurred in this area, the plant fire brigade will be dispatched to extinguish the fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with either of the two shutdown methods described in Section 5.2.2 is located in this fire area, both of these methods will remain available to safely shut the plant down.

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5.5 SAFE SHUTDOWN ANALYSIS - UNIT 2 REACTOR ENCLOSURE

This section will be submitted after the cable routing in the Unit 2 reactor enclosure has been substantially completed.

(Pages 5-119 through 5-170 are reserved for later use.)

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5.6 SAFE SHUTDOWN ANALYSIS - DIESEL-GENERATOR ENCLOSURES

5.6.1 Fire Area 79: Diesel-Generator Cell 1A (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N	- Reinforced concrete	3 hr
	E	- Reinforced concrete	3 hr
	S	- Reinforced concrete (exterior wall)	None
	W	- Reinforced concrete (exterior wall)	3 hr
Floor:		Reinforced concrete foundation	3 hr
Ceiling:		Reinforced concrete roof slab	3 hr*
Access:		Door at north side of cell	3 hr
		Door at south side of cell	None

(b) Major safety-related components in fire area:

(1) Diesel-generator 1A and auxiliaries
(2) ESW supply and return shutoff valves (HV-11-131A, HV-11-132A, HV-11-133A, and HV-11-134A)
(3) Diesel-generator air exhaust fans 1AV512 and 1EV512
(4) Diesel-generator control board 1AC514
(5) DC distribution panel 1AD501 (serving diesel-generator 1A and auxiliaries)
(6) Motor control center 10B515, which serves the following components:
 a. Auxiliaries of diesel-generator 1A
 b. ESW loop "A" discharge valve (HV-11-011A)

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Loss of diesel-generator 1A
(2) Loss of ESW loop "A"

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of the components discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.6.2 Fire Area 80: Diesel-Generator Cell 1C (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete (exterior wall)	None
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation	3 hr
Ceiling:	Reinforced concrete roof slab	3 hr*
Access:	Door at north side of cell	3 hr
	Door at south side of ceil	None

(b) Major safety-related components in fire area:

(1) Diesel-generator 1C and auxiliaries
(2) ESW supply and return shutoff valves (HV-11-131C, HV-11-132C, HV-11-133C, and HV-11-134C)
(3) Diesel-generator air exhaust fans 1CV512 and 1GV512
(4) Diesel-generator control board 1CC514
(5) DC distribution panel 1CD501 (serving diesel-generator 1C and auxiliaries)
(6) Motor control center 10B517, which serves auxiliaries of diesel-generator 1C

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

Loss of diesel-generator 1C.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of diesel-generator 1C operability may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.6.3 Fire Area 81: Diesel-Generator Cell 1B (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete (exterior wall)	None
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation	3 hr
Ceiling:	Reinforced concrete roof slab	3 hr*
Access:	Door at north side of cell	3 hr
	Door at south side of cell	None

(b) Major safety-related components in fire area:

(1) Dies l-generator 1B and auxiliaries

(2) ESW supply and return shutoff valves (HV-11-131B, HV-11-132B, HV-11-133B, and HV-11-134B)
(3) Diesel-generator air exhaust fans 1BV512 and 1FV512
(4) Diesel-generator control board 1BC514
(5) DC distribution panel 1BD501 (serving diesel-generator 1B and auxiliaries)
(6) Motor control center 10B516, which serves auxiliaries of diesel-generator 1B

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

Loss of diesel-generator 1B.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of diesel-generator 1B operability may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.6.4 Fire Area 82: Diesel-Generator Cell 1D (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N	- Reinforced concrete	3 hr
	E	- Reinforced concrete	3 hr
	S	- Reinforced concrete (exterior wall)	None
	W	- Reinforced concrete	3 hr
Floor:		Reinforced concrete foundation	3 hr
Ceiling:		Reinforced concrete roof slab	3 hr*
Access:		Door at north side of cell	3 hr
		Door at south side of cell	None

(b) Major safety-related components in fire area:

(1) Diesel-generator 1D and auxiliaries
(2) ESW supply and return shutoff valves (HV-11-131D, HV-11-132D, HV-11-133D, and HV-11-134D)
(3) Diesel-generator air exhaust fans 1DV512 and 1HV512
(4) Diesel-generator control board 1DC514
(5) DC distribution panel 1DD501 (serving diesel-generator 1D and auxiliaries)
(6) Motor control center 10B518, which serves the following components:
   a. Auxiliaries of diesel-generator 1D
   b. ESW loop "B" discharge valve (HV-11-015B)

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Loss of diesel-generator 1D
(2) Loss of ESW loop "B"

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of the components discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.6.5 Fire Area 83: Diesel-Generator Cell 2A (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete (exterior wall)	None
	W -	Reinforced concrete	3 hr
Floor:		Reinforced concrete foundation	3 hr
Ceiling:		Reinforced concrete roof slab	3 hr*
Access:		Door at north side of cell	3 hr
		Door at south side of cell	None

(b) Major safety-related components in fire area:

(1) Diesel-generator 2A and auxiliaries
(2) ESW supply and return shutoff valves (HV-11-231A, HV-11-232A, HV-11-233A, and HV-11-234A)
(3) Diesel-generator air exhaust fans 2AV512 and 2EV512
(4) Diesel-generator control board 2AC514
(5) DC distribution panel 2AD501 (serving diesel-generator 2A and auxiliaries)
(6) Motor control center 20B515, which serves auxiliaries of diesel-generator 2A

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Loss of diesel-generator 2A.

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of diesel-generator 2A operability may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.6.6 Fire Area 84: Diesel-Generator Cell 2C (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete	3 hr
	S - Reinforced concrete (exterior wall)	None
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation	3 hr
Ceiling:	Reinforced concrete roof slab	3 hr*
Access:	Door at north side of cell	3 hr
	Door at south side of cell	None

(b) Major safety-related components in fire area:

(1) Diesel-generator 2C and auxiliaries
(2) ESW supply and return shutoff valves (HV-11-231C, HV-11-232C, HV-11-233C, and HV-11-234C)
(3) Diesel-generator air exhaust fans 2CV512 and 2GV512
(4) Diesel-generator control board 2CC514
(5) DC distribution panel 2CD501 (serving diesel-generator 2C and auxiliaries)
(6) Motor control center 20B517, which serves the following components:

a. Auxiliaries of diesel-generator 2C
b. ESW loop "A" discharge valve (HV-11-015A)

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Loss of diesel-generator 2C
(2) Loss of ESW loop "A"

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of the components discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.6.7 Fire Area 85: Diesel-Generator Cell 2B (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N	- Reinforced concrete	3 hr
	E	- Reinforced concrete	3 hr
	S	- Reinforced concrete (exterior wall)	None
	W	- Reinforced concrete	3 hr
Floor:		Reinforced concrete foundation	3 hr
Ceiling:		Reinforced concrete roof slab	3 hr*
Access:		Door at north side of cell	3 hr
		Door at south side of cell	None

(b) Major safety-related components in fire area:

(1) Diesel-generator 2B and auxiliaries
(2) ESW supply and return shutoff valves (HV-11-231B, HV-11-232B, HV-11-233B, and HV-11-234B)
(3) Diesel-generator air exhaust fans 2BV512 and 2FV512
(4) Diesel-generator control board 2BC514
(5) DC distribution panel 2BD501 (serving diesel-generator 2B and auxiliaries)
(6) Motor control center 20B516, which serves the following components:
a. Auxiliaries of diesel-generator 2B
b. ESW loop "B" discharge valve (HV-11-011B)

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Loss of diesel-generator 2B
(2) Loss of ESW loop "B"

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of the components discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.6.8 Fire Area 86: Diesel-Generator Cell 2D (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

	Construction	Rating
Walls:	N - Reinforced concrete	3 hr
	E - Reinforced concrete (exterior wall)	3 hr
	S - Reinforced concrete (exterior wall)	None
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation	3 hr
Ceiling:	Reinforced concrete roof slab	3 hr*
Access:	Door at north side of cell	3 hr
	Door at south side of cell	None

(b) Major safety-related components in fire area:

(1) Diesel-generator 2D and auxiliaries
(2) ESW supply and return shutoff valves (HV-11-231D, HV-11-232D, HV-11-233D, and HV-11-234D)
(3) Diesel-generator air exhaust fans 2DV512 and 2HV512
(4) Diesel-generator control board 2DC514
(5) DC distribution panel 2DD501 (serving diesel-generator 2D and auxiliaries)
(6) Motor control center 20B518, which serves auxiliaries of diesel-generator 2D

(c) Postulated fire in area:

Leakage of fuel oil or lubricating oil from the diesel engine onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

Loss of diesel-generator 2D

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire will activate the smoke detectors in this area, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, complete loss of diesel-generator 2D operability may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

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5.7 SAFE SHUTDOWN ANALYSIS - SPRAY POND PUMP STRUCTURE

5.7.1 Fire Area 122: Spray Pond Pump Structure, Western Half

(a) Structural and architectural design features of fire area (see Figures B-11 and B-12):

		Construction	Rating
Walls:	N	- Reinforced concrete (exterior wall)	None
	E	- Reinforced concrete	3 hr
	S	- Reinforced concrete (exterior wall)	None
	W	- Reinforced concrete (exterior wall)	3 hr
Floor:		Reinforced concrete foundation	3 hr
Ceiling:		Reinforced concrete roof slab	3 hr*
Access:		Door connecting to area 123	3 hr
		Door connecting to outside	None
		Roolup door connecting to outside	None

(b) Major safety-related components in fire area:

(1) ESW pumps OAP548 and OCP548
(2) RHRSW pumps OAP506 and OCP506
(3) Sluice gates HV-12-003A&C
(4) RHRSW valves:
    HV-12-031A&C (winter bypass line)
    HV-12-032A&C (spray networks A and C)
    HV-12-034A (spray network cross-connection)
    HV-12-112 and HV-12-114 (inlet from the Unit 1 cooling tower)
(5) Spray pond pump structure supply fans OAV543 and OCV543
(6) Motor control centers OOB519 (Div. 1) and OOB521 (Div. 3), which serve the following components:
    a. ESW loop "A" valves
    b. RHRSW loop "A" valves
    c. Spray pond pump structure supply fan OAV543 and associated heaters and dampers
    d. Spray pond pump structure supply fan OCV543 and associated heaters and dampers

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

(1) Loss of ESW loop "A"
(2) Loss of RHRSW loop "A"
(3) Loss of all ventilation for western half of spray pond pump structure

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method B (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

5.7.2 Fire Area 123: Spray Pond Pump Structure, Eastern Half

(a) Structural and architectural design features of fire area (see Figures B-11 and B-12):

	Construction	Rating
Walls:	N - Reinforced concrete (exterior wall)	None
	E - Reinforced concrete (exterior wall)	3 hr
	S - Reinforced concrete (exterior wall)	None
	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation	None
Ceiling:	Reinforced concrete roof slab	3 hr*
Access:	Door connecting to area 122	3 hr
	Door connecting to outside	None
	Roolup door connecting to outside	None

(b) Major safety-related components in fire area:

(1) ESW pumps OBP548 and ODP548
(2) RHRSW pumps OBP506 and ODP506
(3) Sluice gates HV-12-003B&D
(4) RHRSW valves:
HV-12-031B&D (winter bypass line)
HV-12-032B&D (spray networks B and D)
HV-12- (spray network cross-connection)
HV-12-212 and HV-12-214 (inlet from the Unit 2 cooling tower)
(5) Spray pond pump structure supply fans OBV543 and ODV543
(6) Motor control centers OOB520 (Div. 2) and OOB522 (Div. 4), which serve the following components:
a. ESW loop "B" valves
b. RHRSW loop "B" valves
c. Spray pond pump structure supply fan OBV543 and associated heaters and dampers
d. Spray pond pump structure supply fan ODV543 and associated heaters and dampers

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

(1) Loss of ESW loop "B"
(2) Loss of RHRSW loop "B"
(3) Loss of all ventilation for eastern half of spray pond pump structure

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. Depending on the severity and rate of spread of the fire, loss of all the functions discussed in (d) above may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown method A (as described in Section 5.2.2) is located in this fire area, this method will remain available to safely shut the plant down.

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5.8 SAFE SHUTDOWN ANALYSIS - TURBINE ENCLOSURE

5.8.1 Fire Area 87: Condensate Pump Room (El. 189'-0")

(a) Structural and architectural design features of fire area (see Figures B-5 and B-6):

		Construction	Rating
Walls:	N -	Reinforced concrete	3 hr
	E -	Reinforced concrete (below elev. 217 feet)	3 hr
	E -	Concrete masonry unit (above elev. 217 feet)	2 hr
	S -	Reinforced concrete	3 hr
	W -	Reinforced concrete	3 hr
Floor:		Reinforced concrete foundation mat	3 hr
Ceiling:		Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:		Watertight door connecting to area 88	3 hr
		Two doors connecting to area 113	1.5 hr
		Removable metal panels connecting to area 113	2 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.2 Fire Area 88: Main Condenser Area and Feedwater Heater Rooms (El. 200'-0" and 239'-0")

(a) Structural and architectural design features of fire area (see Figures B-5, B-6, and B-7):

			Construction	Rating
Walls:	N	-	Reinforced concrete and concrete masonry unit (below elev. 217 feet)	3 hr
	N	-	Reinforced concrete and precast concrete panels (exterior wall, above elev. 217 feet)	None
	E	-	Reinforced concrete (below elev. 217 feet; contains 25 ft^2 of unrated steel plate as separation from area 115)	3 hr
	E	-	Reinforced concrete and concrete masonry unit (above elev. 217 feet)	3 hr
	S	-	Reinforced concrete and concrete masonry unit (below elev. 217 feet)	3 hr
	S	-	Reinforced concrete (between elev. 217 and 239 feet)	3 hr
	S	-	Reinforced concrete (above elev. 239 feet, contains 188 ft^2 of unrated metal blowout panels)	3 hr
	W	-	Reinforced concrete (portion north of column line N)	3 hr
	W	-	Concrete masonry unit (exterior wall above elev. 239 feet)	None

Floor:	Reinforced concrete foundation mat (elev. 200 feet)	3 hr
	Reinforced concrete (elev. 239 feet; supported by structural steel members without fireproofing)	None
Ceiling:	Reinforced concrete	None
Access:	Watertight doors connecting to areas 87 and 94	3 hr
	Three doors connecting to area 89	3 hr
	Five doors connecting to area 97	3 hr
	Doors connecting to areas 95 and 113	3 hr

(b) Major safety-related components in fire area:

(1) Main turbine stop valve position switches (ZS-01-104A,B,C&D)
(2) Turbine control valve fast closure pressure switches (PS-01-102A,B,C&D)
(3) Main steam line area temperature detectors

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

(1) Possible reactor trip
(2) MSIV closure, with resultant reactor trip

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. If the fire is in the main condenser area and the compartment temperature rises to 212°F, individual sprinkler heads in the wet pipe sprinkler system will open to control and/or extinguish the fire. Depending on the severity and rate of spread of the fire, MSIV closure and reactor trip may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.3 Fire Area 89: Reactor Feedwater Pump Lube Oil Areas, Control Rod Drive Water Pump Area, and Condensate Filter/Demineralizer Compartments (El. 200'-0")

(a) Structural and architectural design features of fire area (see Figures B-5 and B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete and concrete masonry unit	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat (contains 76 ft^2 grating opening connecting to area 115)			3 hr
Ceiling:	Reinforced concrete (contains 156 ft^2 grating opening connecting to area 94)			None
Access:	Three doors connecting to area 88			3 hr
	Door connecting to area 1			3 hr
	Door connecting to stairwell no. 30			1.5 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Leakage of lube oil from the reactor feedwater pump lube oil reservoirs onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

The heat generated by a fire in this area will activate the heat detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 212°F, individual fusible link sprinkler heads in the wet pipe sprinkler systems will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.4 Fire Area 90: Air Ejector and Steam Packing Exhauster Compartment (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete concrete masonry unit	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete and concrete masonry unit	3 hr
Floor:	Reinforced concrete foundation mat			3 hr
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Access:	Door connecting to area 113			3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.5 Fire Area 91: Air Ejector and Steam Packing Exhauster Compartment (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete and concrete masonry unit	3 hr
	S	-	Reinforced concrete and concrete masonry unit	3 hr
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Access:	Door connecting to area 113			3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.6 Fire area 92: Mechanical Vacuum Pump Room (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N -	Concrete masonry unit	3 hr
	E -	Reinforced concrete	3 hr
	S -	Concrete masonry unit	3 hr
	W -	Reinforced concrete and concrete masonry unit	3 hr
Floor:		Reinforced concrete (supported by structural steel members without fireproofing)	None
Ceiling:		Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:		Door connecting to area 94	3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.7 Fire Area 93: Air Compressor Area, EHC Power Unit Area, and Turbine Lube Oil Storage Tank Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Precast concrete panels (exterior wall)	None
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Precast concrete panels (exterior wall)	None
Floor:	Reinfoced concrete foundation mat			3 hr
Ceiling:	Reinforced concrete (contains equipment hatch with 55 ft^2 of steel plate and a 96 ft^2 opening partially filled with grating)			None
Access:	Door connecting to area 94			3 hr

Door connecting to stairwell no. 32	1.5 hr
Rollup door to outside	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Leakage of lube oil from the turbine lube oil storage tanks onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

The heat generated by a fire in this area will activate the heat detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 212°F, individual fusible link sprinkler heads in the wet pipe sprinkler system will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.8 Fire Area 94: Reactor Feedwater Pump Turbine Compartments and Reactor Feedwater Pump Access Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete and concrete masonry unit	3 hr
	S	-	Reinforced concrete	3 hr

		(part)	
S	-	Reinforced concrete and concrete masonry unit (part adjacent to area 89; contains 8 HVAC duct penetrations without fire dampers)	None
S	-	Precast concrete panels (part, exterior wall)	None
W	-	Precast concrete panels (exterior wall)	None

Floor:	Reinforced concrete (contains 156 ft² grating opening connecting to area 89)	None
Ceiling:	Reinforced concrete (contains equipment hatch with 66 ft² of steel plate)	None
Access:	Doors connecting to areas 92, 93, and 120	3 hr
	Steamtight door connecting to area 2	3hr**
	Watertight door connecting to area 88	3 hr
	Door connecting to stairwell no. 30	1.5 hr
	Rollup door to outside	None
	Open stairwell leading up to area 95	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.9 Fire Area 95: MCC Room, TECW Equipment Area, and Turbine Lube Oil Reservoir and Centrifuge Area (El. 239'-0")

(a) Structural and architecutral design features of fire area (see Figure B-7):

			Construction	Rating
Walls:	N	-	Precast concrete panels (exterior wall)	None
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Precast concrete panels (exterior wall)	None
Floor:	Reinforced concrete (contains equipment hatch with 55 ft^2 of steel plate and a 96 ft^2 opening partially filled with grating)			None
Ceiling:	Reinforced concrete (contains equipment hatch with 78 ft^2 of steel plate)			None
Access:	Doors connecting to areas 88 and 96			3 hr
	Door connecting to stairwell no. 32			1.5 hr
	Open stairwell leading down to area 94			None

(b) Major safety-related components in fire area:

(1) Main turbine first stage pressure transmitters (PT-01-1N052A,B,C&D)

(2) Main steam line pressure transmitters (PT-01-1N076A,B,C&D)

(c) Postulated fire in area:

Leakage of lube oil from the turbine lube oil reservoir onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Possible reactor trip
(2) Possible MSIV closure, with resultant reactor trip

(e) Consequences of fire with active fire suppression:

The heat generated by a fire in this area will activate the heat detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 212°F, individual fusible link sprinkler heads in the wet pipe sprinkler system will open to control and/or extinguish the fire. In addition, a compartment temperature of 212°F will cause actuation of the deluge systems located over the turbine lube oil reservoir and the turbine lube oil centrifuge. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, reactor trip and MSIV closure may be avoided.

(f) Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.10 Fire Area 96: Battery Room (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

			Construction	Rating
Walls:	N	-	Concrete masonry unit	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Concrete masonry unit	3 hr
	W	-	Concrete masonry unit	3 hr
Floor:	Reinforced concrete (supported by structural steel members without fireproofing)			None

Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:	Door connecting to area 95	3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

The smoke and heat generated by a fire in this area will activate the smoke and heat detectors which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.11 Fire Area 97: Equipment Hatch Corridor (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete (part)	3 hr
	S	-	Precast concrete panels (part, exterior wall)	None
	W	-	Precast concrete panels (exterior wall)	None

Floor:	Reinforced concrete (contains equipment hatch with 66 ft^2 of steel plate)	None
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:	Five doors connecting to area 88	3 hr
	Steamtight door connecting to area 7	3 hr**
	Door connecting to stairwell no. 30	1.5 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.12 Fire Area 98: Reactor Recirculation Pump M-G Set Area and Feedwater Heater Rooms (El. 269'-0")

(a) Structural and architectural design features of fire area (see Figure B-8):

			Construction	Rating
Walls:	N	-	Concrete masonry unit	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete (part)	3 hr
	S	-	Precast concrete panels (part, exterior wall)	None
	W	-	Precast concrete panels (exterior wall)	None
Floor:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Ceiling:	Reinforced concrete (contains two equipment hatches covered with steel plate, one of 75 ft^2 and one of 110 ft^2)			None
Access:	Door connecting to stairwell no. 30			1.5 hr
	Door connecting to area 45			3 hr
	Two doors connecting to area 114			3 hr
	Two rollup doors connecting to area 114			3 hr

(b) Major safety-related components in fire area:

(1) Junction boxes containing cables associated with the following components:
  a. Main turbine stop valve position switches (ZS-01-104A,B,C&D)
  b. Turbine control valve fast closure pressure switches (PS-01-102A,B,C&D)

(c) Postulated fire in area:

Leakage of lube oil from the recirculation pump M-G sets onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Possible reactor trip

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the fire is in the area of the recirculation pump M-G sets, the pre-action sprinkler system will provide automatic suppression of the fire. A rise in compartment temperature to 190°F will cause the deluge valve to open and prime the pre-action sprinkler system with water. At 212°F, individual fusible link sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, reactor trip may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.13 Fire Area 99: Turbine Enclosure HVAC Area and Equipment Compartment Exhaust Filter Area (El. 302'-0")

(a) Structural and architectural design features of fire area (see Figure B-9):

			Construction	Rating
Walls:	N	-	Concrete masonry unit	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete (part)	3 hr
	S	-	Precast concrete panels (part, exterior wall)	None
	W	-	Precast concrete panels (exterior wall)	None
Floor:	Reinforced concrete (contains two equipment hatches covered with steel plate, one of 75 ft² and one of 110 ft²)			None
Ceiling:	Metal deck, non-reinforced concrete, and built-up roofing			UL Class A
Access:	Door connecting to stairwell no. 30			1 5. hr

Two steamtight doors connecting to area 27	3 hr**

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of charcoal filters.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

In the event of a fire in one of the turbine enclosure equipment compartment exhaust filters, a heat detector inside the filter plenum will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. The fire brigade will utilize a manual valve in the fire protection water supply system to initiate operation of a water spray system inside the filter plenum. No effect on safety-related systems will result from a fire in this area.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.14 Fire Area 100: Condensate Pump Room (El. 189'-0")

(a) Structural and architectural design features of fire area (see Figures B-5 and B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete (below elev. 217 feet)	3 hr
	W	-	Reinforced concrete (above elev. 217 feet)	2 hr

Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:	Watertight door connecting to area 101	3 hr
	Two doors connecting to area 113	1.5 hr
	Removable metal panels connecting to area 113	2 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.15 Fire Area 101: Main Condenser Area and Feedwater Heater Rooms (El. 200'-0" and 239'-0")

(a) Structural and architectural design features of fire area (see Figures B-5, B-6, and B-7):

		Construction	Rating
Walls:	N -	Reinforced concrete and concrete masonry unit (below elev. 217 feet)	3 hr
	N -	Reinforced concrete and precast concrete panels (exterior wall, above elev. 217 feet)	None
	E -	Reinforced concrete (portion north of column line N)	3 hr
	E -	Concrete masonry unit (exterior wall above elev. 239 feet)	None
	S -	Reinforced concrete and concrete masonry unit (below elev. 217 feet)	3 hr
	S -	Reinforced concrete (between elev. 217 and 239 feet)	3 hr
	S -	Reinforced concrete (above elev. 239 feet; contains 188 ft^2 of unrated metal blowout panels)	3 hr
	W -	Reinforced concrete (below elev. 217 feet; contains 25 ft^2 of unrated steel plate as separation from area 115)	3 hr
	W -	Reinforced concrete and concrete masonry unit (above elev. 217 feet)	3 hr
Floor:	Reinforced concrete foundation mat (elev. 200 feet)		3 hr
	Reinforced concrete (elev. 239 feet; supported by structural steel members without fireproofing)		None
Ceiling:	Reinforced concrete		None
Access:	Watertight doors connecting to areas 100 and 107		3 hr
	Three doors connecting to		3 hr

area 102	
Five doors connecting to area 110	3 hr
Doors connecting to areas 108 and 113	3 hr

(b) Major safety-related components in fire area:

(1) Main turbine stop valve position switches (ZS-01-204A,B,C&D)
(2) Turbine control valve fast closure pressure switches (PS-01-202A,B,C&D)
(3) Main steam line area temperature detectors

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

(1) Possible reactor trip
(2) MSIV closure, with resultant reactor trip

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. If the fire is in the main condenser area and the compartment temperature rises to 212°F, individual sprinkler heads in the wet pipe sprinkler system will open to control and/or extinguish the fire. Depending on the severity and rate of spread of the fire, MSIV closure and reactor trip may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.16 Fire Area 102: Reactor Feedwater Pump Lube Oil Areas, Control Rod Drive Water Pump Area, and Condensate Filter/Demineralizer Compartments (El. 200'-0")

(a) Structural and architectural design features of fire area (see Figures B-5 and B-6):

		Construction	Rating
Walls:	N -	Reinforced concrete and concrete masonry unit	3 hr
	E -	Reinforced concrete	3 hr
	S -	Reinforced concrete	3 hr
	W -	Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat		3 hr
Ceiling:	Reinforced concrete (contains 156 ft^2 grating opening connecting to area 107)		None
Access:	Three doors connecting to area 101		3 hr
	Two doors connecting to area 1		3 hr
	Door connecting to stairwell no. 31		1.5 hr
	Door connecting to area 115		None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area;

Leakage of lube oil from the reactor feedwater pump lube oil reservoirs onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

The heat generated by a fire in this area will activate the heat detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 212°F, individual fusible link sprinkler heads in the wet pipe sprinkler systems will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.17 Fire Area 103: Air Ejector and Steam Packing Exhauster Compartment (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete and concretre masonry unit	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete and concrete masonry unit	3 hr
Floor:	Reinforced concrete foundation mat			3 hr
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Access:	Door connecting to area 113			3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.18 Fire Area 104: Air Ejector and Steam Packing Exhauster Compartment (El. 217'-0")

(a) Structure and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete and concrete masonry unit	3 hr
	W	-	Reinforced concrete and concrete masonry unit	3 hr
Floor:	Reinforced concrete (supported by structural steel members without fireproofing)			
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Access:	Door connecting to area 113			3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.19 Fire Area 105: Mechanical Vacuum Pump Room (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

		Construction	Rating
Walls:	N -	Concrete masonry unit	3 hr
	E -	Reinforced concrete and concrete masonry unit	3 hr
	S -	Concrete masonry unit	3 hr
	W -	Reinforced concrete	3 hr
Floor:		Reinforced concrete (supported by structural steel members without fireproofing)	None
Ceiling:		Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:		Door connecting to area 107	3 hr

(b) Major safety-related components in fire area;

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.20 Fire Area 106: Air Compressor Area, EHC Power Unit Area, and Turbine Lube Oil Storage Tank Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Precast concrete panels (exterior wall)	None
	E	-	Precast concrete panels (exterior wall)	None
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat			3 hr
Ceiling:	Reinforced concrete (contains equipment hatch with 55 ft^2 of steel plate and a 96 ft^2 opening partially filled with grating)			None
Access:	Door connecting to area 107			3 hr
	Door connecting to stairwell no. 33			1.5 hr
	Rollup door to outside			None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Leakage of lube oil from the turbine lube oil storage tanks onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

The heat generated by a fire in this area will activate the heat detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 212°F, individual fusible link sprinkler heads in the wet pipe sprinkler system will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.21 Fire Area 107: Reactor Feedwater Pump Turbine Compartments and Reactor Feedwater Pump Access Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Precast concrete panels (exterior wall)	None
	S	-	Reinforced concrete (part)	3 hr
	S	-	Reinforced concrete and concrete masonry unit (part adjacent to area 102; contains 8 HVAC duct penetrations without fire dampers)	None
	W	-	Reinforced concrete and concrete masonry	3 hr

unit

Floor:	Reinforced concrete (contains 156 ft^2 grating opening connecting to area 102)	None
Ceiling:	Reinforced concrete (contains equipment hatch with 66 ft^2 of steel plate)	None
Access:	Doors connecting to areas 105, 106, and an entryway to the Unit 2 reactor enclosure	3 hr
	Two doors connecting to the administration complex	3 hr
	Steamtight door connecting to area 2	3 hr**
	Watertight door connecting to area 101	3 hr
	Door connecting to stairwell no. 31	1.5 hr
	Rollup door to outside	None
	Open stairwell leading to area 108	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.22 Fire Area 108: MCC Room, TECW Equipment Area, and Turbine Lube Oil Reservoir and Centrifuge Area (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

			Construction	Rating
Walls:	N	-	Precast concrete panels (exterior wall)	None
	E	-	Precast concrete panels (exterior wall)	None
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete (contains equipment hatch with 55 ft^2 of steel plate and a 96 ft^2 opening partially filled with grating)			None
Ceiling:	Reinforced concrete (contains equipment hatch with 78 ft^2 of steel plate)			None
Access:	Doors connecting to areas 101 and 109			3 hr
	Door connecting to stairwell no. 33			1.5 hr
	Open stairwell leading down to area 107			None

(b) Major safety-related components in fire area:

(1) Main turbine first stage pressure transmitters (PT-01-2N052A,B,C&D)
(2) Main steam line pressure transmitters (PT-01-2N076A,B,C&D)

(c) Postulated fire in area:

Leakage of lube oil from the turbine lube oil reservoir onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Possible reactor trip
(2) Possible MSIV closure, with resultant reactor trip

(e) Consequences of fire with active fire suppression:

The heat generated by a fire in this area will activate the heat detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the compartment temperature rises to 212°F, individual fusible link sprinkler heads in the wet pipe sprinkler system will open to control and/or extinguish the fire. In addition, a compartment temperature of 212°F will cause actuation of the deluge systems located over the turbine lube oil reservoir and the turbine lube oil centrifuge. The plant fire brigade will be dispatched to ensure that the fire is extinguished. Depending on the severity and rate of spread of the fire, reactor trip and MSIV closure may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.23 Fire Area 109: Battery Room (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

			Construction	Rating
Walls:	N	-	Concrete masonry unit	3 hr
	E	-	Concrete masonry unit	3 hr
	S	-	Concrete masonry unit	3 hr
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Access:	Door connecting to area 108			3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of battery cases caused by an exposure fire.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

The smoke and heat generated by a fire in this area will activate the smoke and heat detectors which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.24 Fire Area 110: Equipment Hatch Corridor (El. 239'-0")

(a) Structural and architectural design features of fire area (see Figure B-7):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Precast concrete panels (exterior wall)	None
	S	-	Reinforced concrete (part)	3 hr
	S	-	Precast concrete panels (part, exterior wall)	None
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete (contains equipment hatch with 66 ft^2 of steel plate)			None
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None

Access:	Five doors connecting to area 101	3 hr
	Steamtight door connecting to area 7	3 hr**
	Door connecting to stairwell no. 30	1.5 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression;

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.25 Fire Area 111: Reactor Recirculation Pump M-G Set Area and Feedwater Heater Rooms (El. 269'-0")

(a) Structural and architectural design features of fire area (see Figure B-8):

			Construction	Rating
Walls:	N	-	Concrete masonry unit	3 hr
	E	-	Precast concrete panels (exterior wall)	None
	S	-	Reinforced concrete (part)	3 hr
	S	-	Precast concrete panels (part, exterior wall)	None

	W - Reinforced concrete	3 hr
Floor:	Reinforced concrete (supported by structural steel members without fireproofing)	None
Ceiling:	Reinforced concrete (contains two equipment hatches covered with steel plate, one of 75 ft^2 and one of 110 ft^2)	None
Access:	Door connecting to stairwell no. 31	1.5 hr
	Door connecting to administration complex	3 hr
	Two doors connecting to area 114	3 hr
	Two rollup doors connecting to area 114	3 hr

(b) Major safety-related components in fire area:

(1) Junction boxes containing cables associated with the following components:
a. Main turbine stop valve position switches (ZS-01-204A,B,C&D)
b. Turbine control valve fast closure pressure switches (PS-01-202A,B,C&D)

(c) Postulated fire in area:

Leakage of lube oil from the recirculation pump M-G sets onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

(1) Possible reactor trip

(e) Consequences of fire with active fire suppression:

The smoke generated by a fire in this area will activate the smoke detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. If the fire is in the area of the recirculation pump M-G sets, the pre-action sprinkler system will provide automatic suppression of the fire. A rise in compartment temperature to 190°F will cause the deluge valve to open and prime the pre-action sprinkler system with water. At 212°F, individual fusible link sprinkler heads will open to control and/or extinguish the fire. The plant fire brigade will be dispatched to ensure that the fire is extinguished.

Depending on the severity and rate of spread of the fire, reactor trip may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.26 Fire Area 112: Turbine Enclosure HVAC Area and Equipment Compartment Exhaust Filter Area (El. 302'-0")

(a) Structural and architectural design features of fire area (see Figure B-9):

			Construction	Rating
Walls:	N	-	Concrete masonry unit	3 hr
	E	-	Precast concrete panels (exterior wall)	None
	S	-	Reinforced concrete (part)	3 hr
	S	-	Precast concrete panels (part, exterior wall)	None
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete (contains two equipment hatches covered with steel plate, one of 75 ft^2 and one of 110 ft^2)			None
Ceiling:	Metal deck, non-reinforced concrete, and built-up roofing			UL Class A
Access:	Door connecting to stairwell no. 31			1.5 hr
	Steamtight door connecting to area 27			3 hr**

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of charcoal filters.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

In the event of a fire in one of the turbine enclosure equipment compartment exhaust filters, a heat detector inside the filter plenum will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. The fire brigade will utilize a manual valve in the fire protection water supply system to initiate operation of a water spray system inside the filter plenum. No effect on safety-related systems will result from a fire in this area.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.27 Fire Area 113: Railroad Access Area and Generator Equipment Area (El. 217'-0" and 239'-0")

(a) Structural and architectural design features of fire area (see Figures B-6 and B-7):

			Construction	Rating
Walls:	N	-	Reinforced concrete and concrete masonry unit (exterior wall)	None
	E	-	Reinforced concrete and concrete masonry unit (part)	3 hr
	E	-	Concrete masonry unit (part adjacent to area 100)	2 hr
	S	-	Reinforced concrete and concrete masonry unit	3 hr
	W	-	Reinforced concrete and concrete masonry unit (part)	3 hr
	W	-	Concrete masonry unit (part adjacent to area 87)	2 hr
Floor:	Reinforced concrete foundation mat			3 hr

Ceiling:	Reinforced concrete (contains a 1960 ft^2 hatchway partially filled with grating)	None
Access:	Two doors connection to area 87 and two doors connecting to area 100	1.5 hr
	Removable metal panels connecting to areas 87 and 100	2 hr
	Door connecting to areas 88, 90, 91, 101, 103, and 104	3 hr
	Steamtight doors connecting to to areas 2, 8, 10, 12, 14, 16, 18, and stairwell no. 7	3 hr**

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Leakage of seal oil from the generator hydrogen seal oil units onto the floor of the compartment, with subsequent ignition of the oil.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

A rise in compartment temperature to 140°F will cause the deluge valve to open and prime the pre-action sprinkler system with water. At 165°F, individual sprinkler heads will open to control and/or extinguish the fire. In addition, a compartment temperature of 212°F will cause actuation of the deluge systems located over the generator hydrogen seal oil units. The plant fire brigade will be dispatched to ensure that the fire is extinguished. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.8.28 Fire Area 114: Turbine Operating Floor (El. 269'-0")

(a) Structural and architectural design features of fire area (see Figures 7-8 and 7-9):

		Construction	Rating
Walls:	N -	Precast concrete panels (exterior wall)	None
	E -	Precast concrete panels (exterior wall)	None
	S -	Reinforced concrete and concrete masonry unit	3 hr
	W -	Precast concrete panels (exterior wall)	None
Floor:		Reinforced concrete (contains a 1960 ft² hatchway partially filled with grating, plus 14 equipment hatches covered with steel plate)	None
Ceiling:		Metal deck, non-reinforced concrete, and built-up roofing	UL Class A
Access:		Doors connecting to stairwell nos. 32 and 33	1.5 hr
		Two doors connecting to area 98 and two doors connecting to area 111	3 hr
		Two rollup doors connecting to area 98 and two rollup doors connecting to area 111	3 hr
		Two steamtight doors connecting to area 24 and one steamtight door connecting to stairwell no. 7	3 hr**

(b) Major safety-related components located in fire area:

(1) Main condenser pressure transmitters (PT-01-1N075A,B,C&D)

(2) Junction boxes containing cables associated with the following components:

a. Main turbine first stage pressure transmitters (PT-01-1N052A,B,C&D)

b. Main steam line pressure transmitters (PT-01-1N076A,B,C&D)

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

(1) Possible reactor trip
(2) Possible MSIV closure, with resultant reactor trip

(e) Consequences of fire with active fire suppression:

The smoke and heat generated by a fire in this area will activate the early warning smoke and heat detectors, which will cause an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. If the fire occurs under the turbine's appearance lagging, the pre-action sprinkler system will provide automatic suppression of the fire. At 190°F, the deluge valve will open and prime the pre-action sprinkler system with water. At 212°F, individual sprinkler heads will open to control and/or extinguish the fire. Depending on the severity and rate of spread of the fire, reactor trip and MSIV closure may be avoided.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

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5.9 SAFE SHUTDOWN ANALYSIS - RADWASTE ENCLOSURE

5.9.1 Fire Area 115: Radwaste Pipe Tunnel (El. 183'-0", 187'-0", 191'-0", and 200'-0")

(a) Structural and architectural design features of fire area (see Figures B-4 and B-5):

	Construction	Rating
Walls:	East wall at column line 27.4 between columns J and Ka - Concrete masonry unit (contains piping penetrations without 3-hour rated seals)	None
	West wall near column line 18, approx. 19 feet north of column line N, between elev. 200 and 205 feet - Steel plate (25 ft²)	None
	East wall near column line 28, approx. 19 feet north of column line N, between elev. 200 and 205 feet - Steel plate (25 ft²)	None
	North wall at 7.5 feet north of column line J, between columns 19.4 and 23, and between elev. 200 and 217 feet - Concrete masonry unit (contains 2 HVAC duct penetrations without fire dampers)	None
	All other walls - Reinforced concrete and concrete masonry unit	3 hr
Floor:	Below zone 115D between column lines 19.4 and 26.6 - Reinforced concrete (supported by structural steel members without fireproofing)	None
	Below all other portions of the fire area - Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (contains 76 ft² grating opening connecting to area 89)	None

Access:	Door connecting to area 102	None
	Door connecting to area 118	3 hr

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Since no combustible materials are located in this area, the origin of a postulated fire is indeterminate.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.9.2 Fire Area 116: Miscellaneous Radwaste Equipment Areas (El. 162'-0")

(a) Structural and architectural design features of fire area (see Figure B-4):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete	3 hr
Floor:			Reinforced concrete foundation mat	3 hr
Ceiling:			Reinforced concrete (contains equipment hatch filled with 49 ft^2 of steel plate)	None
Access:			Doors connecting to stairwell	1.5 hr

nos. 1 and 2

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

(1) Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)
(2) Ignition of charcoal filters.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. In the event of a fire in the waste tank vent exhaust filter, a heat detector inside the filter plenum will cause an audible-visual annunciation to register on the fire protection panels in the control. The fire brigade will utilize a manual valve in the fire protection water supply system to initiate operation of a water spray system inside the filter plenum. No effect on safety-related systems will result from a fire in this area.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.9.3 Fire Area 117: Offgas Pipe Tunnel (El. 186'-0" and 187'-6")

(a) Structural and architectural design features of fire area (see Figure B-4):

	Construction	Rating
Walls:	West wall adjoining fire area 119 - Reinforced concrete (contains piping penetrations without fire rated seals)	None
	North wall adjoining fire area 119, at 3 feet north of column line H - Reinforced concrete and concrete masonry unit (contains piping penetrations without fire rated seals)	None
	All other walls - Reinforced concrete	3 hr
Floor:	Reinforced concrete foundation mat	3 hr
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:	Concrete hatch plugs	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Since no combustible materials are located in this area, the origin of a postulated fire is indeterminate.

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.9.4 Fire Area 118: Miscellaneous Radwaste Equipment Areas (El. 191'-0")

(a) Structural and architectural design features of fire area (see Figure B-5):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete (part)	3 hr
	W	-	Reinforced concrete (part adjacent to area 119; contains piping and electrical penetrations without fire-rated seals and HVAC duct penetrations without fire dampers)	None
Floor:	Reinforced concrete (contains equipment hatch filled with 49 ft^2 of steel plate)			None
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Access:	Door connecting to area 115			3 hr
	Doors connecting to stairwell nos. 1 and 2			1.5 hr
	Door connecting to area 119			None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.9.5 Fire Area 119: Offgas Equipment Areas (El. 195'-0")

(a) Structural and architectural design features of fire area (see Figure B-5):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete (contains piping and electrical penetrations without fire-rated seals and HVAC duct penetrations without fire dampers)	None
	S	-	Reinforced concrete	3 hr
	W	-	Reinforced concrete	3 hr
Floor:	Reinforced concrete (supported in some areas by structural steel members without fire-proofing)			None
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Access:	Door connecting to stairwell no. 1			1.5 hr
	Door connecting to area 118			None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

Upon receiving notification that a fire has occurred in this area, the operator will dispatch the plant fire brigade to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.9.6 Fire Area 120: Radwaste Control Room, Laboratories, Laundry, Decontamination and Change Areas, Waste Drum Storage Room, and Cask Loading Area (El. 217'-0")

(a) Structural and architectural design features of fire area (see Figure B-6):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete (part, exterior wall)	None
	S	-	Reinforced concrete (part adjacent to stairwell no. 1)	2 hr
	W	-	Reinforced concrete (contains piping penetrations without fire-rated seals)	None
Floor:	Reinforced concrete (supported by structural steel members without fireproofing)			None
Ceiling:	Reinforced concrete (supported by structural steel members without fireproofing)			None

Access:	Doors connecting to area 94 and stairwell no. 4	3 hr
	Doors connecting to stairwell nos. 2 and 3	1.5 hr
	Two doors to outside	None
	Rollup door to outside	None
	Open stairwell leading up to area 121	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

If a fire occurs in the fire zones which are provided with smoke or heat detectors, the smoke and heat generated by the fire will activate the detectors, causing an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. If a fire occurs in the waste drum storage room and the temperature in that area rises to 212°F, individual fusible link sprinkler heads in the wet pipe sprinkler system will open to control and/or extinguish the fire. Again, the plant fire brigade will be dispatched to ensure that the fire is extinguished. No effect on safety-related systems will result from a fire in this area.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

5.9.7 Fire Area 121: Centrifuge Rooms, Solid Radwaste Equipment Rooms, Ventilation Filter Compartments, and Supply and Exhaust Fan Areas (El. 237'-0" and 257'-0")

(a) Structural and architectural design features of fire area (see Figures B-7 and B-8):

			Construction	Rating
Walls:	N	-	Reinforced concrete	3 hr
	E	-	Reinforced concrete	3 hr
	S	-	Reinforced concrete (part, exterior wall)	3 hr
	S	-	Reinforced concrete (part adjacent to area 120 between elev. 237 and 257 feet; contains piping and electrical penetrations without fire-rated seals)	None
	W	-	Reinforced concrete (part adjacent to area 120 between elev. 237 and 257 feet; contains piping penetrations without fire-rated seals)	None
	W	-	Reinforced concrete (part, exterior wall above elev. 257 feet containing louvered openings)	None
	W	-	Reinforced concrete (part)	3 hr
Floor:			Reinforced concrete (supported by structural steel members without fireproofing)	None
Ceiling:			Reinforced concrete (supported by structural steel members without fireproofing)	None
Access:			Door connecting to stairwell no. 2	1.5 hr
			Two doors connecting to stairwell no. 3	1.5 hr
			Open stairwell leading down to area 120	None

(b) Major safety-related components in fire area:

None

(c) Postulated fire in area:

Ignition of electrical cabling in cable tray. (As discussed in Table A-3, the ignition of electrical cabling is extremely unlikely in the absence of a fire source external to the cabling.)

(d) Consequences of fire without active fire suppression:

No effect on safety-related systems.

(e) Consequences of fire with active fire suppression:

If a fire occurs in the fire zones which are provided with smoke detectors, the smoke generated by the fire will activate the detectors, causing an audible-visual annunciation to register on the fire protection panels in the control room. Once the alarm has been received in the control room, the plant fire brigade will be dispatched to extinguish the fire. No effect on safety-related systems will result from such a fire.

(f) Effect of fire on safe shutdown:

Since no equipment or cabling associated with shutdown methods A or B (as described in Section 5.2.2) is located in this fire area, both of these methods will remain available to safely shut the plant down.

LEGEND FOR TABLE A-1

The information presented in each column of Table A-1 is explained as follows:

Item No.:	Identification code for fire areas and fire zones. Fire zones with identification codes beginning with the same number are located in the same fire area.
Structure & Elev.:	Location of the fire area or fire zone, by structure and elevation. Locations are shown on drawings B-4 through B-12.
Space Designated:	Description of compartments included within the fire area or fire zone.
Safety-Related:	Indicates whether or not the fire area or zone contains safety-related equipment or electrical cabling.
Area:	Floor area of the fire area or fire zone.
Class:	Fire classification as defined in NFPA 10, Section 1.3.
Quantity:	Quantity of combustible material located within the fire area or zone, by weight for solids and by volume for liquids.
Combustible Loading:	Equivalent weight of all combustible material within a fire area or zone, in pounds of wood per square foot of floor area.
Equivalent Severity:	A normalization of standard time-temperature curves based on the combustible loading in a fire area or fire zone (as described in Section 4.2).
Structural Fire Resistance Rating:	Rating in hours based on the type of construction of each wall, floor, and ceiling that forms part of the boundary of a fire area or fire zone. (The ratings listed in this table apply to the major portion of the boundary on each side of a fire area or fire zone. In those cases where the boundary on one side of a fire area consists of segments with different types of construction,

	small areas with lower fire ratings or zero fire ratings may exist. For a more detailed description of the ratings of the boundaries of the various fire areas, refer to the fire area discussions contained in Sections 5.3 through 5.9).
Detection Capability:	Type of fire detectors and number of detectors provided in the fire area or zone. Unless indicated otherwise, all smoke detectors are of the ionization type.
Suppression Capability:	Type of fire suppression system and method of actuation in the fire area or zone.

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MAT
1A	Control	180-0	Corridor 164	No	500	None
1B	"	"	Corridor 166	No	500	Cable in
1C	"	"	Recombiner room 154	No	670	None
1D	"	"	Recombiner room 155	No	670	None
1E	"	"	Future recombiner room 153	No	670	None
1F	"	"	Future recombiner room 156	No	670	None
1G	"	"	Backwash receiving tank room 163	No	680	Cable in
1H	"	"	Backwash receiving tank room 157	No	680	Cable in
1J	"	"	Backwash transfer pump room 161 & 162	No	360	Cable in
1K	"	"	Backwash transfer pump rooms 158 & 159	No	360	Cable in
1L	"	200-0	Control structure chillers and chilled water pump area 258	Yes	2200	Cable in
1M	"	"	Control structure chillers and chilled water pump area 263	Yes	2200	Cable in
1N	"	"	Recombiner access area 259	Yes	1405	None
2	"	217-0	13-kV switchgear area 336	Yes	6570	Cable in
3	"	"	Battery room 323	Yes	144	Battery
4	"	"	Battery room 324	Yes	128	Cable in Battery
5	"	"	Battery room 360	Yes	144	Battery
6	"	"	Battery room 361	Yes	144	Battery
7	"	239-0	Corridor 437	Yes	528	Cable in
8	"	"	Battery room 425	Yes	470	Battery

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TABLE A-1

FIRE PROTECTION EVALUATION

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
ERIAL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
	-	-	-	-	0	0	0	3	0	3	-	-	Hose station	Manual
sulation	C	150 lb	0.37	3	0	0	3	0	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	3	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	3	-	-	Hose station	Manual
sulation	C	782 lb	1.43	9	0	3	0	3	0	3	-	-	Hose station	Manual
sulation	C	782 lb	1.43	9	0	3	3	0	0	3	-	-	Hose station	Manual
sulation	C	350 lb	1.21	8	0	3	0	0	0	3	-	-	Hose station	Manual
sulation	C	350 lb	1.21	8	0	3	0	0	0	3	-	-	Hose station	Manual
sulation	C	749 lb	0.42	3	0	0	0	3	3	0	Smoke	3	Hose station	Manual
sulation	C	749 lb	0.42	3	0	0	3	0	3	0	Smoke	3	Hose station	Manual
	-	-	-	-	3	0	3	2	3	0	-	-	Hose station	Manual
sulation	C	8736 lb	1.65	10	3	3	3	3	3	3	Smoke	34	CO_2 hose reel	Manual
cases	A	30 lb	0.36	3	2	3	3	3	3	3	Smoke Heat	1 1	CO_2 hose reel	Manual
sulation cases	C A	83 lb 30 lb	1.22	8	3	3	3	3	3	3	Smoke Heat	1 1	CO_2 hose reel	Manual
cases	A	30 lb	0.36	3	3	3	3	3	3	3	Smoke Heat	1 1	CO_2 hose reel	Manual
cases	A	30 lb	0.36	3	3	3	3	3	3	3	Smoke Heat	1 1	CO_2 hose reel	Manual
sulation	C	2246 lb	5.29	32	3	3	3	3	3	3	Smoke	5	Hose station	Manual
cases	A	120 lb	0.45	3	3	3	3	3	3	3	Smoke Heat	2 1	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
9	Control	239-0	Battery room 436	Yes	470	Battery cas
10	"	"	Battery room 426	Yes	468	Battery cas
11	"	"	Battery room 427	Yes	442	Battery cas
12	"	"	4-kV switchgear compartment 434	Yes	470	Cable insul
13	"	"	4-kV switchgear compartment 435	Yes	470	Cable insul
14	"	"	4-kV switchgear compartment 432	Yes	400	Cable insul
15	"	"	4-kV switchgear compartment 433	Yes	400	Cable insul
16	"	"	4-kV switchgear compartment 430	Yes	400	Cable insul
17	"	"	4-kV switchgear compartment 431	Yes	400	Cable insul
18	"	"	4-kV switchgear compartment 428	Yes	470	Cable insul
19	"	"	4-kV switchgear compartment 429	Yes	470	Cable insul
20	"	254-0	Static inverter room unit 1, area 452	Yes	715	Cable insul
21	"	"	Static inverter room unit 2, area 453	Yes	1000	Cable insul
22	"	"	Cable spreading room unit 1	Yes	2610	Cable insul
23	"	"	Cable spreading room unit 2	Yes	2610	Cable insul
24A	"	269-0	Control room 533	Yes	5208	Cable insul

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
es	A	120 lb	0.45	3	3	3	3	3	3	3	Smoke Heat	2 1	Hose station	Manual
es	A	120 lb	0.45	3	3	3	3	3	3	3	Smoke Heat	3 3	Hose station	Manual
es	A	120 lb	0.48	3	3	3	3	3	3	3	Smoke Heat	2 1	Hose station	Manual
ation	C	250 lb	0.66	4	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	167 lb	0.44	3	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	250 lb	0.78	5	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	167 lb	0.52	4	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	250 lb	0.78	5	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	167 lb	0.52	4	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	250 lb	0.66	4	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	167 lb	0.44	3	3	3	3	3	3	3	Smoke Heat	2 2	Hose station	Manual
ation	C	9558 lb	16.63	128	2	3	3	3	3	3	Smoke	4	Hose station	Manual
ation	C	11814 lb	14.69	115	3	3	3	3	3	3	Smoke	6	Hose station	Manual
ation	C	35526 lb	16.93	130	3	3	3	3	3	3	Smoke	14	CO_2 total flood	Automatic
ation	C	35526 lb	16.93	130	3	3	3	3	3	3	Smoke	14	CO_2 total flood	Automatic
ation	C	4327 lb	1.03	7	3	3	1	1	3	3	Smoke Smoke	23(1) 10(2)	CO_2 hose reel	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
24B	Control	269-0	Control room utility room 529	Yes	224	None
24C	"	"	Control room office 531	Yes	256	None
24D	"	"	Control room shift supt. 532	Yes	320	None
24E	"	"	Control room shop 534	Yes	256	None
24F	"	"	Control room instrument lab 535	Yes	384	None
25A	"	289-0	Auxiliary equipment room 542	Yes	6676	Cable insul
25B	"	"	Remote shutdown panel area 540	Yes	192	None
27	"	304-0	Control structure fan room 619	Yes	6450	Cable insul Charcoal
28A	"	332-0	SGTS access area 625	Yes	5450	Charcoal
28B	"	332-0	SGTS filter compartment 624	Yes	1872	Charcoal
28C	"	"	Control room fresh air intake plenum	Yes	320	None
29A	Unit 1 primary contaiment	181-11	Suppression chamber 101	Yes	5464	None
29B	"	"	Supression chamber inside pedestal	Yes	314	None
29C	"	217-0	Drywell drain sump area	Yes	314	None
30A	"	237-11	Drywell area 400	Yes	2865	Cable insul Lubricating
30B	"	"	Drywell inside pedestal	Yes	661	Cable insul

AL	FIRE HAZARD CLASS	FIRE HAZARD QUANTITY	COMBUSTIBLE LOADING (lb/ft^2)	EQUIVALENT SEVERITY (Minutes)	N	S	E	W	UP	DN	DETECTION CAPABILITY TYPE	DETECTION CAPABILITY NO.	SUPPRESSION CAPABILITY TYPE	SUPPRESSION CAPABILITY ACTUATION
	-	-	-	-	0	3	3	1	1	3	Smoke	1	CO_2 hose reel	Manual
	-	-	-	-	0	0	3	1	1	3	Smoke	1	CO_2 hose reel	Manual
	-	-	-	-	3	0	3	1	1	3	Smoke	1	CO_2 hose reel	Manual
	-	-	-	-	0	3	1	3	1	3	Smoke (Photo-Elect)	1	CO_2 hose reel	Manual
	-	-	-	-	2	0	1	3	1	3	Smoke (Photo-Elect)	1	CO_2 hose reel	Manual
ation	C	16640 lb	3.10	20	3	3	3	3	3	3	Smoke Smoke	27[3] 23[4]	Halon (raised flr)	Automatic
	-	-	-	-	2	0	0	3	3	3	Smoke Smoke	1[3] 2[4]	Halon (raised flr)	Automatic
ation	C A	250 lb 8750 lb	2.24	14	3	3	3	3	3	3	Smoke Heat (inside plenum)	10 2	Filter water spray system	Manual
	A	3435 lb	1.02	8	0	3	3	3	3	3	Heat (inside plenum)	2	Filter water spray system	Manual
	A	20000 lb	17.25	130	0	0	0	0	0	3	Heat (inside plenum)	2	Filter water spray system	Manual
	-	-	-	-	0	0	0	2	3	3	Smoke	3	-	-
	-	-	-	-	3	3	3	3	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	-	-
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
tion oil	C B	3328 lb 108 gal	2.14	12	3	3	3	3	0	0	-	-	Hose station	Manual
tion	C	4992 lb	9.39	65	0	0	0	0	0	0	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
31	Unit 1 reactor	177-0	RHR heat exchanger & pump room 103	Yes	2050	Lubricating Cable insul
32	"	"	RHR heat exchanger & pump room 102	Yes	1700	Lubricating Cable insul
33	"	"	RCIC pump room 108	Yes	600	Lubricating Cable insul
34	"	"	HPCI pump room 109	Yes	1100	Lubricating Cable insul
35	"	"	Core spray pump room 110	Yes	575	Lubricating Cable insul
36	"	"	Core spray pump room 113	Yes	600	Lubricating Cable insul
37	"	"	Core spray pump room 114	Yes	600	Lubricating Cable insul
38	"	"	Core spray pump room 117	Yes	575	Lubricating Cable insul
39	"	"	Sump room 115; passageway 118	Yes	1700	Lubricants Cable insul
40	"	"	Corridor 111	Yes	525	Cable insul
41	"	201-0	RECW equipment area 207	Yes	4020	Lubricants Cable insul
42A	"	"	Safeguard system access area 200	Yes	3178	Cable insul
42B	"	"	Isolation valve compartment 209	Yes	280	None
43	"	217-0	Safeguard system isolation valve area 309	Yes	2350	Cable insul
44	"	"	Safeguard system access area 304	Yes	8930	Cable insul
45A	"	253-0	CRD hydraulic equipment area 402	Yes	12860	Cable insul

	FIRE HAZARD		COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
l	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
oil tion	B C	72 gal 333 lb	0.85	6	3	3	3	3	0	3	Smoke	4	Hose station	Manual
oil tion	B C	72 gal 333 lb	1.02	8	3	3	3	3	0	3	Smoke	4	Hose station	Manual
oil tion	B C	80 gal 167 lb	2.79	18	3	2	3	3	0	3	Smoke	3	Pre-action sprinkler system	Automatic
oil tion	B C	155 gal 167 lb	2.77	18	3	3	3	3	0	3	Smoke	3	Pre-action sprinkler system	Automatic
oil tion	B C	24 gal 167 lb	1.13	10	3	3	3	3	3	3	Smoke	2	Hose station	Manual
oil tion	B C	24 gal 167 lb	1.08	9	3	3	3	3	3	3	Smoke	2	Hose station	Manual
oil tion	B C	24 gal 167 lb	1.08	9	3	3	3	3	3	3	Smoke	2	Hose station	Manual
oil tion	B C	24 gal 167 lb	1.13	10	3	3	3	3	3	3	Smoke	2	Hose station	Manual
 tion	B C	Negligible 499 lb	0.37	5	3	3	3	3	3	3	Smoke	1	Hose station	Manual
tion	C	Negligible	<0.1	-	2	3	3	3	3	3	-	-	Hose station	Manual
 tion	B C	0.25 gal 2330 lb	0.73	7	3	3	3	3	3	3	Smoke	3	Hose station	Manual
tion	C	3578 lb	1.40	9	3	2	3	3	3	3	Smoke	3	Hose station	Manual
	-	-	-	-	3	3	3	0	3	3	-	-	Hose station	Manual
tion	C	2912 lb	1.54	10	3	3	3	3	3	0	Smoke	10	Hose station	Manual
tion	C	28290 lb	3.94	22	3	3	3	3	3	3	Smoke	25	Hose station	Manual
tion	C	17306 lb	1.67	10	3	3	3	3	3	3	Smoke	19	Sprinkler system (partial)	Automatic

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATER
45B	Unit 1 reactor	253-0	Neutron monitoring system area 406	Yes	630	Cable insu
45C	"	"	CRD repair room 403	No	785	None
46	"	"	Main steam tunnel	Yes	384	None
47A	"	283-0	Corridor 506; general equipment area 500	Yes	9800	Cable insu
47B	"	295-3	Isolation valve compartment 518	Yes	750	Cable insu
47C	"	283-0	Fuel pool cooling water pump and heat exchanger area 511	No	1660	Cable insu
47D	"	"	Isolation valve compartment 510	Yes	580	None
47E	"	"	RWCU pump room 509	No	160	None
47F	"	"	RWCU pump room 508	No	130	None
47G	"	"	RWCU pump room 507	No	145	None
47H	"	"	Non-regen heat exchanger area 505	No	420	None
47J	"	"	Non-regen heat exchanger area 504	No	420	None
47K	"	"	Regen heat exchanger area 503	No	420	None
47L	"	"	RWCU backwash receiving tank area 502	No	400	None
47M	"	"	Isolation valve compartment 501	Yes	470	None
48A	"	313-0	Laydown areas 601 and 602; corridor and RERS fan area 605	Yes	6500	Cable insu
48B	"	"	RWCU holding pump compartment	No	216	None
48C	"	"	RWCU holding pump compartment	No	216	None
49	"	"	Reactor enclosure lower fan room 607	No	4320	Cable insu
50A	"	331-0	Reactor enclosure upper fan room 615	No	2416	None

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
IAL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
lation	C	1331 lb	2.63	16	0	0	0	3	0	3	Smoke	5	Hose station	Manual
	-	-	-	-	0	2	0	3	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	3	3	3	3	0	3	-	-	Hose station	Manual
lation	C	17971 lb	2.28	14	3	3	3	3	3	3	Smoke	20	Sprinkler system (partial)	Automatic
lation	C	1248 lb	2.07	12	3	3	0	0	3	3	Smoke	2	Hose station	Manual
lation	C	1498 lb	1.12	7	0	0	3	0	0	3	Smoke	2	Hose station	Manual
	-	-	-	-	0	0	3	0	3	3	Smoke	2	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	3	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	3	Smoke	1	Hose station	Manual
lation	C	3744 lb	0.72	5	3	3	3	3	3	3	Smoke	8	Hose station	Manual
	-	-	-	-	0	0	0	0	3	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	3	3	-	-	Hose station	Manual
lation	C	624 lb	0.18	1	3	0	3	3	0	3	-	-	Hose station	Manual
	-	-	-	-	0	3	3	3	3	0	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
50B	Unit 1 reactor	331-0	Equipment compartment exhaust filter room 616	No	468	Charcoal
50C	"	"	Equipment compartment exhaust filter room 617	No	468	Charcoal
51A	"	"	RERS filter compartment 618	Yes	720	Charcoal
51B	"	"	RERS filter compartment 618	Yes	720	Charcoal
52A	Unit 2 primary containment	181-11	Suppression chamber 172	Yes	5464	None
52B	"	"	Suppression chamber inside pedestal	Yes	314	None
52C	"	217-0	Drywell drain sump area	Yes	314	None
53A	"	237-11	Drywell area 473	Yes	2865	Cable insul Lubricating
53B	"	"	Drywell inside pedestal	Yes	661	Cable insul
54	Unit 2 reactor	177-0	RHR heat exchanger & pump room 173	Yes	2050	Lubricating Cable insul
55	"	"	RHR heat exchanger & pump room 174	Yes	1700	Lubricating Cable insul
56	"	"	RCIC pump room 179	Yes	600	Lubricating Cable insul
57	"	"	HPCI pump room 180	Yes	1100	Lubricating Cable insul
58	"	"	Core spray pump room 181	Yes	575	Lubricating Cable insul

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
	A	11175 lb	38.56	310	3	0	0	3	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	A	11175 lb	38.56	310	3	0	0	0	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	A	5000 lb	11.22	80	3	3	0	3	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	A	5000 lb	11.22	80	3	3	3	0	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	-	-	-	-	3	3	3	3	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	-	-
ation oil	C B	3328 lb 108 gal	2.14	12	3	3	3	3	0	0	-	-	Hose station	Manual
ation	C	4992 lb	9.39	65	0	0	0	0	0	0	-	-	Hose station	Manual
oil ation	B C	72 gal 291 lb	0.82	6	3	3	3	3	0	3	Smoke	4	Hose station	Manual
oil ation	B C	72 gal 416 lb	1.08	9	3	3	3	3	0	3	Smoke	4	Hose station	Manual
oil ation	B C	80 gal 167 lb	2.79	18	3	2	3	3	0	3	Smoke	3	Pre-action sprinkler system	Automatic
oil ation	B C	155 gal 167 lb	2.77	18	3	3	3	3	0	3	Smoke	3	Pre-action sprinkler system	Automatic
oil ation	B C	24 gal 167 lb	1.13	10	3	3	3	3	3	3	Smoke	2	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATER
59	Unit 2 reactor	177-0	Core spray pump room 184	Yes	600	Lubricatin Cable insu
60	"	"	Core spray pump room 185	Yes	600	Lubricatin Cable insu
61	"	"	Core spray pump room 188	Yes	575	Lubricatin Cable insu
62	"	"	Sump room 186; passageway 189	Yes	1700	Lubricants Cable insu
63	"	"	Corridor 182	Yes	525	Cable insu
64A	"	201-0	RECW equipment area 284	Yes	4020	Lubricants Cable insu
64B	"	"	Isolation valve compartment 286	Yes	280	None
65	"	"	Safeguard system access area 279	Yes	3178	Cable insu
66	"	217-0	Safeguard system access area 376	Yes	2350	Cable insu
67	"	"	Safeguard system access area 370	Yes	8930	Cable insu
68A	"	253-0	CRD hydraulic equipment area 475	Yes	12860	Cable insu
68B	"	"	Neutron monitoring system area 479	Yes	630	Cable ins
68C	"	"	CRD repair room 476	Yes	785	None
69	"	"	Main steam tunnel	Yes	384	None
70A	"	283-0	Corridor 580; general equipment area 574	Yes	9800	Cable insu
70B	"	295-3	Isolation valve compartment 587	Yes	750	Cable insu
70C	"	283-0	Fuel pool cooling water pump and heat exchanger area 585	No	1660	Cable insu
70D	"	"	Isolation valve compartment 584	Yes	580	None

FIRE HAZARD			COMBUSTIBLE LOADING (lb/ft^2)	EQUIVALENT SEVERITY (Minutes)	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY			N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
oil ation	B C	24 gal 167 lb	1.08	9	3	3	3	3	3	3	Smoke	2	Hose station	Manual
oil ation	B C	24 gal 167 lb	1.08	9	3	3	3	3	3	3	Smoke	2	Hose station	Manual
oil ation	B C	24 lb 167 lb	1.13	10	3	3	3	3	3	3	Smoke	2	Hose station	Manual
 ation	B C	Negligible 499 lb	0.37	5	3	3	3	3	3	3	Smoke	1	Hose station	Manual
ation	C	Negligible	<0.1	-	2	3	3	3	3	3	-	-	Hose station	Manual
 ation	B C	0.25 gal 2912 lb	0.91	7	3	3	3	3	3	3	Smoke	3	Hose station	Manual
	-	-	-	-	3	3	3	0	3	3	-	-	Hose station	Manual
ation	C	3578 lb	1.40	9	3	2	3	3	3	3	Smoke	3	Hose station	Manual
ation	C	3203 lb	1.69	10	3	3	3	3	3	0	Smoke	10	Hose station	Manual
ation	C	31117 lb	4.34	26	3	3	3	3	3	3	Smoke	25	Hose station	Manual
ation	C	15559 lb	1.51	10	3	3	3	3	3	3	Smoke	19	Sprinkler system (partial)	Automatic
ation	C	1498 lb	2.96	18	3	0	0	3	0	3	Smoke	5	Hose station	Manual
	-	-	-	-	0	2	3	0	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	3	3	3	3	0	3	-	-	Hose station	Manual
ation	C	17056 lb	2.17	14	3	3	3	3	3	3	Smoke	20	Sprinkler sytem (partial)	Automatic
ation	C	1380 lb	2.28	14	3	3	0	0	3	3	Smoke	2	Hose station	Manual
ation	C	1647 lb	1.23	9	0	0	0	3	0	3	Smoke	2	Hose station	Manual
	-	-	-	-	0	0	0	3	3	3	Smoke	2	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MAT
70E	Unit 2 reactor	283-0	RWCU pump room 583	No	160	None
70F	"	"	RWCU pump room 582	No	130	None
70G	"	"	RWCU pump room 581	No	145	None
70H	"	"	Non-regen heat exchanger area 579	No	420	None
70J			Non-regen heat exchanger area 578	No	420	None
70K	"	"	Regen heat exchanger area 577	No	420	None
70L	"	"	Backwash receiving tank area 576	No	400	None
70M	"	"	Valve compartment 575	Yes	470	None
71A	"	313-0	Laydown areas 637 and 638; corridor and RERS fan area 641	Yes	6500	Cable in
71B	"	"	RWCU holding pump compartment	No	216	None
71C	"	"	RWCU holding pump compartment	No	216	None
72	"	"	Reactor enclosure lower fan room 643	No	4320	Cable in
73A	"	331-0	Reactor enclosure upper fan room 647	No	2416	None
73B	"	"	Equipment compartment exhaust filter room 648	No	468	Charcoal
73C	"	"	Equipment compartment exhaust filter room 649	No	468	Charcoal
74A	"	"	Recirc filter compartment 651	Yes	720	Charcoal
74B	"	"	Recirc filter compartment 651	Yes	720	Charcoal
75	Common reactor	198-0	Service water pipe tunnel	Yes	3840	None

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
ERIAL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	Smoke	1	Hose station	Manual
	-	-	-	-	3	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	3	Smoke	1	Hose station	Manual
sulation	C	4119 lb	0.79	5	3	3	3	3	3	3	Smoke	8	Hose station	Manual
	-	-	-	-	0	0	0	0	3	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	3	3	-	-	Hose station	Manual
sulation	C	705 lb	0.20	1	3	0	3	3	0	3	-	-	Hose station	Manual
	-	-	-	-	3	3	3	3	3	0	-	-	Hose station	Manual
	A	11175 lb	38.56	310	3	0	3	0	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	A	11175 lb	38.56	310	3	0	0	0	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	A	5000 lb	11.22	80	3	3	3	0	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	A	5000 lb	11.22	80	3	3	0	3	3	0	Heat (inside plenum)	1	Filter water spray system	Manual
	-	-	-	-	3	3	3	3	3	3	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATER
76	Common reactor	217-0	Refueling hoistway	No	960	None
77	"	-	South exhaust stack	No	620	None
78A	"	352-0	Refueling area	Yes	16640	None
78B	"	"	Shower and dressing area 701	No	3500	None
78C	"	"	Shower and dressing area 709	No	3500	None
79	Diesel-generator	217-0	Diesel-generator cell unit 1	Yes	1765	Fuel oil Lubricatin Cable insu
80	"	"	Diesel-generator cell unit 1	Yes	1765	Fuel oil Lubricatin Cable insu
81	"	"	Diesel-generator cell unit 1	Yes	1765	Fuel oil Lubricatin Cable insu
82	"	"	Diesel-generator cell unit 1	Yes	1765	Fuel oil Lubricatin Cable insu
83	"	"	Diesel-generator cell unit 2	Yes	1765	Fuel oil Lubricatin Cable insu
84	"	"	Diesel-generator cell unit 2	Yes	1765	Fuel oil Lubricatin Cable insu
85	"	"	Diesel-generator cell unit 2	Yes	1765	Fuel oil Lubricatin Cable insu
86	"	"	Diesel-generator cell unit 2	Yes	1765	Fuel oil Lubricatin Cable insu
87	Unit 1 turbine	189-0	Condensate pump room 256	No	1590	Cable insu

FIRE HAZARD			COMBUSTIBLE LOADING (lb/ft^2)	EQUIVALENT SEVERITY (Minutes)	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
IAL	CLASS	QUANTITY			N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
	-	-	-	-	3	3	3	3	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	-	-	-	-
	-	-	-	-	3	3	3	3	3	3	-	-	Hose station	Manual
	-	-	-	-	3	0	0	2	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	2	0	0	3	-	-	Hose station	Manual
g oil ation	B B C	800 gal 250 gal 666 lb	11.15	70	3	0	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
g oil ation	B B C	800 gal 250 gal 666 lb	11.15	70	3	0	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
oil ation	B B C	800 gal 250 gal 666 lb	11.15	70	3	0	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
oil ation	B B C	800 gal 250 gal 666 lb	11.15	70	3	0	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
oil ation	B B C	800 gal 250 gal 666 lb	11.15	70	3	0	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
oil ation	B B	800 gal 250 gal 666 lb	11.15	70	3	C	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
oil ation	B B C	800 gal 250 gal 666 lb	11.15	70	3	0	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
oil ation	B B C	800 gal 250 gal 666 lb	11.15	70	3	0	3	3	3	3	Flame Smoke Heat	1 4 1	Pre-action Sprinkler system	Automatic
ation	C	1165 lb	0.91	6	3	3	2	3	0	3	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
88A	Unit 1 turbine	200-0 239-0	Condenser area 254 and feedwater heater service area 438	No	12334	Cable insul
88B	"	"	Feedwater heater room 441	No	2220	Cable insul
88C	"	"	Feedwater heater room 440	No	2220	None
88D	"	"	Feedwater heater room 439	No	2220	None
89A	"	200-0	Control rod drive water pump area 252 and lube oil reservoir areas 260, 261, and 262 (area contains 3 reservoirs @ 1000 gal each)	No	9275	Lubricating Cable insul
89B	"	"	Condensate filter demineralizer compartments	No	2240	Cable insul
90	"	217-0	Air ejector and steam packing exhauster compartment 333	No	1610	Cable insul
91	"	"	Air ejector and steam packing exhauster compartment 334	No	1610	Cable insul
92	"	"	Vacuum pump room 337	No	702	Cale insula
93	"	"	Air compressor area 328; EHC power unit area 330; and lube oil storage tank area 331 (area 331 contains 3 tanks @ 16,000 gal each)	No	3420	Lubricating Cable insul
94A	"	"	Reactor feed pump access area 325; control panel area 341	No	11270	Cable insul
94B	"	"	Reactor feed pump turbine compartment 340	No	570	None
94C	"	"	Reactor feed pump turbine compartment 340	No	570	None
94D	"	"	Reactor feed pump turbine compartment 340	No	570	None
95	"	239-0	MCC room 442; TECW equipment area 445; lube oil equipment room 446 (room 446 contains lube oil reservoir)	No	3918	Lubricating Cable insul
96	"	"	Battery room 443	No	462	Battery cas

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
atior	C	28746 lb	2.90	18	0	0	3	3	0	0	-	-	Sprinkler system (partial)	Automatic
ation	C	1065 lb	0.60	4	0	3	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	3	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	3	0	0	0	0	-	-	Hose station	Manual
oil ation	B C	3000 gal Negligible	5.94	32	3	3	3	3	0	0	Heat	4	Sprinkler system (partial)	Automatic
ation	C	1915 lb	1.06	7	0	3	0	0	0	3	-	-	Hose station	Manual
ation	C	125 lb	0.10	1	3	3	3	3	0	3	-	-	Hose station	Manual
ation	C	108 lb	0.08	<1	3	3	3	3	0	3	-	-	Hose station	Manual
tion	C	874 lb	1.55	10	3	3	3	3	0	0	-	-	Hose station	Manual
oil ation	B C	48000 gal 2247 lb	258.50	1550	0	3	3	0	0	3	Heat	4	Sprinkler system (partial)	Automatic
ation	C	19261 lb	2.13	13	0	0	3	0	0	0	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	Heat	1	Hose station	Manual
oil ation	B C	13800 gal 7788 lb	67.14	403	3	3	3	0	0	0	Heat	3	Sprinkler system (partial) Deluge system (partial)	Automatic Automatic
es	A	240 lb	0.91	6		3	3	3	3	0	Smoke Heat	1 1	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
97	Unit 1 turbine	239-0	Equipment hatch corridor 448	No	3132	Cable insu
98A	"	269-0	Recirc pump motor-generator area 548	No	13020	Lubricatin Cable insu
98B	"	"	Feedwater heater room 547	No	880	None
98C	"	"	Feedwater heater room 546	No	880	None
98D	"	"	Feedwater heater room 545	No	880	None
99A	"	302-0	Turbine enclosure HVAC area 620	No	13080	Cable insu
99B	"	"	Turbine enclosure equipment compartment exhaust filter area 621	No	1228	Charcoal
100	Unit 2 turbine	189-0	Condensate pump room 266	No	1590	Cable insu
101A	"	200-0 239-0	Condenser area 268 and feedwater heater service area 464	No	12334	Cable insul
101B	"	"	Feedwater heater room 458	No	2220	Cable insul
101C	"	"	Feedwater heater room 457	No	2220	None
101D	"	"	Feedwater heater room 456	No	2220	None
102A	"	200-0	Control rod drive water pump area 270 and lube oil reservoir areas 274, 275, and 276 (area contains 3 reservoirs @ 1000 gal each)	No	9275	Lubricating Cable insul
102B	"	"	Condensate filter demineralizer compartments	No	2240	Cable insul
103	"	217-0	Air ejector and steam packing exhauster compartment 348	No	1610	Cable insul
104	"	"	Air ejector and steam packing exhauster compartment 349	No	1610	Cable insul
105	"	"	Vacuum pump room 350	No	702	Cable insul

FIRE HAZARD			COMBUSTIBLE LOADING (lb/ft²)	EQUIVALENT SEVERITY (Minutes)	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY			N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
ation	C	250 lb	0.10	1	3	3	3	0	0	0	-	-	Hose station	Manual
oil ation	B C	3000 gal 16640 lb	5.82	35	0	3	3	0	0	0	Smoke	13	Pre-action sprinkler system (partial)	Automatic
	-	-	-	-	3	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	-	-	Hose station	Manual
ation	C	2746 lb	0.26	2	3	0	0	0	0	0	Smoke	1	Hose station	Manual
	A	40000 lb	52.61	400	0	0	0	0	0	0	Heat (inside plenum)	2	Filter water spray system	Manual
ation	C	1165 lb	0.91	6	3	3	3	2	0	3	-	-	Hose station	Manual
ation	C	28746 lb	2.90	18	0	0	3	3	0	0	-	-	Sprinkler system (partial)	Automatic
ation	C	1065 lb	0.60	4	0	3	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	3	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	3	0	0	0	0	-	-	Hose station	Manual
oil ation	B C	3000 gal Negligible	5.94	32	3	3	3	3	0	0	Heat	4	Sprinkler system (partial)	Automatic
ation	C	1915 lb	1.06	7	0	3	0	0	0	3	-	-	Hose station	Manual
ation	C	125 lb	0.10	1	3	3	3	3	0	3	-	-	Hose station	Manual
ation	C	108 lb	0.08	<1	3	3	3	3	0	3	-	-	Hose station	Manual
ation	C	874 lb	1.55	10	3	3	3	3	0	0	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
106	Unit 2 turbine	217-0	Air compressor area 357; EHC power unit area 358; and lube oil storage tank area 356 (area 356 contains 3 tanks @ 16,000 gal each)	No	3420	Lubricating Cable insul
107A	"	"	Reactor feed pump access area 346; control panel area 354	No	11270	Cable insul
107B	"	"	Reactor feed pump turbine compartment 353	No	570	None
107C	"	"	Reactor feed pump turbine compartment 353	No	570	None
107D	"	"	Reactor feed pump turbine compartment 353	No	570	None
108	"	239-0	MCC room 459; TECW equiment area 461; lube oil equipment room 463 (room 463 contains lube oil reservoir)	No	3918	Lubricating Cable insul
109	"	"	Battery room 460	No	462	Battery cas
110	"	"	Equipment hatch corridor 466	No	3122	Cable insul
111A	"	269-0	Recirc pump motor-generator area 564	No	13020	Lubricating Cable insul
111B	"	"	Feedwater heater room 561	No	880	None
111C	"	"	Feedwater heater room 560	No	880	None
111D	"	"	Feedwater heater room 559	No	880	None
112A	"	302-0	Turbine enclosure HVAC area 628	No	13080	Cable insul
112B	"	"	Turbine enclosure equipment compartment exhaust filter area 629	No	1228	Charcoal
113A	Common turbine	217-0	Railroad access area 335	No	7632	Cable insul
113B	"	239-0	Generator equipment areas 447 and 465	No	16310	Cable insul Seal oil

TABLE A-1 (Cont'd)

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY	(lb/ft²)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
oil ation	B C	48000 gal 1248 lb	258.13	1550	0	3	0	3	0	3	Heat	4	Sprinkler system (partial)	Automatic
ation	C	19261 lb	2.13	13	0	0	0	3	0	0	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	Heat	1	Hose station	Manual
oil ation	B C	13800 gal 7788 lb	67.14	403	3	3	0	3	0	0	Heat	3	Sprinkler system (partial) Deluge system (partial)	Automatic Automatic
es	A	240 lb	0.91	6	3	3	3	3	3	0	Smoke Heat	1 1	Hose station	Manual
ation	C	250 lb	0.10	1	3	3	0	3	0	0	-	-	Hose station	Manual
oil ation	B C	3000 gal 16640 lb	5.82	35	0	3	0	3	0	0	Smoke	13	Pre-action sprinkler system (partial)	Automatic
	-	-	-	-	3	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	-	-	Hose station	Manual
ation	C	2746 lb	0.26	1	3	0	0	0	0	0	Smoke	1	Hose station	Manual
	A	40000 lb	52.61	400	0	0	0	0	0	0	Heat (inside plenum)	2	Filter water spray system	Manual
ation	C	9936 lb	1.6[illegible]	10	0	3	3	3	0	3	-	-	Pre-action sprinkler system	Automatic
ation	C B	36452 lb 1060 gal	3.98	23	0	3	3	3	0	0	-	-	Pre-action sprinkler system Deluge system (partial)	Automatic Automatic

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
114	Common turbine	269-0	Operating floor for units 1 and 2	No	45800	Cable insul
115A	Tunnel	187-0	Radwaste pipe tunnel	No	1280	None
115B	"	"	Radwaste pipe tunnel	No	1790	None
115C	"	183-0	Radwaste pipe tunnel	No	1680	None
115D	"	191-0	Radwaste pipe tunnel	No	510	None
116A	Radwaste	162-0	Pipe tunnel access	No	590	None
116B	"	"	Corridor 135	No	1096	Cable insul
116C	"	"	Corridor 149	No	496	Cable insul
116D	"	"	Corridor 152 and MCC room 145	No	318	Cable insul
116E	"	"	Waste sludge pump room 124	No	288	None
116F	"	"	Waste sludge tank room 123	No	576	None
116G	"	"	Condensate decant pump room 126	No	240	None
116H	"	"	Condensate sludge disch pump room 127	No	198	Cable insul
116J	"	"	Condensate phase separator room 125	No	800	None
116K	"	"	Condensate sludge disch pump room 129	No	192	None
116L	"	"	Condensate decant pump room 130	No	240	None
116M	"	"	Condensate phase separator room 128	No	800	None
116N	"	"	Chemical waste tank pump room 137	No	144	None
116P	"	"	Chemical waste tank room 136	No	144	None
116Q	"	"	Equip. drain collection tank room 131	No	864	None
116R	"	"	Equip. drain collection pump room 132	No	320	None
116S	"	"	Floor drain collection and sample tank room 134 and pump room 133	No	1824	Cable insula

TABLE A-1 (Cont'd)

FIRE HAZARD			COMBUSTIBLE LOADING (lb/ft²)	EQUIVALENT SEVERITY (Minutes)	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY			N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
ation	C	8320 lb	0.23	2	0	3	0	0	0	0	Heat Smoke	8 2	Pre-action sprinkler system (partial)	Automatic
	-	-	-	-	3	0	0	3	0	3	-	-	-	-
	-	-	-	-	3	3	0	0	0	3	-	-	-	-
	-	-	-	-	0	3	0	3	0	0	-	-	-	-
	-	-	-	-	0	3	3	3	0	0	-	-	-	-
	-	-	-	-	3	0	3	3	0	3	-	-	Hose station	Manual
ation	C	1539 lb	1.75	11	0	0	0	0	0	3	-	-	Hose station	Manual
ation	C	166 lb	0.42	3	0	0	0	2	0	3	-	-	Hose station	Manual
ation	C	957 lb	3.74	23	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	3	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
tion	C	208 lb	1.31	8	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	3	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	3	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	2	0	3	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	3	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	3	0	0	3	-	-	Hose station	Manual
tion	C	524 lb	0.36	3	0	0	3	0	0	3	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATER
116T	Radwaste	162-0	Floor drain spent resin pump rms 138 & 139	No	394	Cable insu
116U	"	"	Floor & equip. drain spent resin pump room 140	No	220	None
116V	"	"	RWCU decant pump room 142	No	242	Cable insu
116W	"	"	RWCU phase separator room 141	No	320	None
116X		"	RWCU sludge disch mixing pump room 144	No	253	Cable insu
116Y	"	"	RWCU phase separator room 143	No	320	None
116Z	"	"	Equip. & floor drain sump and pump room 146	No	206	Cable insu Charcoal
116AA	"	"	Equipment drain sample room 147	No	400	Cable insu
116BB	"	"	Equipment drain sample tank room 148	No	990	Cable insu
117	"	187-6	Offgas pipe tunnel	No	880	None
118A	"	191-0	Pipeway 221	No	384	None
118B	"	"	Corridors 213 and 235; fuel pool F/D precoat area	No	2721	Cable insu
118C	"	"	Corridor 246	No	496	Cable insu
118D	"	"	Laundry drain tank and pump room 228	No	792	Cable insu
118E	"	"	Evaporator pump room 231	No	288	Cable insu
118F	"	"	Evaporator pump room 232	No	240	Cable insu
118G	"	"	Evaporator tank room 230	No	576	None
118H	"	"	Evaporator tank room 234	No	250	None
118J	"	"	Evaporator tank room 233	No	250	None
118K	"	"	Control panel area	No	220	Cable insu
118L	"	"	Evaporator and condenser room 242	No	400	Cable insu
118M	"	"	Evaporator and condenser room 243	No	384	None

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY	(lb/ft²)	MINUTES	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
ation	C	125 lb	0.39	3	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	0	3	0	0	3	-	-	Hose station	Manual
ation	C	125 lb	0.64	4	0	0	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	2	0	0	3	0	3	-	-	Hose station	Manual
ation	C	125 lb	0.61	4	0	3	0	0	0	3	-	-	Hose station	Manual
	-	-	-	-	0	3	0	3	0	3	-	-	Hose station	Manual
ation	C A	125 lb 491 lb	4.60	28	0	0	3	0	0	3	Heat (inside plenum)	1	Filter water spray system	Manual
ation	C	83 lb	0.26	2	0	0	3	0	0	3	-	-	Hose station	Manual
ation	C	25 lb	0.03	<1	0	3	3	0	0	3	-	-	Hose station	Manual
	-	-	-	-	3	0	3	0	0	3	-	-	-	-
	-	-	-	-	3	0	3	0	0	3	-	-	Hose station	Manual
ation	C	6323 lb	2.89	18	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	125 lb	0.31	2	0	0	3	2	0	0	-	-	Hose station	Manual
ation	C	275 lb	0.43	3	0	0	0	0	0	0	-	-	Hose station	Manual
ation	C	83 lb	0.36	3	0	0	0	0	0	0	-	-	Hose station	Manual
ation	C	316 lb	1.64	10	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
ation	C	483 lb	2.73	17	0	0	0	0	0	0	-	-	Hose station	Manual
ation	C	441 lb	1.37	9	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATER
118N	Radwaste	191-0	Chemical addition room 244	No	432	None
118P	"	"	Fuel pool holding pump compartments 236	No	160	None
118Q	"	"	Fuel pool filter demin. compartment 239A	No	190	Cable insu
118R	"	"	Fuel pool filter demin. compartment 239B	No	165	Cable insu
118S	"	"	Fuel pool filter demin. compartment 239C	No	165	Cable insu
118T	"	"	Floor and equipment drain filter holding pump rooms 237 & 238	No	416	None
118U	"	"	Floor drain filter compartment 240A	No	158	Cable insu
118V	"	"	Floor drain demineralizer compartment 240B	No	168	Cable insu
118W	"	"	Equipment drain demineralizer compartment 241A	No	180	Cable insu
118X	"	"	Equipment drain filter compartment 241B	No	174	Cable insu
118Y	"	"	Floor and equipment drain surge tank pump room 248	No	355	Cable insu
118Z	"	"	Floor and equip. drain surge tank room 245	No	3200	None
119A	"	195-0	Corridor 214 and product storage area 225	No	4240	Cable insu
119B	"	"	Offgas adsorber compartment	No	800	Cable insu
119C	"	"	Offgas adsorber compartment	No	800	Cable insu
119D	"	"	Offgas adsorber compartment	No	800	Cable insu
119E	"	"	Offgas adsorber vault	No	192	None
119F	"	"	Offgas adsorber vault	No	192	None
119G	"	"	Offgas adsorber vault	No	192	None
119H	"	"	Reboiler area 226	No	1536	None
120A	"	217-0	Corridor 419	No	720	Cable insu

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
ation	C	166 lb	1.09	-	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	166 lb	1.25	8	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	166 lb	1.25	8	0	0	3	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
ation	C	166 lb	1.31	8	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	183 lb	1.36	9	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	191 lb	1.32	8	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	100 lb	0.71	5	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	166 lb	0.58	4	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	3	3	3	0	0	-	-	Hose station	Manual
ation	C	1664 lb	0.49	3	3	0	0	0	0	0	-	-	-	-
ation	C	416 lb	0.65	4	0	0	0	0	0	0	-	-	-	-
ation	C	416 lb	0.65	4	0	0	0	0	0	0	-	-	-	-
ation	C	416 lb	0.65	4	0	0	0	0	0	0	-	-	-	-
	-	-	-	-	0	0	0	3	0	0	-	-	-	-
	-	-	-	-	0	0	0	3	0	0	-	-	-	-
	-	-	-	-	0	0	0	3	0	0	-	-	-	-
	-	-	-	-	0	3	0	3	0	0	-	-	-	-
ation	C	33 lb	0.06	<1	3	0	3	0	0	0	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATERI
120B	Radwaste	217-0	Toilet 413	No	80	None
120C	"	"	Decontamination and change areas 414 and 414A	No	340	Cable insul
120D	"	"	Radwaste control room 415	No	594	Cable insul
120E	"	"	Health physics 412	No	128	None
120F	"	"	Clean clothes room 416	No	224	None
120G	"	"	Laundry room 417	No	320	None
120H	"	"	Counting room 410	No	160	None
120J	"	"	Conventional chemical lab 411	No	280	None
120K	"	"	Radiation chemical lab 418	No	400	None
120L	"	"	Corridor 424	No	3442	Cable insul
120M	"	"	Waste drum storage room 420	No	376	None
120N	"	"	Cask loading area 421; HSA & LSA fill station 422; decontamination and monitoring station 423	No	3856	Cable insul
121A	"	237-0	Air exhaust fan area 484	No	6320	Cable insul
121B	"	"	Filter room 485	No	480	None
121C	"	"	Filter room 486	No	480	None
121D	"	"	Solidification equipment room 472	No	220	None
121E	"	"	Hopper room 471	No	80	None
121F	"	"	Hopper room 470	No	80	None
121G	"	"	Solidification equipment room 469	No	72	None
121H	"	257-0	Exhaust fan area 525	No	5937	Cable insul
121J	"	"	Future equipment area 517	No	264	None

FIRE HAZARD			COMBUSTIBLE LOADING (lb/ft^2)	EQUIVALENT SEVERITY (Minutes)	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
AL	CLASS	QUANTITY			N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
	-	-	-	-	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	50 lb	0.18	1	0	0	3	0	0	0	-	-	Hose station	Manual
ation	C	1747 lb	3.66	22	0	0	0	0	0	0	Smoke	4	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	3	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	Heat	1	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	Heat	1	Hose station	Manual
ation	C	666 lb	0.24	2	0	0	3	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Sprinkler system	Automatic
ation	C	582 lb	0.19	2	0	0	0	3	0	0	-	-	Hose station	Manual
ation	C	998 lb	0.20	2	3	0	3	0	0	0	Smoke	-	Hose station	Manual
	-	-	-	-	3	0	0	3	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	3	0	0	-	-	Hose staion	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	3	0	0	-	-	Hose station	Manual
ation	C	998 lb	0.21	2	3	0	3	3	0	0	Smoke	10	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual

ITEM NO.	STRUCTURE	ELEV.	SPACE DESIGNATED	SAFETY-RELATED	AREA (sq ft)	MATER
121K	Radwaste	257-0	Centrifuge room 516	No	160	None
121L	"	"	Centrifuge room 515	No	160	None
121M	"	"	Air supply fan area 526	No	5004	Cable insu
122A	Spray pond pump structure	268-0	ESW and RHRSW pump area	Yes	1420	Lubricants Cable insu
122B	"	237-0	Wet pit	Yes	680	None
122C	"	251-0	ESW and RHRSW pipeway	Yes	570	None
122D	"	268-0	Access hatch area	Yes	544	None
122E	"	251-0	RHRSW valve compartment	Yes	560	Cable insu
122F	"	237-0	RHRSW pipeway	Yes	544	None
123A	"	268-0	ESW and RHRSW pump area	Yes	1420	Lubricants Cable insu
123B	"	237-0	Wet pit	Yes	680	None
123C	"	251-0	ESW and RHRSW pipeway	Yes	570	None
123D	"	268-0	Access hatch area	Yes	544	None
123E	"	251-0	RHRSW valve compartment	Yes	560	Cable insu
123F	"	237-0	RHRSW pipeway	Yes	544	None

(1) These smoke detectors are located below the suspended ceiling in the control room.

(2) These smoke detectors are located above the suspended ceiling in the control room.

(3) These smoke detectors are installed below the ceiling in the auxiliary equipment room.

(4) The smoke detectors are installed below the raised floor in the auxiliary equipment room, and do not include the smoke detectors inside the PGCC floor sections.

FIRE HAZARD			COMBUSTIBLE LOADING	EQUIVALENT SEVERITY	STRUCTURAL FIRE RESISTANCE RATING						DETECTION CAPABILITY		SUPPRESSION CAPABILITY	
IAL	CLASS	QUANTITY	(lb/ft^2)	(Minutes)	N	S	E	W	UP	DN	TYPE	NO.	TYPE	ACTUATION
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
	-	-	-	-	0	0	0	0	0	0	-	-	Hose station	Manual
lation	C	557 lb	0.14	1	0	3	3	0	0	0	-	-	Hose station	Manual
 lation	B C	Negligible 250 lb	0.22	2	0	0	3	0	3	0	Smoke	4	-	-
	-	-	-	-	0	0	3	0	0	3	-	-	-	-
	-	-	-	-	0	0	3	0	0	3	-	-	-	-
	-	-	-	-	0	0	0	3	3	0	-	-	-	-
lation	C	258 lb	0.57	4	0	0	0	3	0	0	Smoke	2	-	-
	-	-	-	-	0	0	0	3	0	3	-	-	-	-
 lation	B C	Negligible 250 lb	0.22	2	0	0	0	3	3	0	Smoke	4	-	-
	-	-	-	-	0	0	0	3	0	3	-	-	-	-
	-	-	-	-	0	0	0	3	0	3	-	-	-	-
	-	-	-	-	0	0	3	0	3	0	-	-	-	-
ation	C	258 lb	0.57	4	0	0	3	0	0	0	Smoke	2	-	-
	-	-	-	-	0	0	3	0	0	3	-	-	-	-

TABLE A-2

HEAT OF COMBUSTION VALUES

MATERIAL	HEAT OF COMBUSTION (Btu/lb)
Solids	
Charcoal	12,920
Battery cases (butadiene acrylonitrile)	14,000
Electrical cable insulation and jacketing	9,950
Liquids	
Lubricating oils and lubricants[1]	20,400
Fuel oil[1]	19,800

[1]Oil is assumed to weigh 7.2 pounds per gallon

TABLE A-3

INSULATION AND JACKETING MATERIALS
USED FOR ELECTRICAL CABLING

CABLE APPLICATION	INSULATION	JACKETING
Communication	Polyvinyl chloride	Polyvinyl chloride
Lighting	Thermoplastic (THHN, THWN, or THW)	None
Instrumentation	Cross-linked polyethylene	Neoprene
	Flamtrol (flame-retardant cross-linked polyolefin)	Flamtrol
Coaxial and triaxial	Cross-linked polyolefin	Cross-linked polyolefin
600V control	Cross-linked polyethylene	Neoprene
	Rubber	Neoprene
	Rockbestos "Heatzone I"	Rockbestos "Heatzone I"
600V power	Cross-linked polyethylene	Neoprene
	Ethylene propylene rubber	Hypalon
5-kV and 15-kV power	Ethylene propylene rubber	Hypalon
	Ethylene propylene rubber	Semi-conducting chlorinated polyethylene

TABLE A-3 (Cont'd)

CABLE APPLICATION	INSULATION	JACKETING
Computer cables	Cross-linked polyethylene	Neoprene
	Rayolin F (cross-linked radiation-resistant polyolefin)	Flamtrol
Multi-conductor(1)	Cross-linked polyethylene	Neoprene
Multi-conductor (shielded)(1)	Cross-linked polyethylene or cross-linked modified polyolefin	Neoprene or cross-linked polyolefin
Twisted shielded pairs(1)	Cross-linked polyalkene and polyvinylidene fluoride	Cross-linked modified polyolefin
Thermocouple(1)	Cross-linked polyethylene	Cross-linked polyethylene
Coaxial (RG type)(1)	Cross-linked polyethylene	Cross-linked polyethylene
Coaxial (twin conductor)(1)	Alkaneimide polymer cross-linked polyolefin	Cross-linked polyethylene
Coaxial (high temperature, radiation resistant)(1)	Cross-linked polyethylene	Cross-linked polyethylene

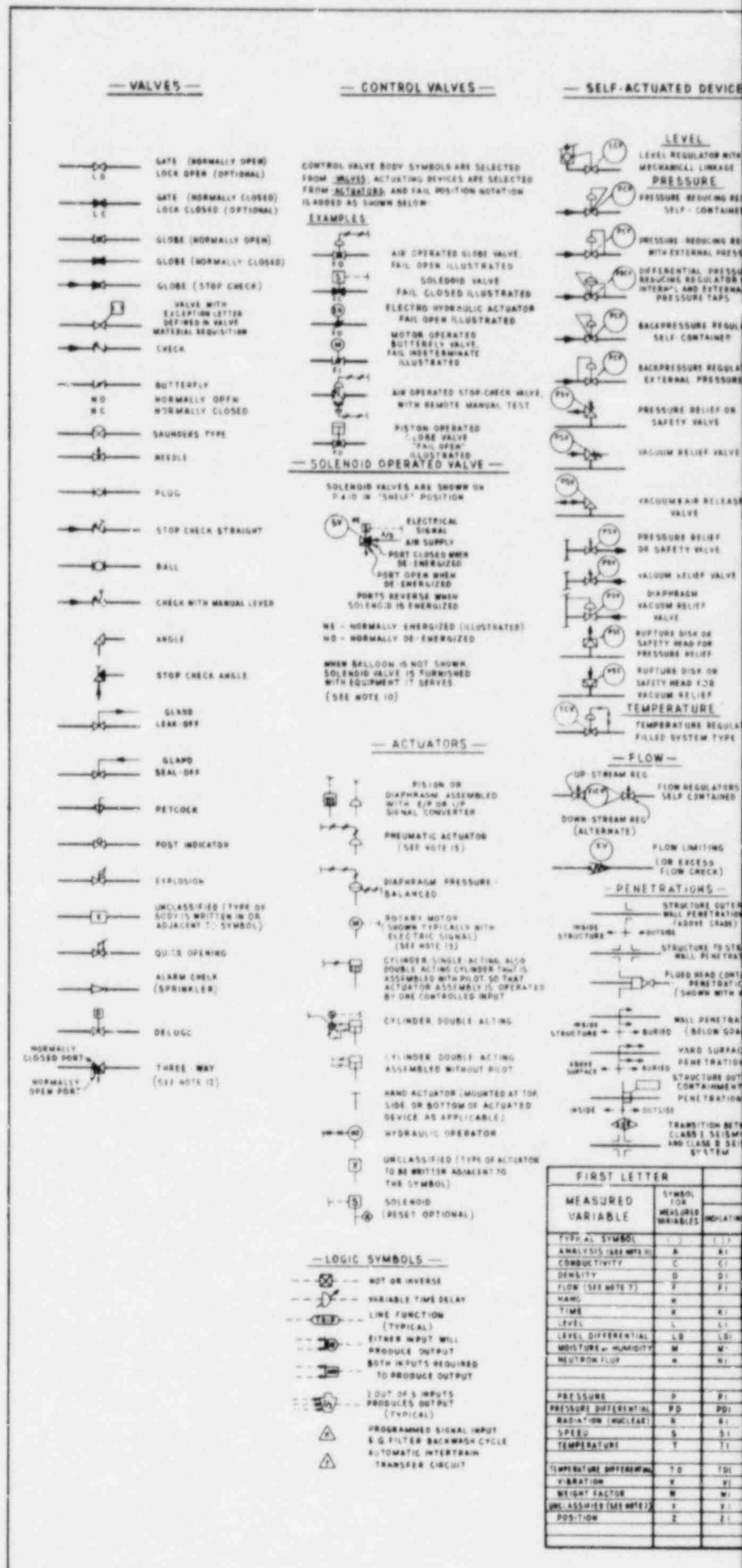
TABLE A-3 (Cont'd)

CABLE APPLICATION	INSULATION	JACKETING
Twisted pairs or twisted triples (high performance)[1]	Polyalkene and polyvinylidene fluoride	Cross-linked polyvinylidene fluoride and cross-linked polyolefin

[1] These cables are associated with the PGCC.

[2] Insulation for lighting cables is specified as flame retardant in accordance with the National Electric Code. Insulation and jacketing for all other cables, with the exception of communications cables, are specified to meet the IEEE No. 383 flame test requirements.

[3] Ignition of electrical cabling, in the absence of a fire source external to the cabling, is extremely unlikely. The consequences of an overload condition are minimized by conservative cable ratings and by the use of overload devices in power circuits and fault current interrupting devices in essentially all circuits. In addition, cable insulation and jacketing materials are chosen for their fire retardant and self-extinguishing properties, such that fuel contribution to a cable fire is minimized and propagation of a fire along cables is self-limiting.

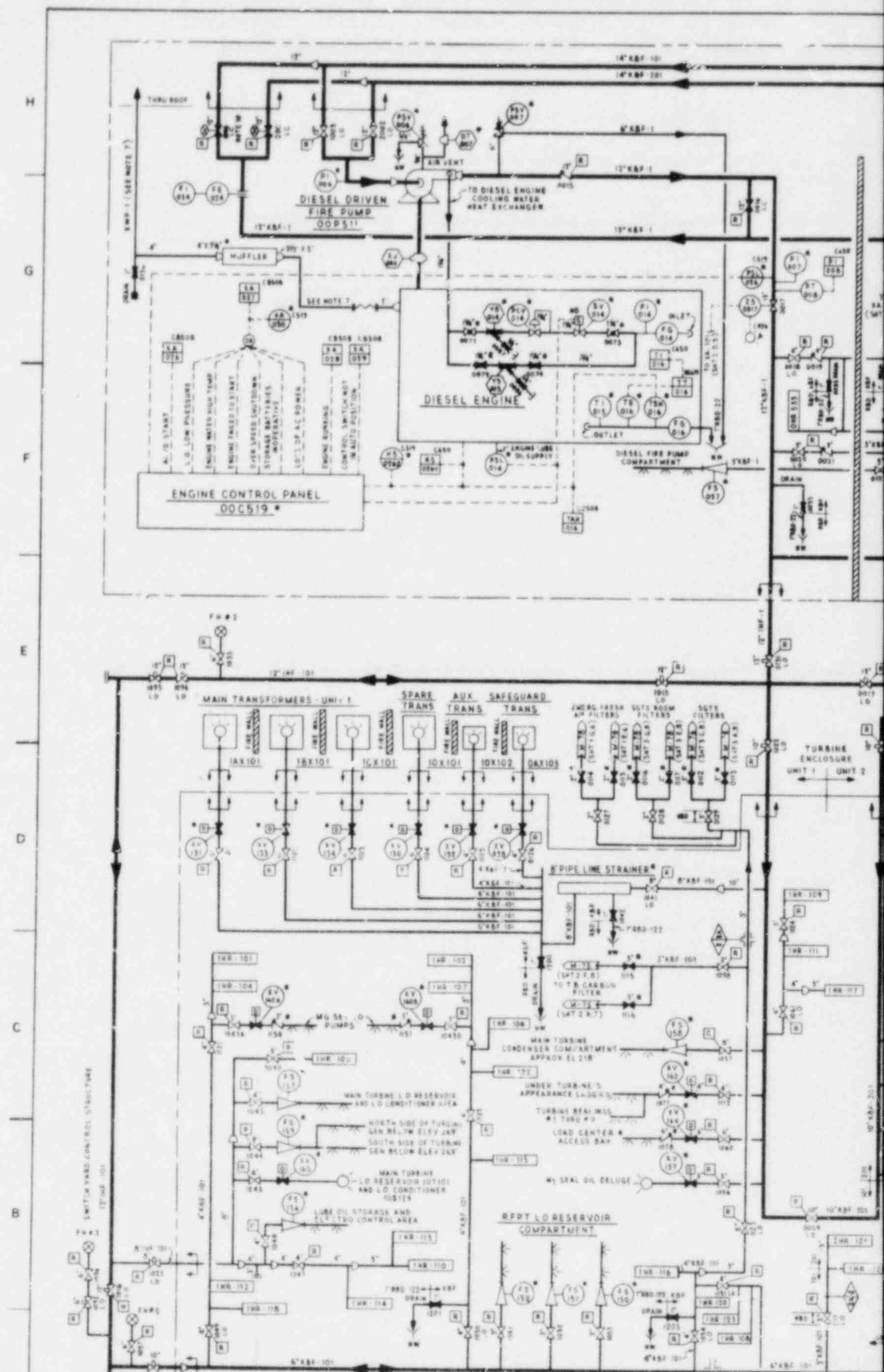


FIRST LETTER		
MEASURED VARIABLE	SYMBOL FOR MEASURED VARIABLES	INDICATIN
TYPICAL SYMBOL	( )	( )I
ANALYSIS (SEE NOTE 6)	A	AI
CONDUCTIVITY	C	CI
DENSITY	D	DI
FLOW (SEE NOTE 7)	F	FI
HAND	H	
TIME	K	KI
LEVEL	L	LI
LEVEL DIFFERENTIAL	LD	LDI
MOISTURE or HUMIDITY	M	MI
NEUTRON FLUX	N	NI
PRESSURE	P	PI
PRESSURE DIFFERENTIAL	PD	PDI
RADIATION (NUCLEAR)	R	RI
SPEED	S	SI
TEMPERATURE	T	TI
TEMPERATURE DIFFERENTIAL	TD	TDI
VIBRATION	V	VI
WEIGHT FACTOR	W	WI
UNCLASSIFIED (SEE NOTE 2)	X	XI
POSITION	Z	ZI

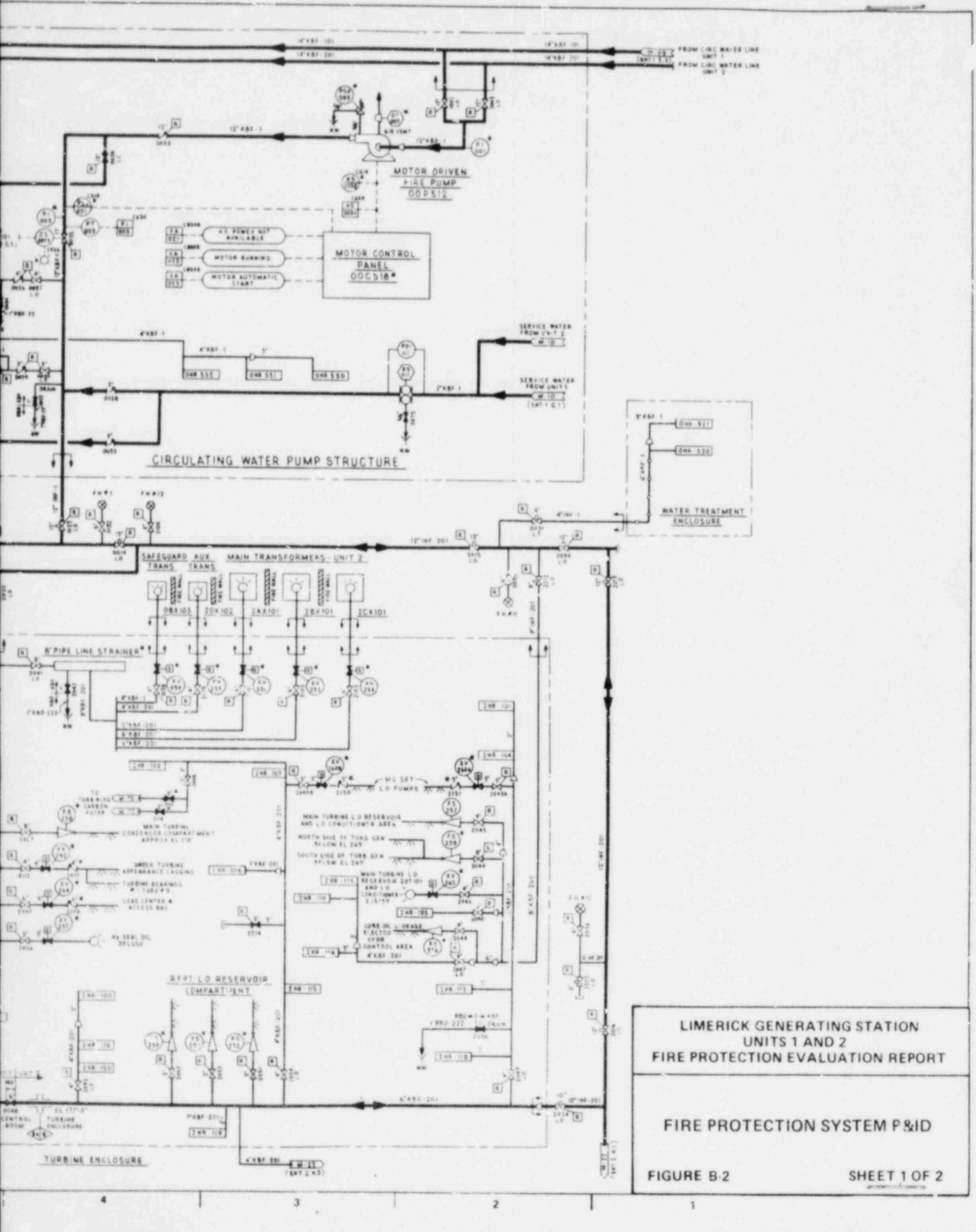
LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

P&ID LEGEND AND SYMBOLS

FIGURE B-1



THRU ROOF
AIR VENT
TO DIESEL ENGINE COOLING WATER HEAT EXCHANGER
DIESEL DRIVEN
FIRE PUMP
00P511
MUFFLER
SEE NOTE 7
DIESEL ENGINE
OUTLET
DIESEL FIRE PUMP COMPARTMENT
ENGINE CONTROL PANEL
00C519
MAIN TRANSFORMERS - UNIT 1
SPARE TRANS
AUX TRANS
SAFEGUARD TRANS
1AX101
1BX101
1CX101
10X101
10X102
0AX103
TURBINE ENCLOSURE
UNIT 1
UNIT 2
8" PIPE LINE STRAINER
MG SET LO PUMPS
MAIN TURBINE CONDENSER COMPARTMENT
MAIN TURBINE LO RESERVOIR AND LO CONDITIONER AREA
RFPT LO RESERVOIR COMPARTMENT
SWITCH YARD CONTROL STRUCTURE
TURBINE ENCLOSURE
CONTROL ROOM
H
G
F
E
D
C
B
A
8
7
6
5

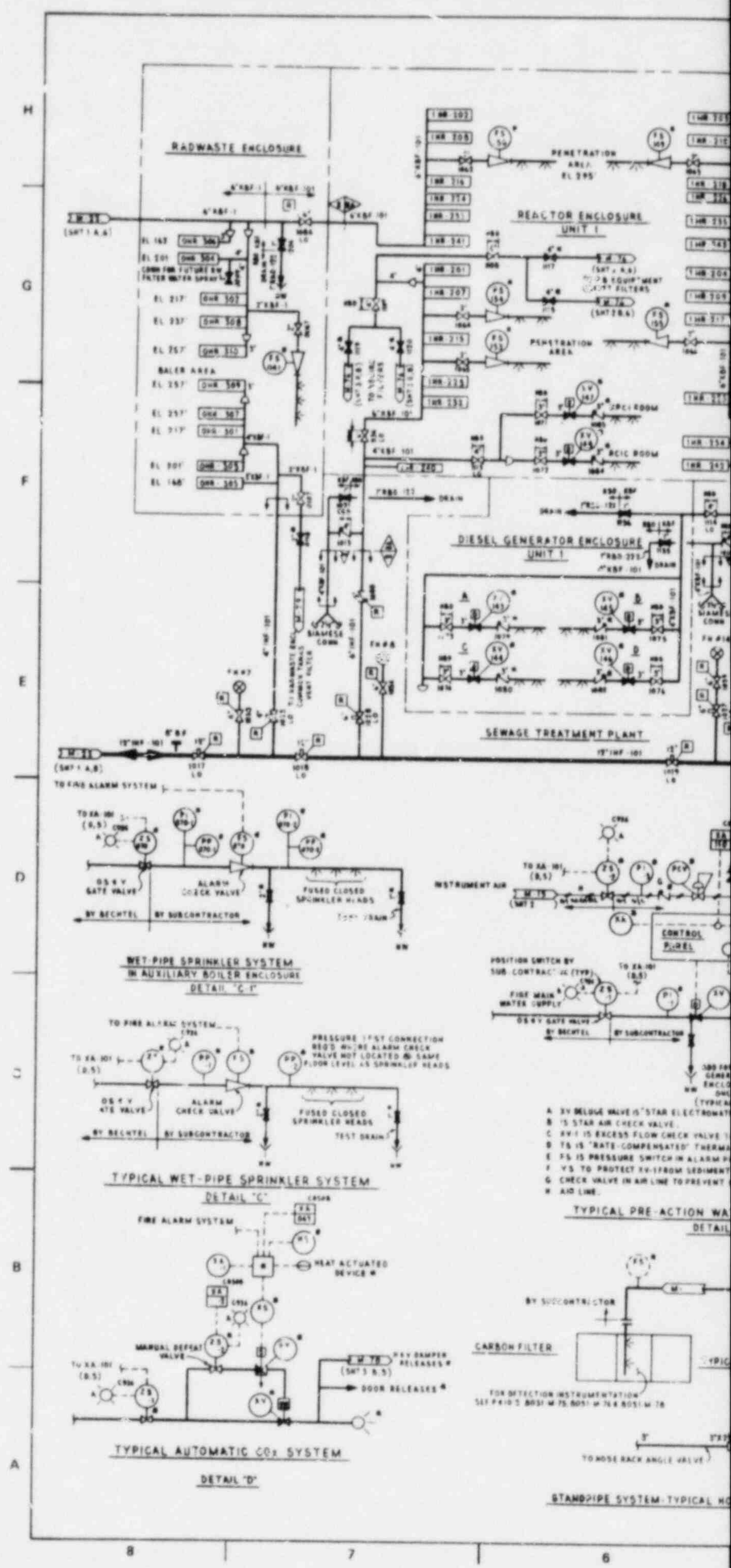


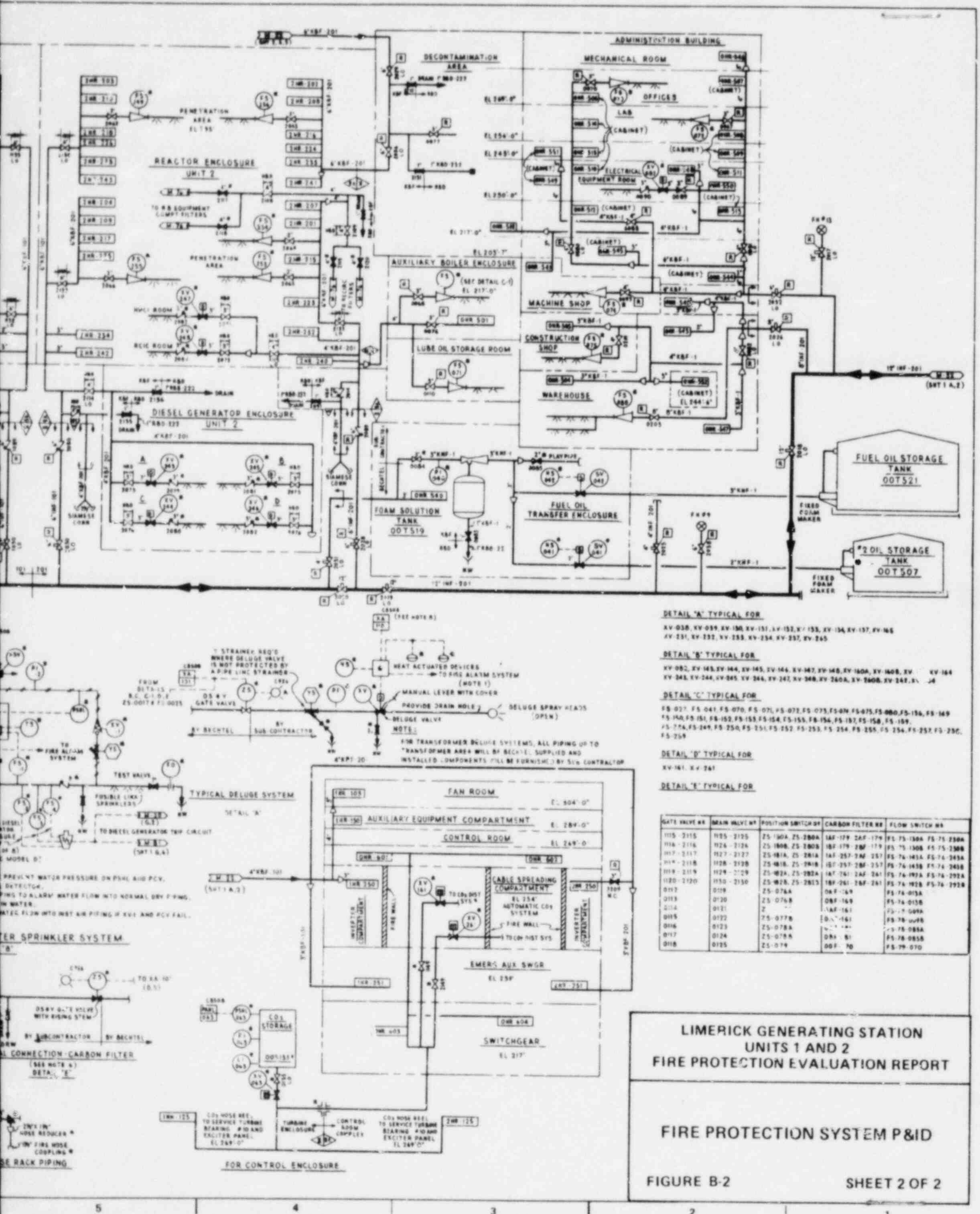
LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

FIRE PROTECTION SYSTEM P&ID

FIGURE B-2

SHEET 1 OF 2


RADWASTE ENCLOSURE
REACTOR ENCLOSURE UNIT 1
PENETRATION AREA EL 295'
PENETRATION AREA
BALER AREA
RCIC ROOM
DIESEL GENERATOR ENCLOSURE UNIT 1
SEWAGE TREATMENT PLANT
SIAMESE CONN
TO FIRE ALARM SYSTEM
INSTRUMENT AIR
CONTROL PANEL
OS & Y GATE VALVE
ALARM CHECK VALVE
FUSED CLOSED SPRINKLER HEADS
BY BECHTEL
BY SUBCONTRACTOR
WET-PIPE SPRINKLER SYSTEM IN AUXILIARY BOILER ENCLOSURE
DETAIL "C-1"
TYPICAL WET-PIPE SPRINKLER SYSTEM
DETAIL "C"
FIRE ALARM SYSTEM
HEAT ACTUATED DEVICE
MANUAL DEFEAT VALVE
DOOR RELEASES
TYPICAL AUTOMATIC CO2 SYSTEM
DETAIL "D"
TYPICAL PRE-ACTION WA
CARBON FILTER
BY SUBCONTRACTOR
TO HOSE RACK ANGLE VALVE
STANDPIPE SYSTEM-TYPICAL HO
H
G
F
E
D
C
B
A
8
7
6



DETAIL "A" TYPICAL FOR

XV-038, XV-039, XV-150, XV-151, XV-152, XV-155, XV-156, XV-157, XV-165
XV-251, XV-252, XV-255, XV-256, XV-257, XV-265

DETAIL "B" TYPICAL FOR

XV-082, XV-143, XV-144, XV-145, XV-146, XV-147, XV-148, XV-160A, XV-160B, XV- XV-164
XV-243, XV-244, XV-245, XV-246, XV-247, XV-248, XV-260A, XV-260B, XV-262, XV-264

DETAIL "C" TYPICAL FOR

FS-037, FS-041, FS-070, FS-071, FS-072, FS-073, FS-074, FS-075, FS-080, FS-136, FS-149
FS-150, FS-151, FS-152, FS-153, FS-154, FS-155, FS-156, FS-157, FS-158, FS-159,
FS-236, FS-249, FS-250, FS-251, FS-252, FS-253, FS-254, FS-255, FS-256, FS-257, FS-258,
FS-259

DETAIL "D" TYPICAL FOR

XV-161, XV-261

DETAIL "E" TYPICAL FOR

GATE VALVE NO	DRAIN VALVE NO	POSITION SWITCH NO	CARBON FILTER NO	FLOW SWITCH NO
1115 - 2115	1125 - 2125	ZS-180A, ZS-280A	1AF-179, 2AF-179	FS-75-130A, FS-75-230A
1116 - 2116	1126 - 2126	ZS-180B, ZS-280B	1BF-179, 2BF-179	FS-75-130B, FS-75-230B
1117 - 2117	1127 - 2127	ZS-181A, ZS-281A	1AF-257, 2AF-257	FS-76-143A, FS-76-243A
1118 - 2118	1128 - 2128	ZS-181B, ZS-281B	1BF-257, 2BF-257	FS-76-143B, FS-76-243B
1119 - 2119	1129 - 2129	ZS-182A, ZS-282A	1AF-261, 2AF-261	FS-76-192A, FS-76-292A
1120 - 2120	1130 - 2130	ZS-182B, ZS-282B	1BF-261, 2BF-261	FS-76-192B, FS-76-292B
0112	0119	ZS-076A	0AF-169	FS-76-013A
0113	0120	ZS-076B	0BF-169	FS-76-013B
0114	0121	Z[illegible]	0AF-161	FS-[illegible]-009A
0115	0122	ZS-077B	0[illegible]-161	FS-78-[illegible]
0116	0123	ZS-078A	[illegible]	FS-78-085A
0117	0124	ZS-078B	0B[illegible]-81	FS-78-085B
0118	0125	ZS-079	00F-[illegible]0	FS-79-070

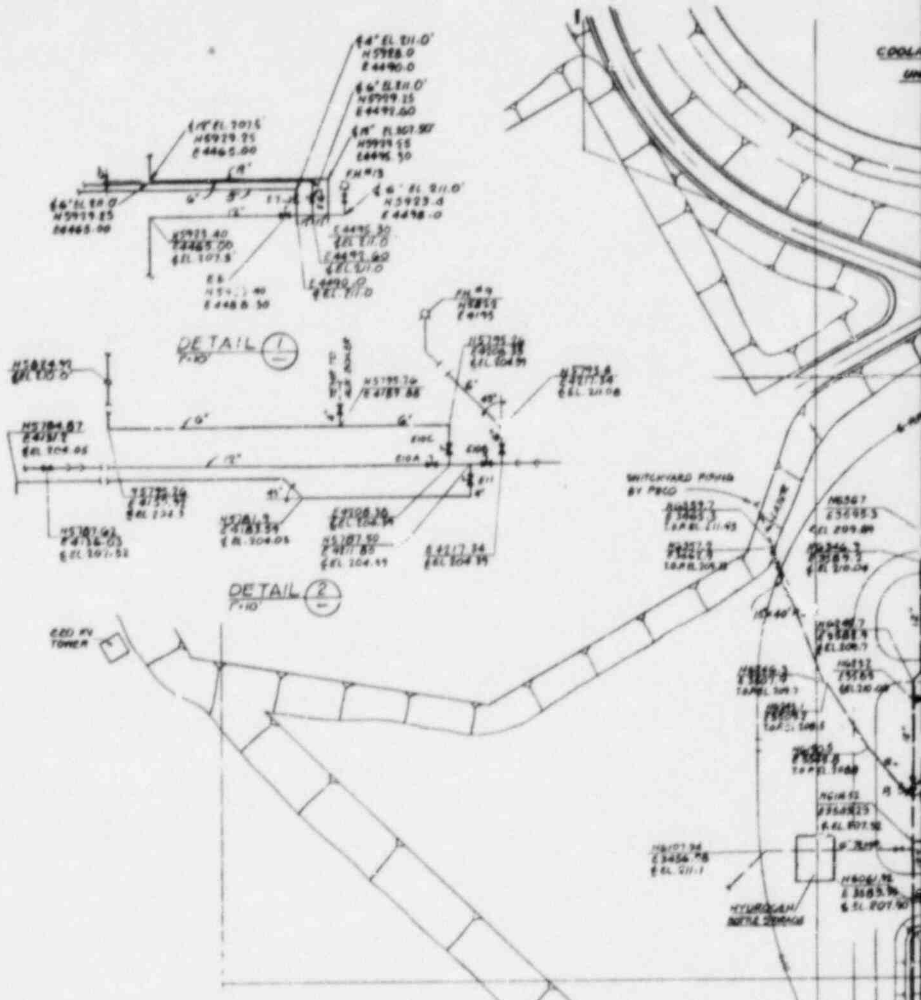
LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

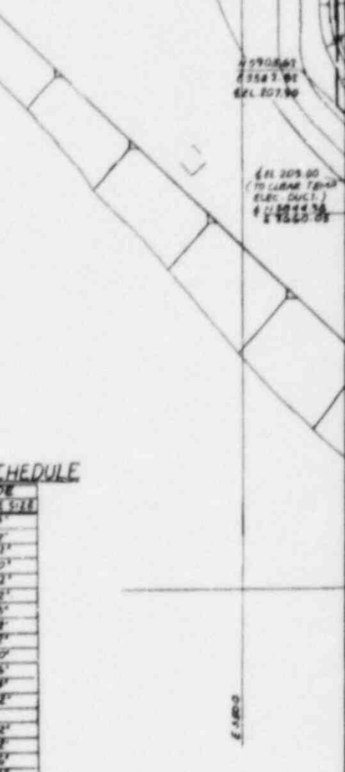
FIRE PROTECTION SYSTEM P&ID

FIGURE B-2

SHEET 2 OF 2

5 4 3 2 1





LEGEND

P.S. BITUMINOUS COATED CORRUGATED METAL PIPE SLEEVE, U.N.O.

GATE VALVE

POST INDICATOR VALVE (PIV)

FIRE HYDRANT WITH GATE VALVE

B.F. BLIND FLANGE

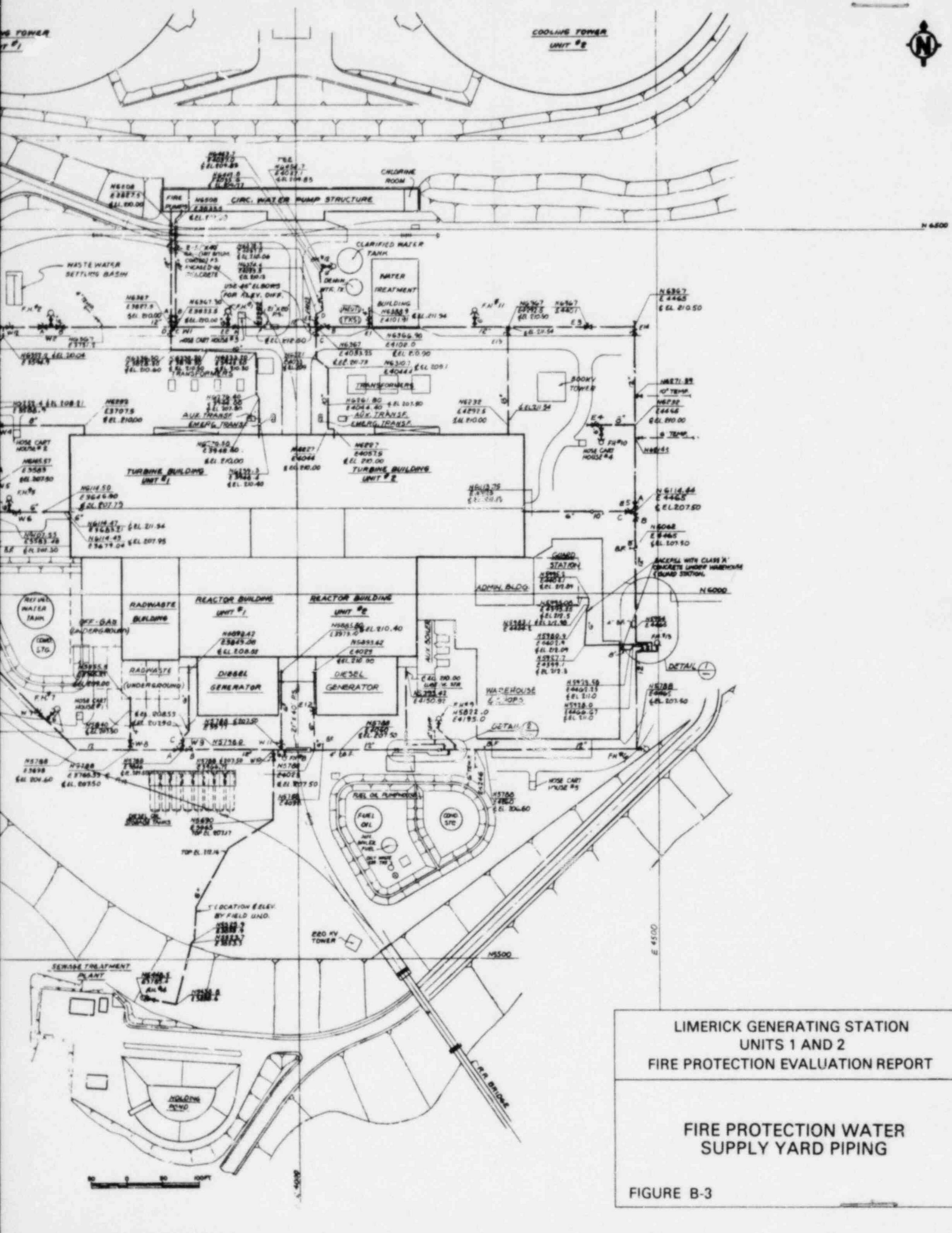
HOSE CART HOUSE

FIRE HYDRANT SCHEDULE

F.H. #	LOCATION F.H. TEE NORTH	LOCATION F.H. TEE EAST	LOCATION F.H.
1	6367	3905.2	15'N
2	6367	3660.9	16'N
3	LATER	LATER	LATER
5	6114.5	3602.73	74'E N
6	5788	4469	14'E
7	5836	4650	SEE PLAN
8	5788	4981	10'S
9	5781.5	4817.34	SEE PLAN
10	6232	4417	15'S
11	6807	4248	15'N
12	6454.7	4057.1	8'1E
13	5923.40	4495.30	2'10.5'N
14	SEE PLAN		

POST INDICATOR VALVE SCHEDULE

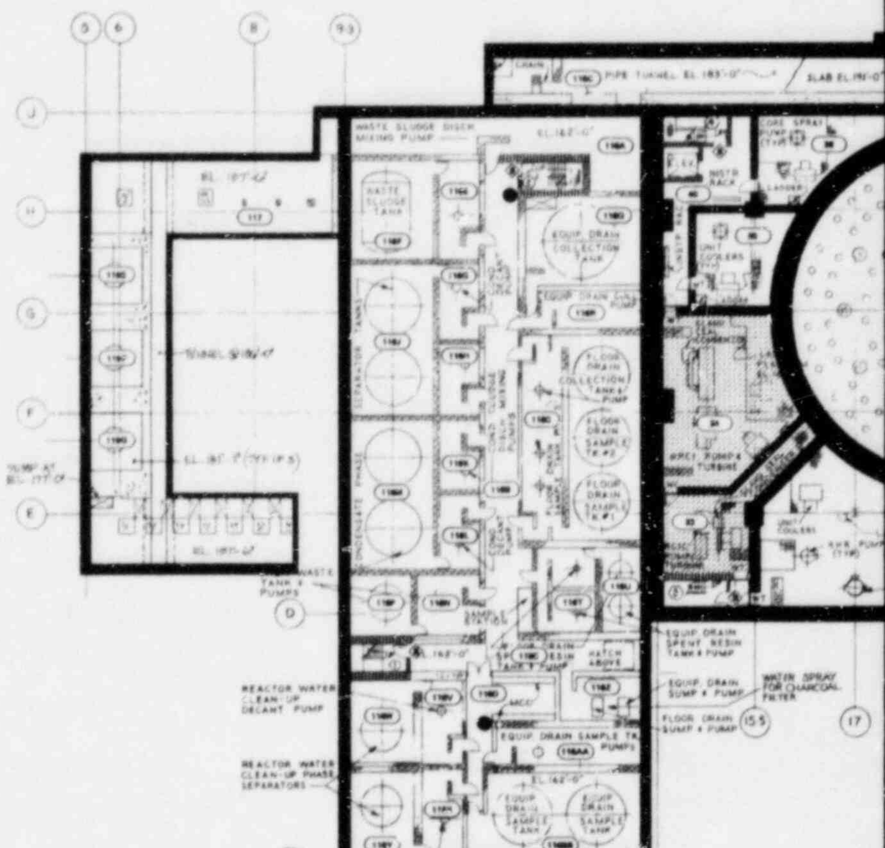
WEST SIDE PIV No.	WEST SIDE VALVE SIZE	EAST SIDE PIV No.	EAST SIDE VALVE SIZE
W1A, B&C	12"	E1	4"
W1D	10"	E2A	12"
W2A	12"	E2B	12"
W2B	12"	E2C	10"
		E2D	12"
		E3	12"
W4	8"	E4	8"
W5A	12"	E5A	12"
W5B	6"	E5B	12"
W6	6"	E5C	10"
W7	12"	E6	6"
W8	4"	E7	4"
W9A	12"	E8	12"
W9B	12"		
W9C	12"	E10A	12"
W10	6"	E10B	12"
W11	6"	E10C	6"
W13	12"	E11	4"
		E12	6"
		E13	6"
		E14	12"

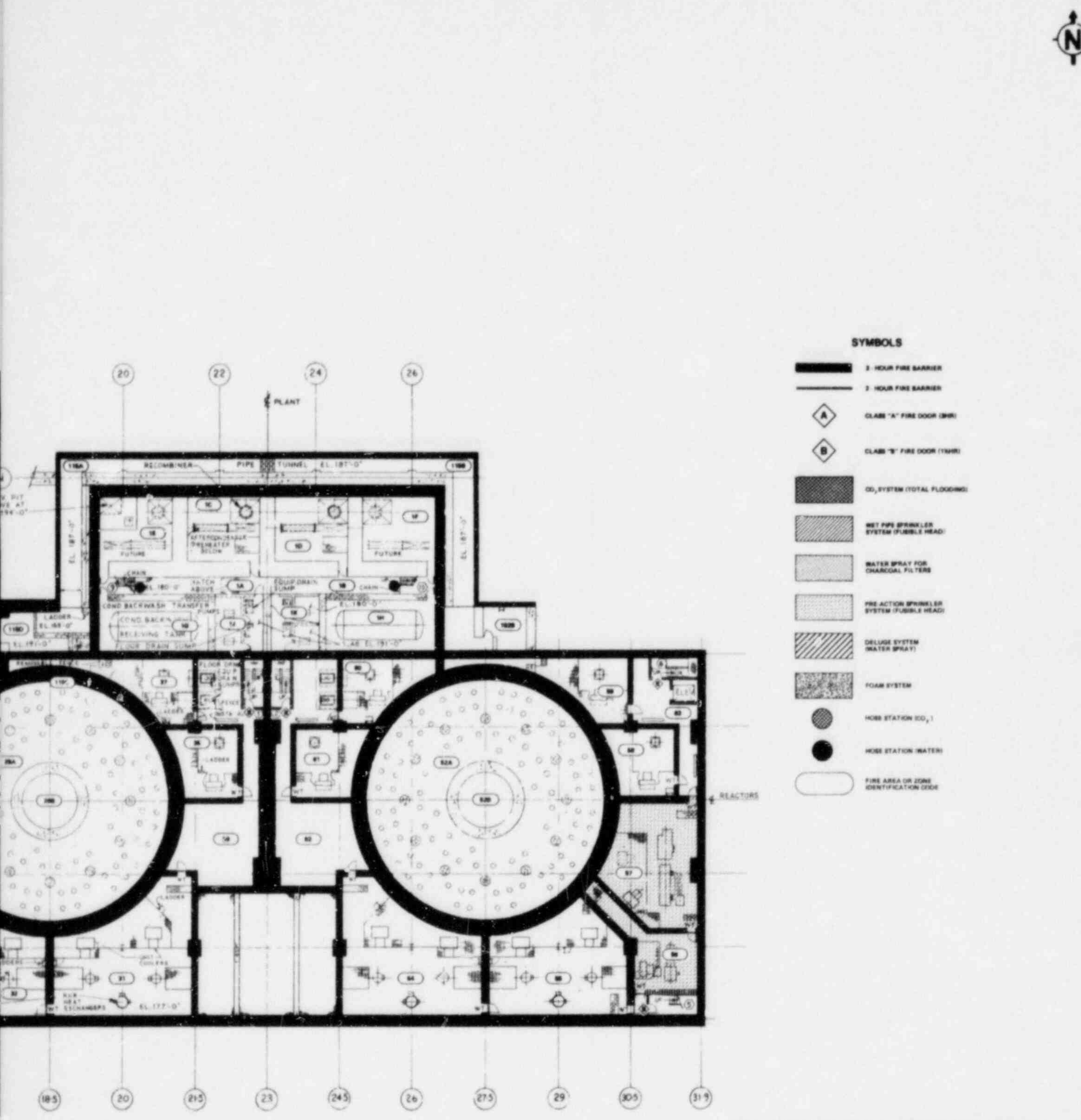


LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

FIRE PROTECTION WATER
SUPPLY YARD PIPING

FIGURE B-3


WASTE SLUDGE DISCH MIXING PUMP
EQUIP. DRAIN COLLECTION TANK
FLOOR DRAIN COLLECTION TANK & PUMP
FLOOR DRAIN SAMPLE TK #2
FLOOR DRAIN SAMPLE TK #1
WASTE TANK & PUMPS
SAMPLE STATION
HATCH ABOVE
EQUIP DRAIN SPENT RESIN TANK & PUMP
EQUIP. DRAIN SUMP & PUMP
WATER SPRAY FOR CHARCOAL FILTER
FLOOR DRAIN SUMP & PUMP
REACTOR WATER CLEAN-UP DECANT PUMP
EQUIP DRAIN SAMPLE TK PUMPS
REACTOR WATER CLEAN-UP PHASE SEPARATORS
EL. 162'-0"
EQUIP DRAIN SAMPLE TANK
EQUIP DRAIN SAMPLE TANK
REACTOR WATER CLEAN-UP SLUDGE DISCH MIXING PUMP
PIPE TUNNEL EL. 183'-0"
CORE SPRAY PUMP (TYP)
UNIT COOLERS
RHR PUMP (TYP)
J
H
G
F
E
D
A6
5
6
8
9.5
14.1
15.5
17



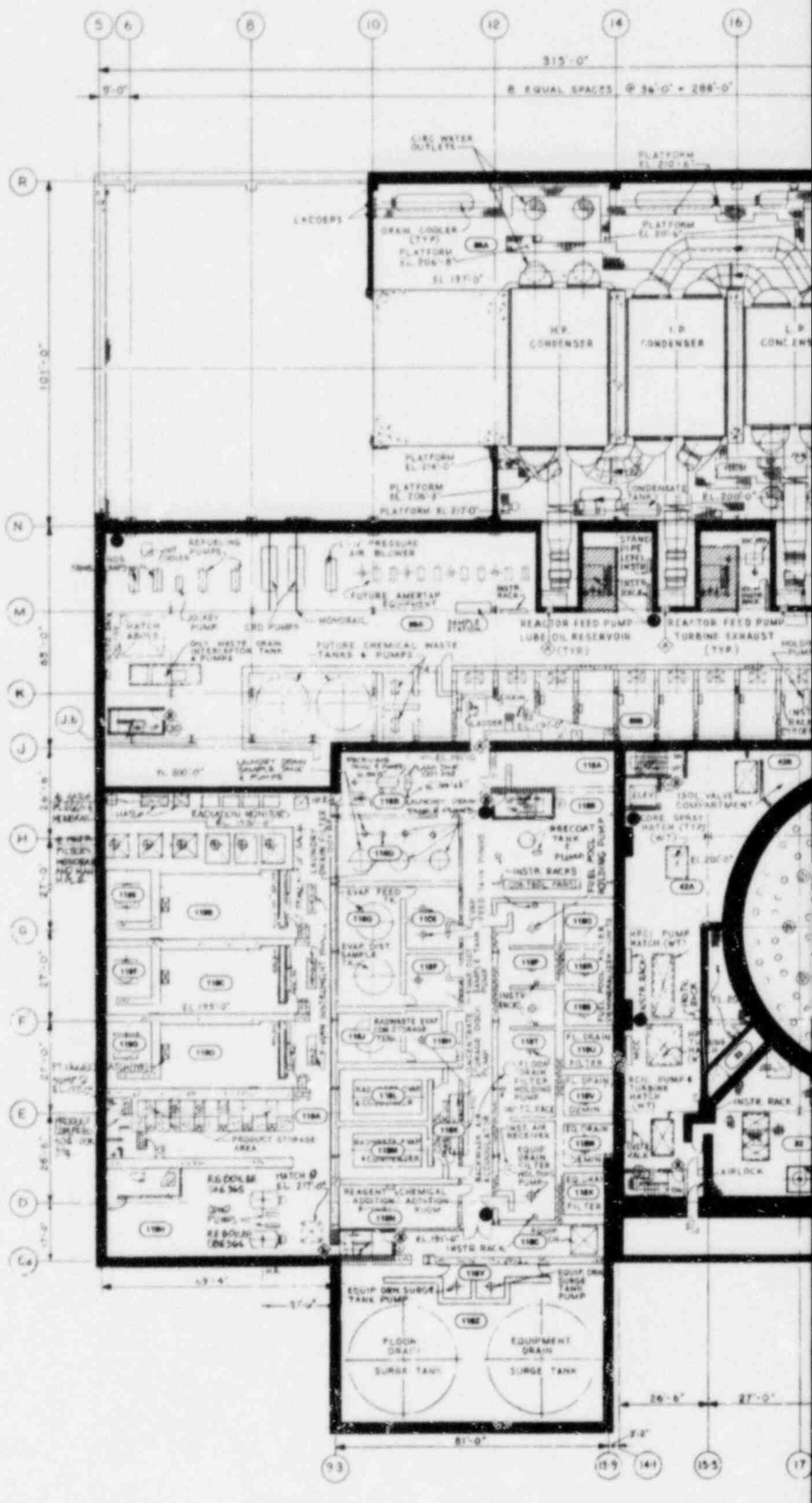
SYMBOLS

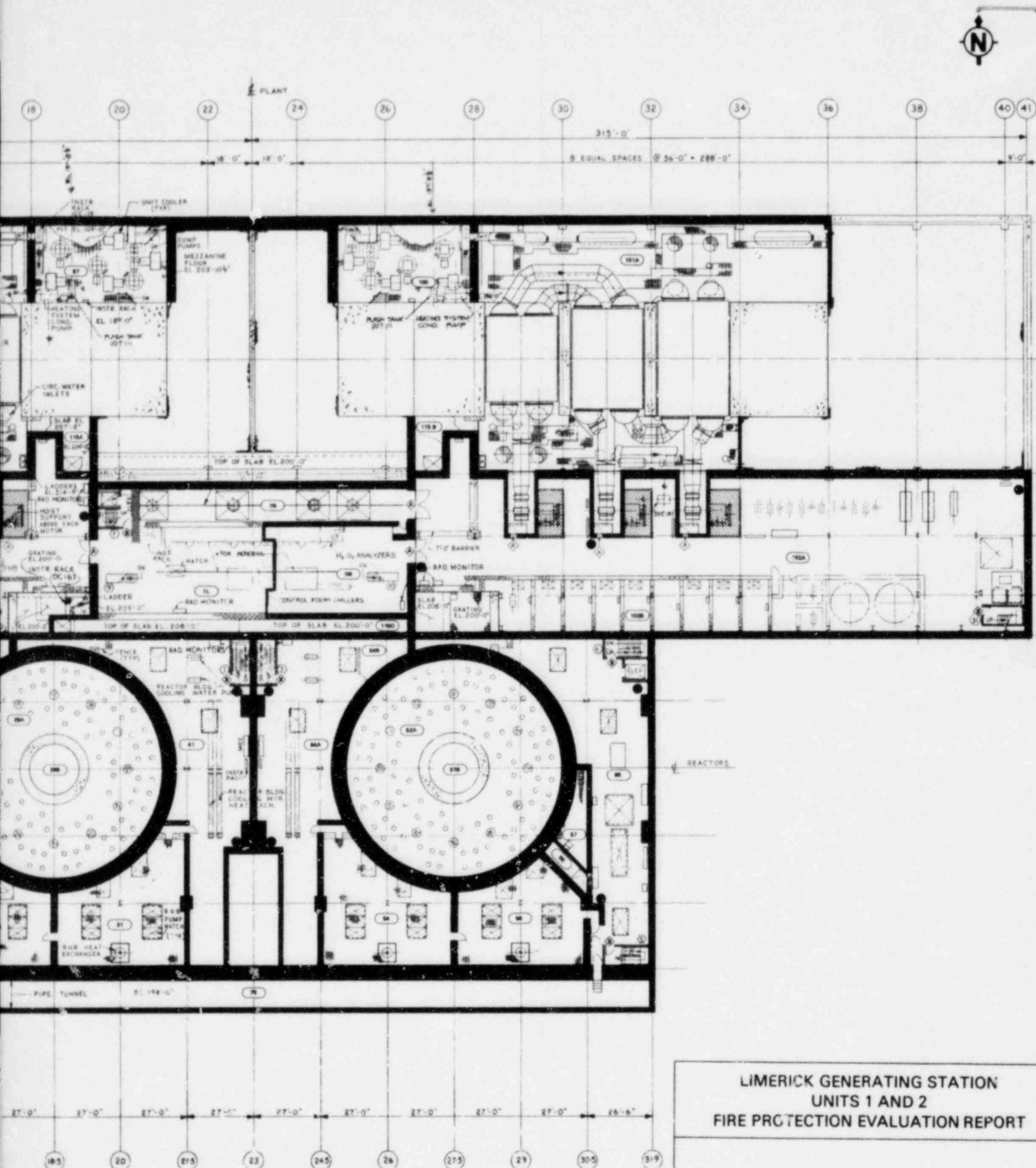
3 HOUR FIRE BARRIER
2 HOUR FIRE BARRIER
CLASS "A" FIRE DOOR (3HR)
CLASS "B" FIRE DOOR (1½HR)
CO_2 SYSTEM (TOTAL FLOODING)
WET PIPE SPRINKLER SYSTEM (FUSIBLE HEAD)
WATER SPRAY FOR CHARCOAL FILTERS
PRE-ACTION SPRINKLER SYSTEM (FUSIBLE HEAD)
DELUGE SYSTEM (WATER SPRAY)
FOAM SYSTEM
HOSE STATION (CO_2)
HOSE STATION (WATER)
FIRE AREA OR ZONE IDENTIFICATION CODE

LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

GENERAL FLOOR PLAN
EL. 162'-0", 177'-0", 180'-0"

FIGURE B-4

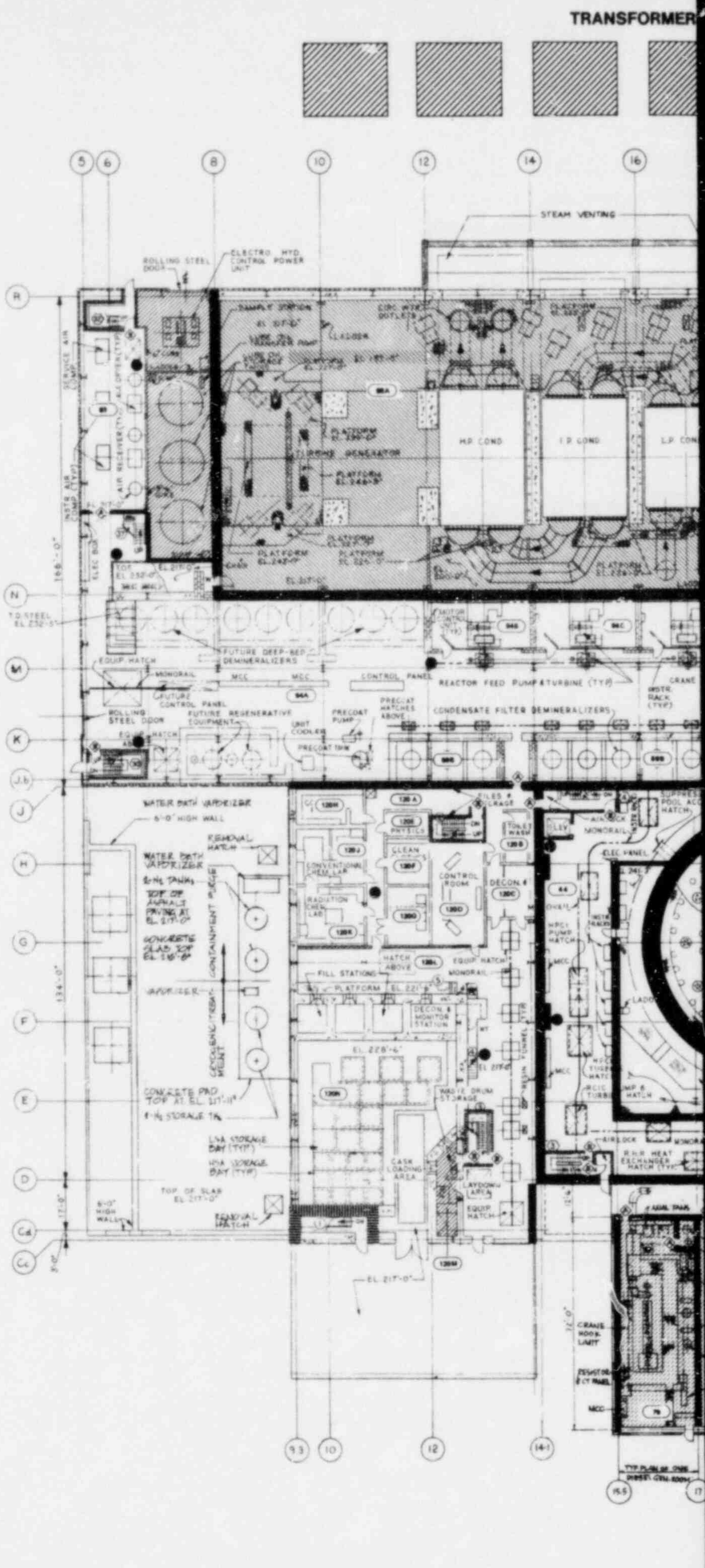

315'-0"
8 EQUAL SPACES @ 36'-0" = 288'-0"
CIRC WATER OUTLETS
LADDERS
H.P. CONDENSER
L.P. CONDENSER
REFUELING PUMPS
REACTOR FEED PUMP LUBE OIL RESERVOIR
REACTOR FEED PUMP TURBINE EXHAUST
RADIATION MONITORS
PRODUCT STORAGE AREA
INSTR. RACK
AIRLOCK
FLOOR DRAIN SURGE TANK
EQUIPMENT DRAIN SURGE TANK
81'-0"

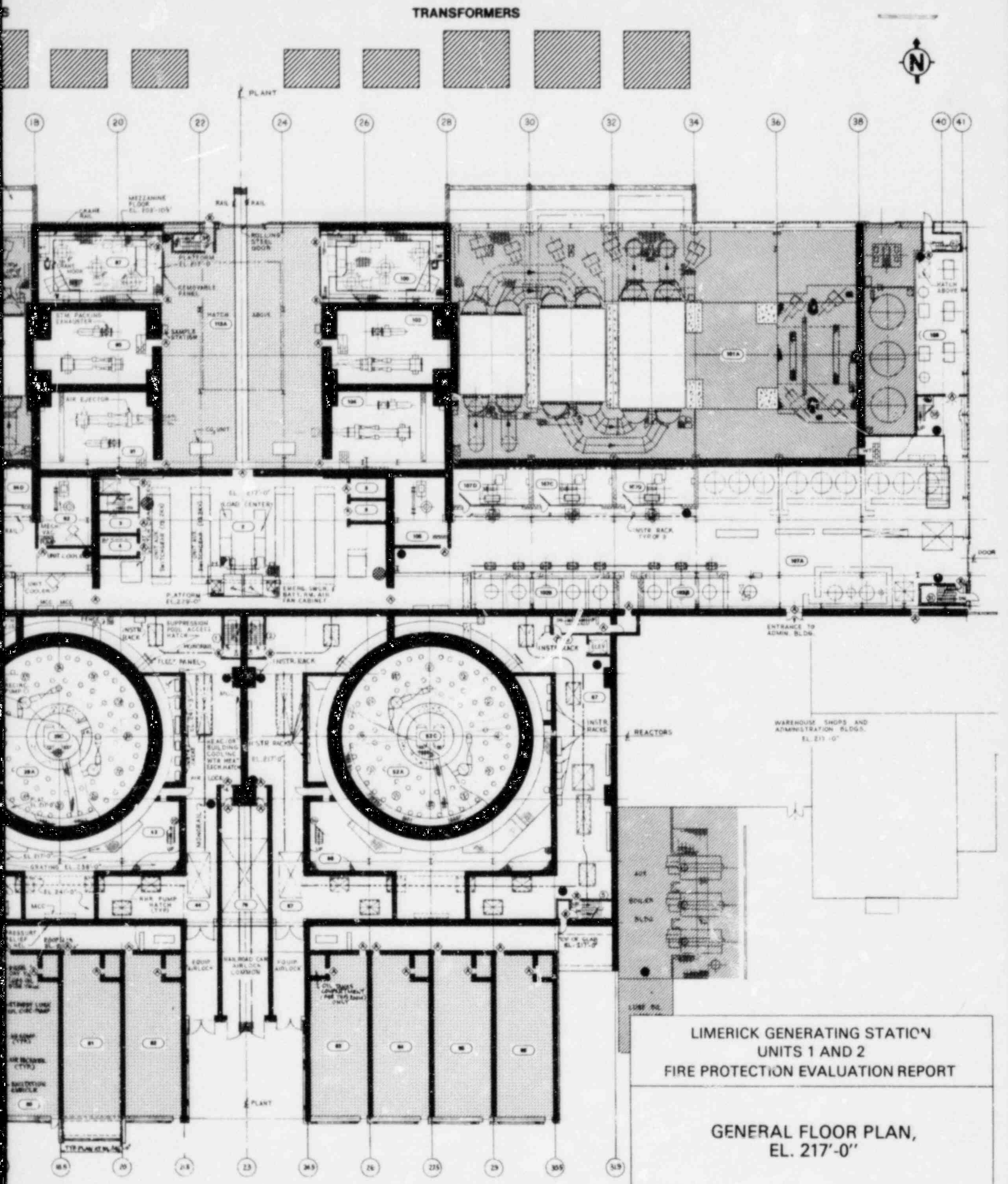


LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

GENERAL FLOOR PLAN,
EL. 191'-0", 195'-0", 200'-0",
201'-0"

FIGURE B-5

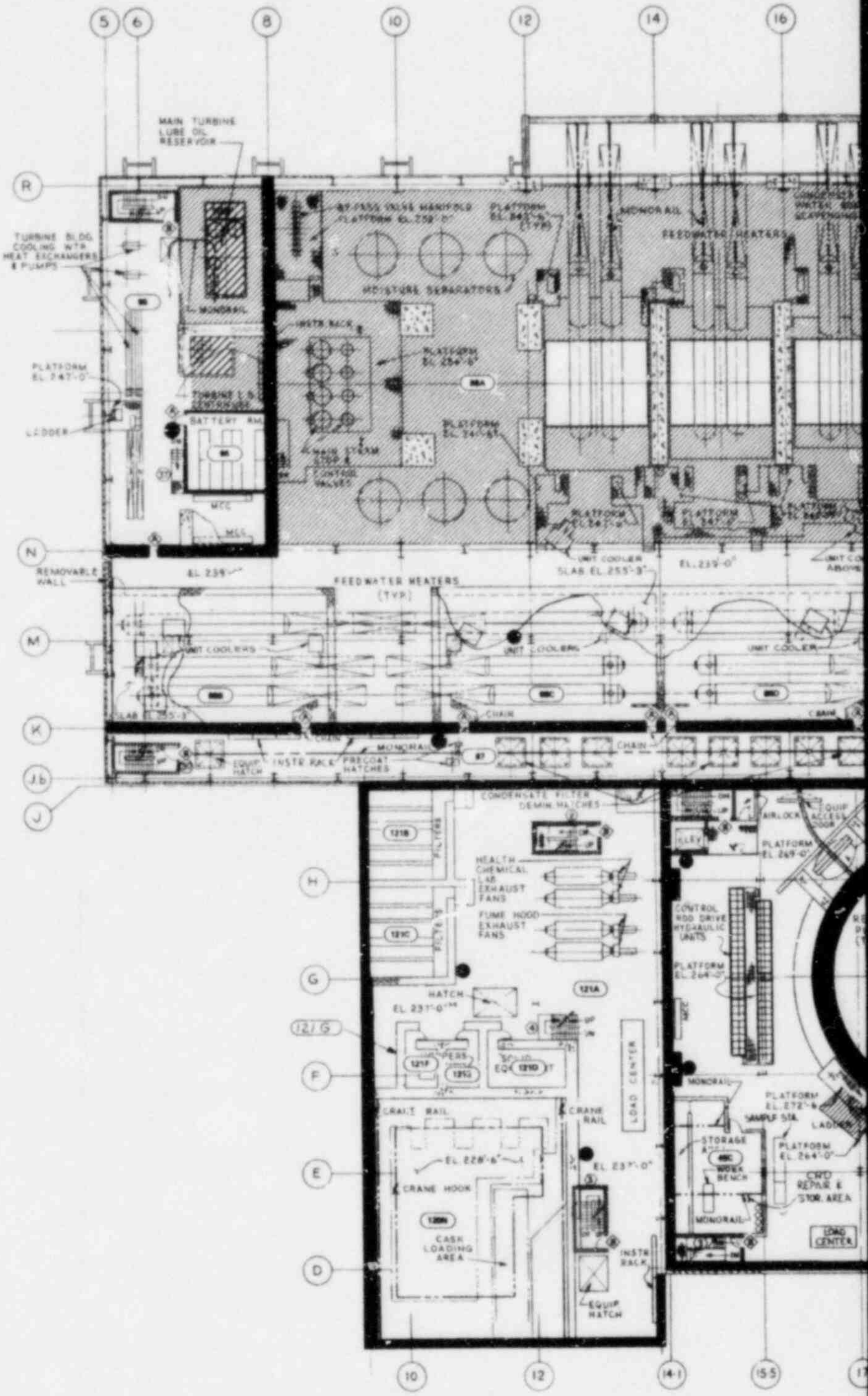

TRANSFORMER
STEAM VENTING
ROLLING STEEL DOOR
ELECTRO HYD. CONTROL POWER UNIT
H.P. COND
I.P. COND
TURBINE GENERATOR
FUTURE DEEP-BED DEMINERALIZERS
EQUIP. HATCH
MONORAIL
MCC
CONTROL PANEL
REACTOR FEED PUMP & TURBINE (TYP)
CONDENSATE FILTER DEMINERALIZERS
FUTURE REGENERATIVE EQUIPMENT
PRECOAT PUMP
PRECOAT HATCHES ABOVE
WATER BATH VAPORIZER
6'-0" HIGH WALL
REMOVAL HATCH
CONVENTIONAL CHEM. LAB
RADIATION CHEM. LAB
CONTROL ROOM
HEALTH PHYSICS
DECON.
FILL STATIONS
WASTE DRUM STORAGE
CASK LOADING AREA
LAYDOWN AREA
EQUIP. HATCH
TOP OF SLAB EL. 217'-0"
EL. 217'-0"
CRANE HOOK LIMIT
R.H.R. HEAT EXCHANGER HATCH (TYP)
AIR LOCK
MCC
166'-0"
134'-0"
17'-0"



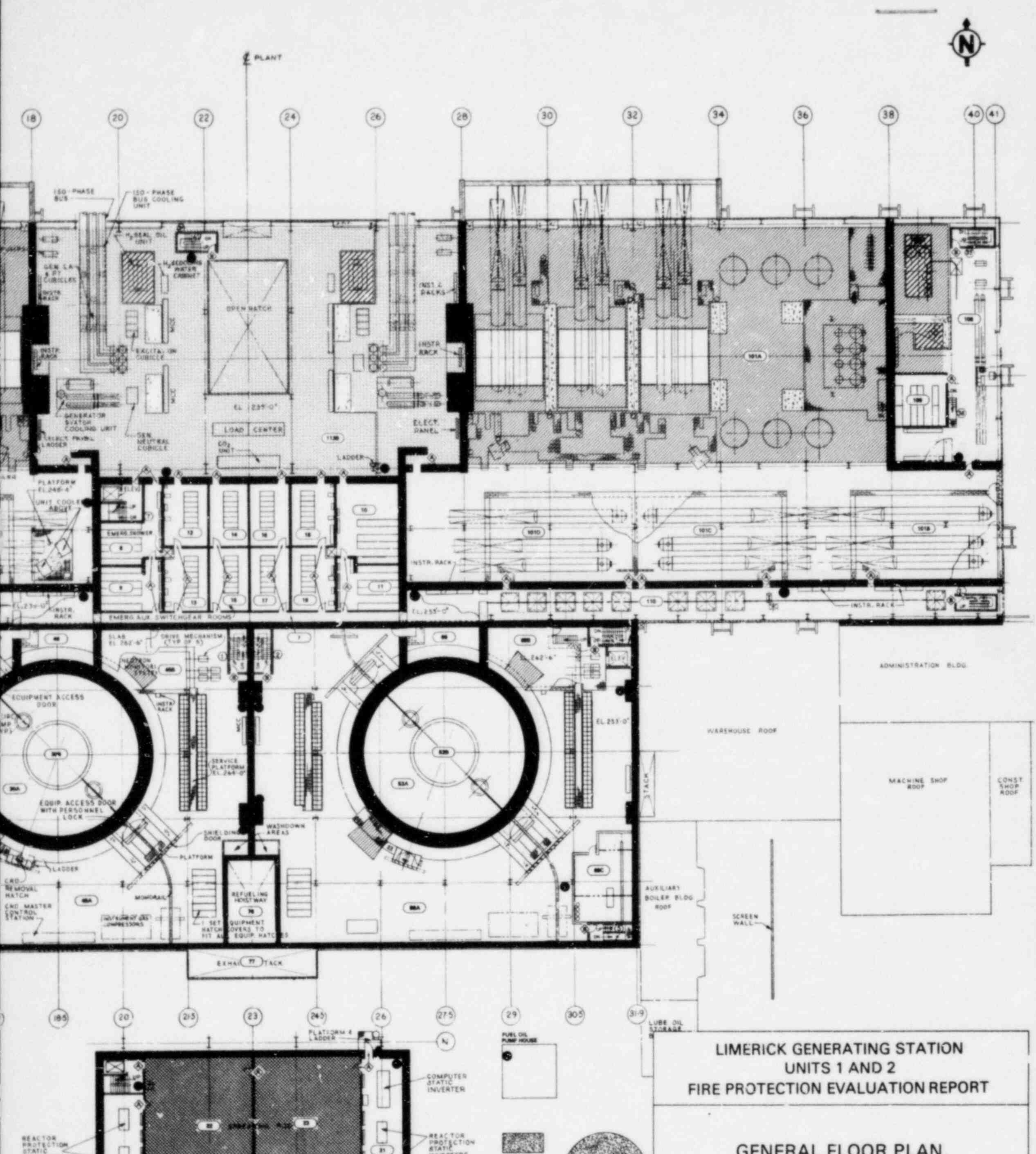
LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

GENERAL FLOOR PLAN,
EL. 217'-0"

FIGURE B-6



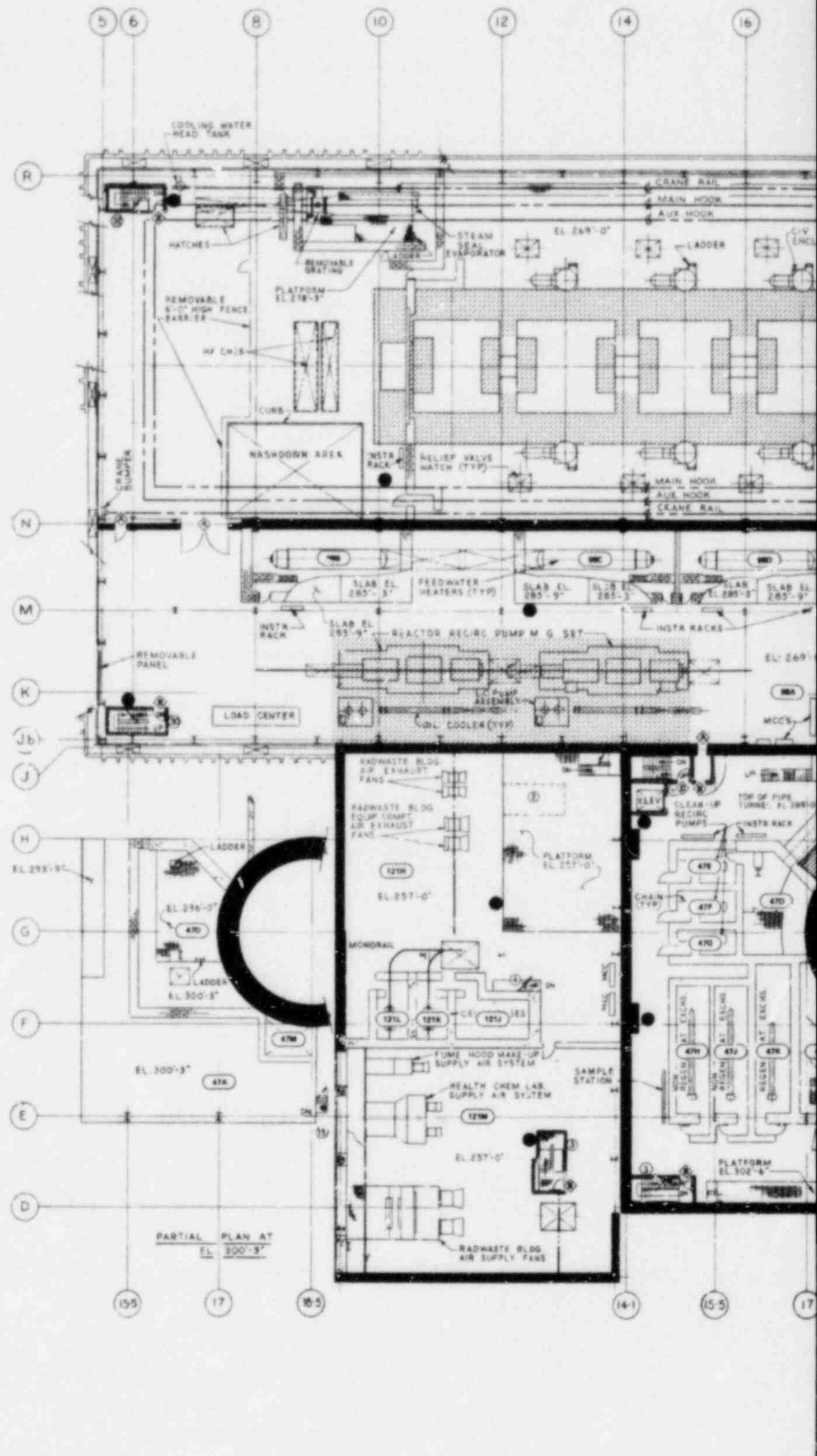
MAIN TURBINE LUBE OIL RESERVOIR
TURBINE BLDG COOLING WTR HEAT EXCHANGERS & PUMPS
PLATFORM EL. 247'-0"
LADDER
MONORAIL
BATTERY RM
MCC
MOISTURE SEPARATORS
FEEDWATER HEATERS
REMOVABLE WALL
FEEDWATER HEATERS (TYP)
UNIT COOLERS
UNIT COOLER
INSTR RACK
PRECOAT HATCHES
EQUIP HATCH
CHAIN
CONDENSATE FILTER DEMIN HATCHES
HEALTH CHEMICAL LAB EXHAUST FANS
FUME HOOD EXHAUST FANS
HATCH
LOAD CENTER
CRANE RAIL
CRANE HOOK
CASK LOADING AREA
EL. 228'-6"
EL. 237'-0"
CONTROL ROD DRIVE HYDRAULIC UNITS
PLATFORM EL. 264'-0"
AIRLOCK
SAMPLE STA.
STORAGE
WORK BENCH
CRD REPAIR & STOR. AREA
LOAD CENTER

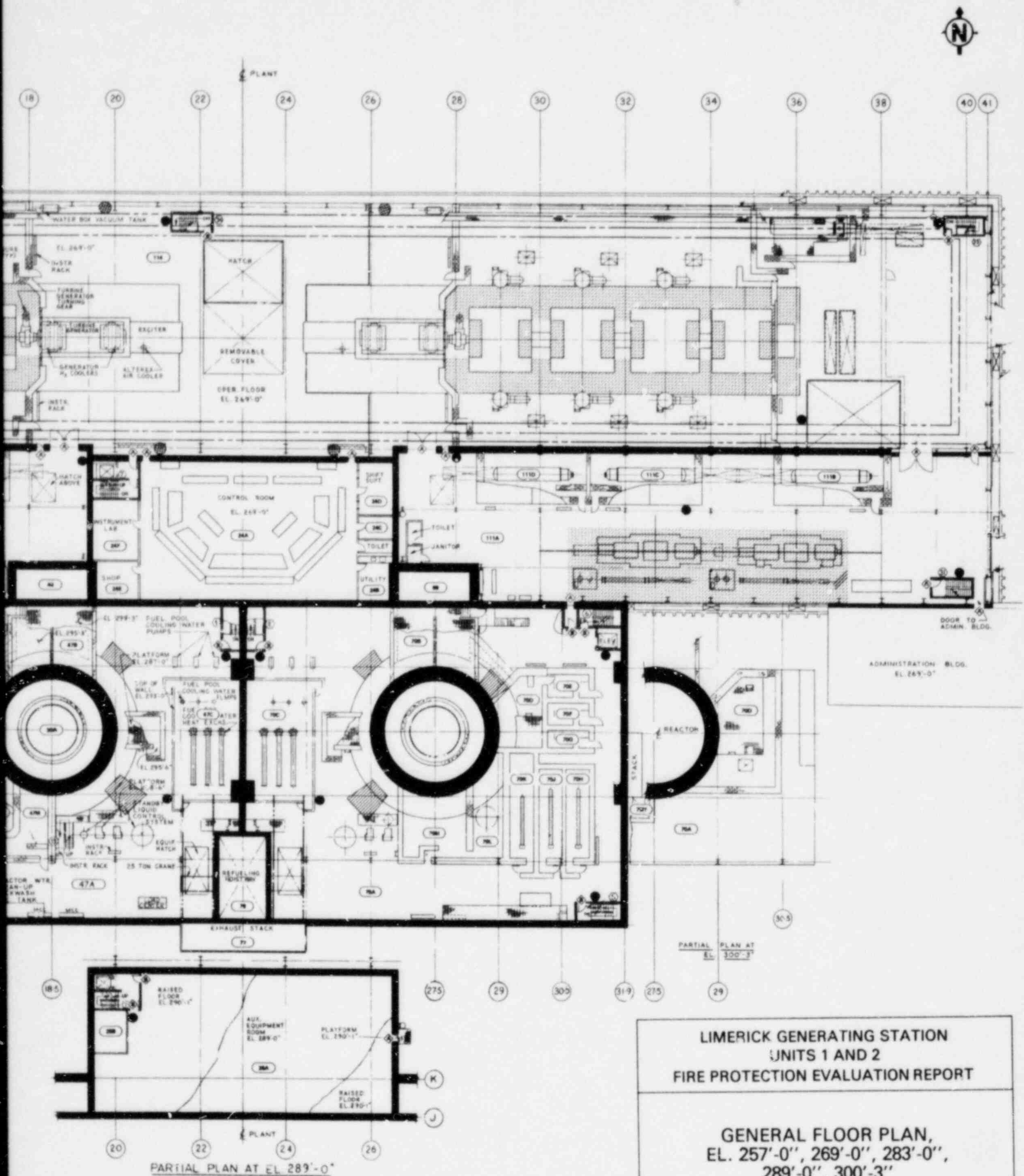


LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

GENERAL FLOOR PLAN,
EL. 237'-0'', 239'-0'', 253'-0'',
254'-0''

FIGURE B-7

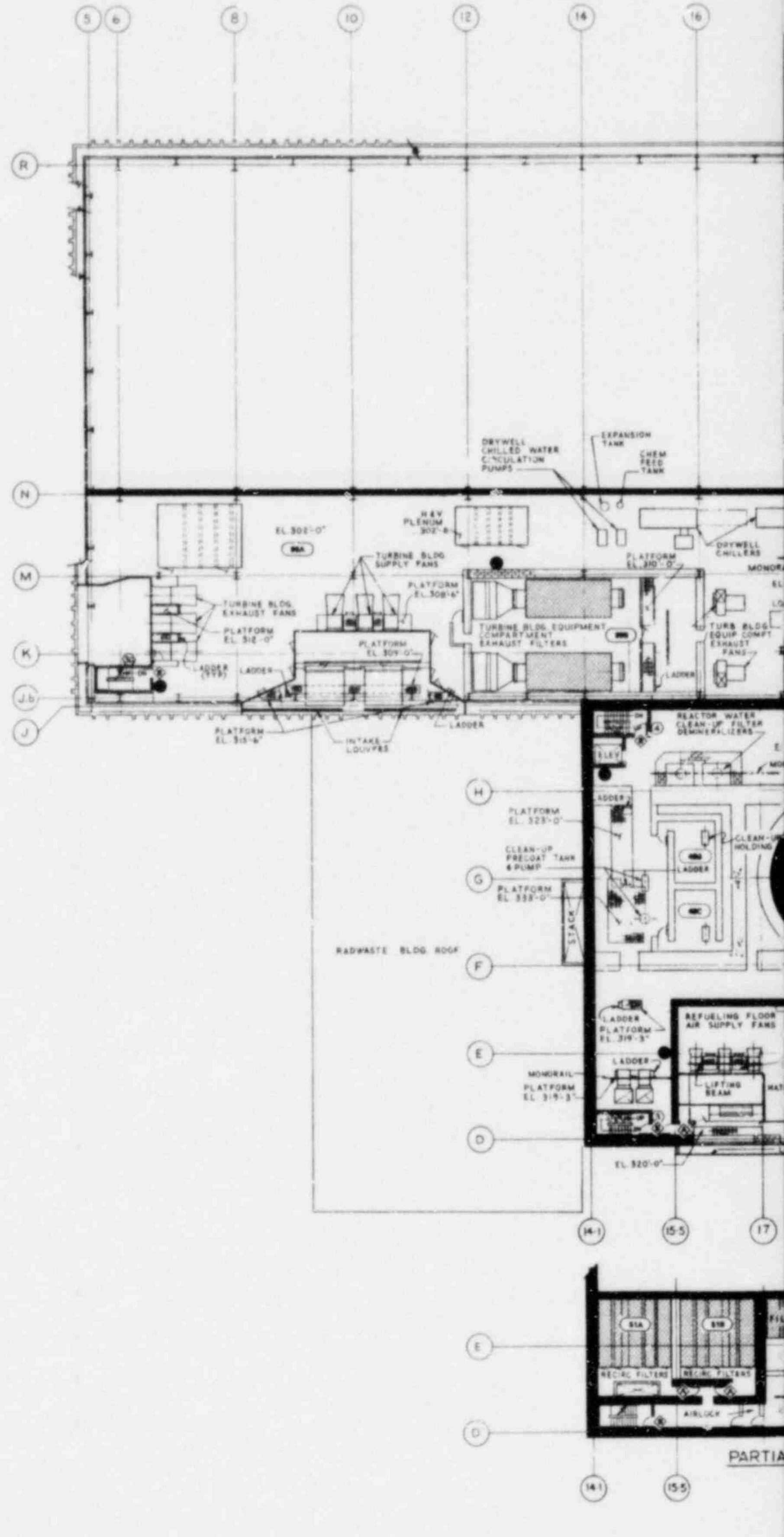

COOLING WATER HEAD TANK
HATCHES
REMOVABLE GRATING
PLATFORM EL.278'-3"
STEAM SEAL EVAPORATOR
EL. 269'-0"
LADDER
CRANE RAIL
MAIN HOOK
AUX HOOK
REMOVABLE 6'-0" HIGH FENCE BARRIER
CURB
WASHDOWN AREA
INSTR RACK
RELIEF VALVE HATCH (TYP)
CRANE BUMPER
FEEDWATER HEATERS (TYP)
INSTR RACKS
REACTOR RECIRC PUMP M G SET
REMOVABLE PANEL
LOAD CENTER
OIL COOLER (TYP)
RADWASTE BLDG AIR EXHAUST FANS
RADWASTE BLDG EQUIP COMPT AIR EXHAUST FANS
PLATFORM EL.257'-0"
EL.257'-0"
MONORAIL
FUME HOOD MAKE-UP SUPPLY AIR SYSTEM
HEALTH CHEM LAB SUPPLY AIR SYSTEM
SAMPLE STATION
RADWASTE BLDG AIR SUPPLY FANS
CLEAN-UP RECIRC PUMPS
EL.300'-3"
PARTIAL PLAN AT EL 300'-3"



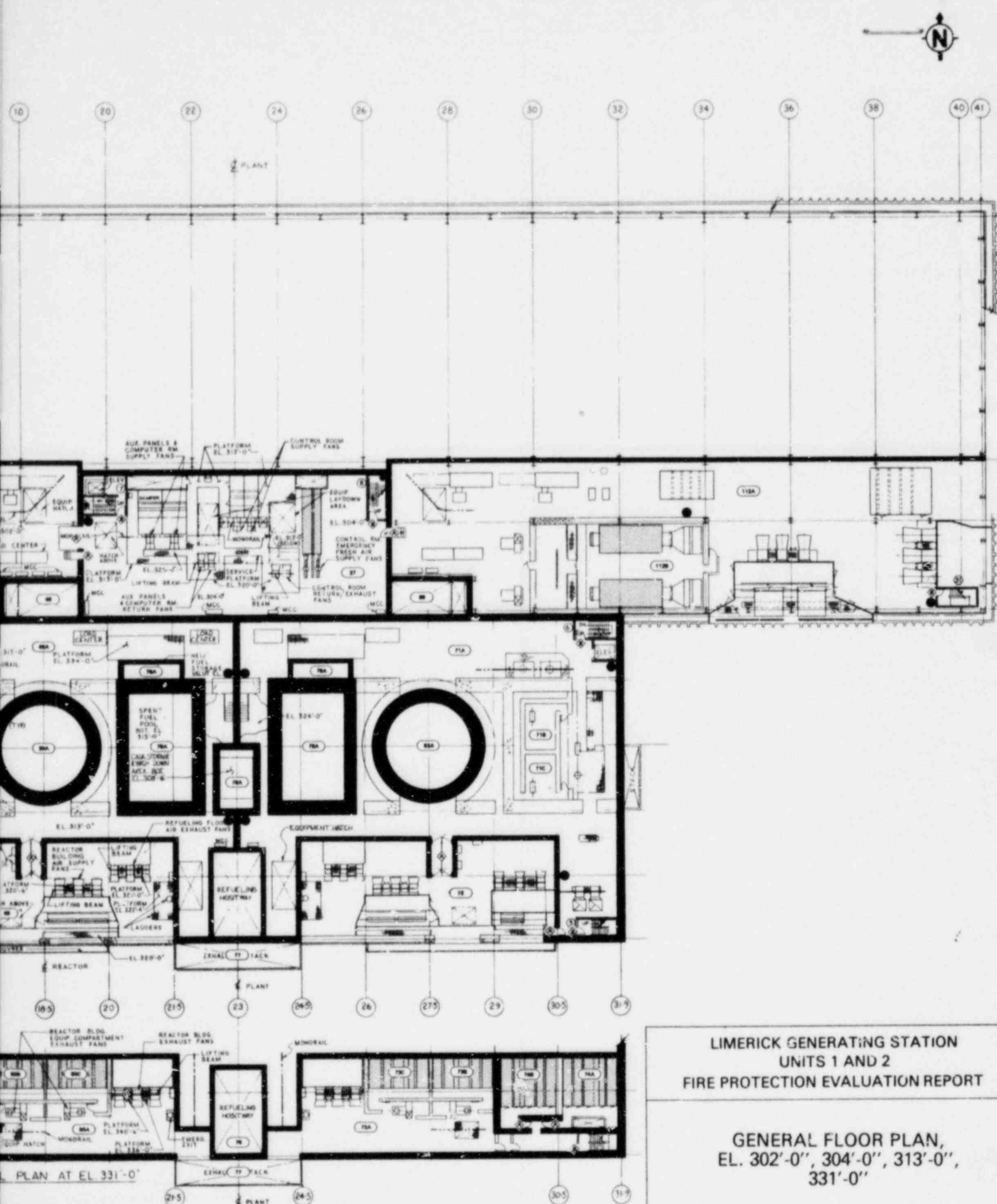
LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

GENERAL FLOOR PLAN,
EL. 257'-0", 269'-0", 283'-0", 289'-0", 300'-3"

FIGURE B-8



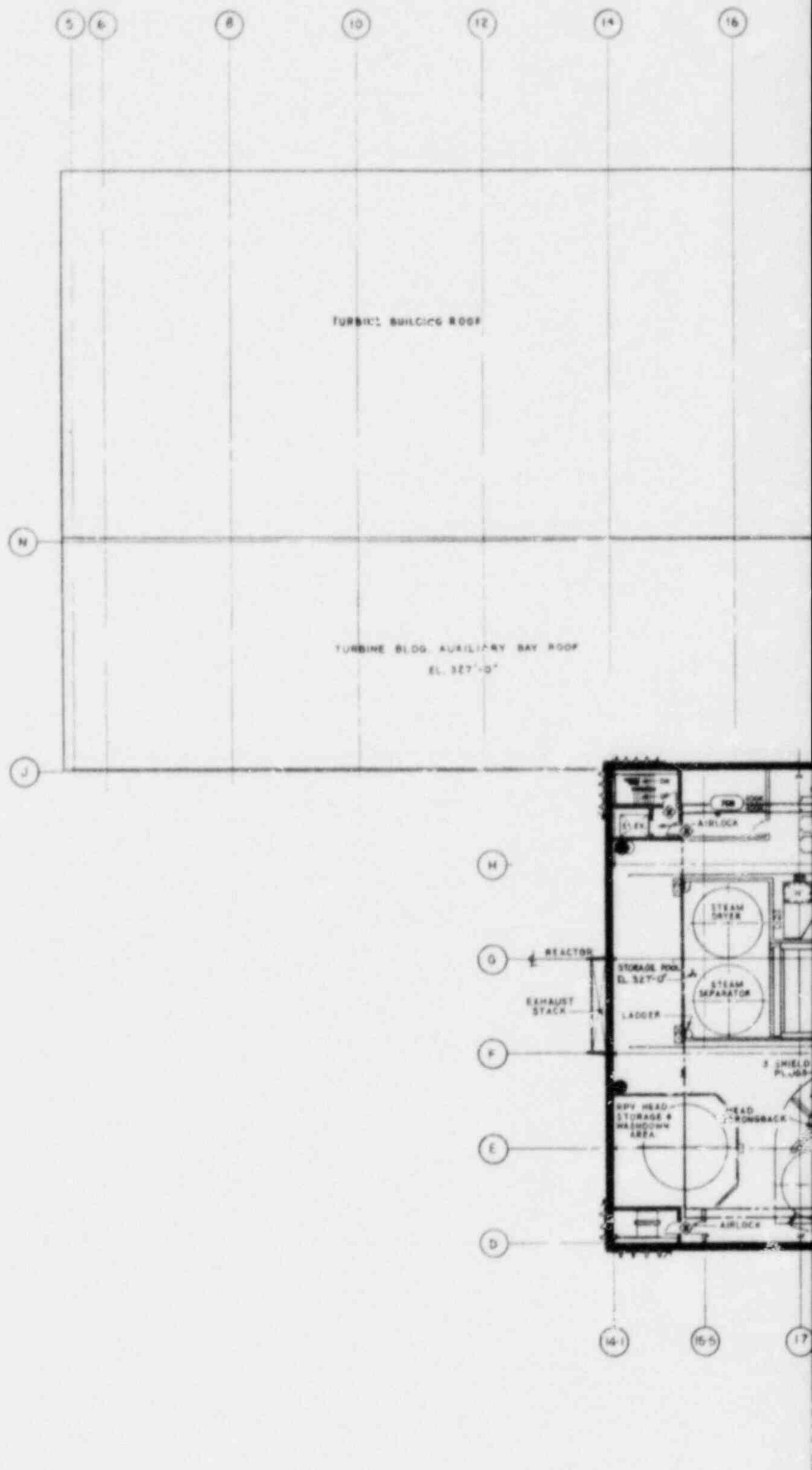
DRYWELL CHILLED WATER CIRCULATION PUMPS
EXPANSION TANK
CHEM FEED TANK
EL. 302'-0"
TURBINE BLDG SUPPLY FANS
TURBINE BLDG EXHAUST FANS
PLATFORM EL. 312'-0"
PLATFORM EL. 309'-0"
LADDER
PLATFORM EL. 315'-6"
INTAKE LOUVRES
TURBINE BLDG EQUIPMENT COMPARTMENT EXHAUST FILTERS
DRYWELL CHILLERS
TURB BLDG EQUIP COMPT EXHAUST FANS
REACTOR WATER CLEAN-UP FILTER DEMINERALIZERS
ELEV
PLATFORM EL. 323'-0"
CLEAN-UP PRECOAT TANK & PUMP
STACK
RADWASTE BLDG ROOF
REFUELING FLOOR AIR SUPPLY FANS
MONORAIL
LIFTING BEAM
EL. 320'-0"
RECIRC FILTERS
AIRLOCK
PARTIA



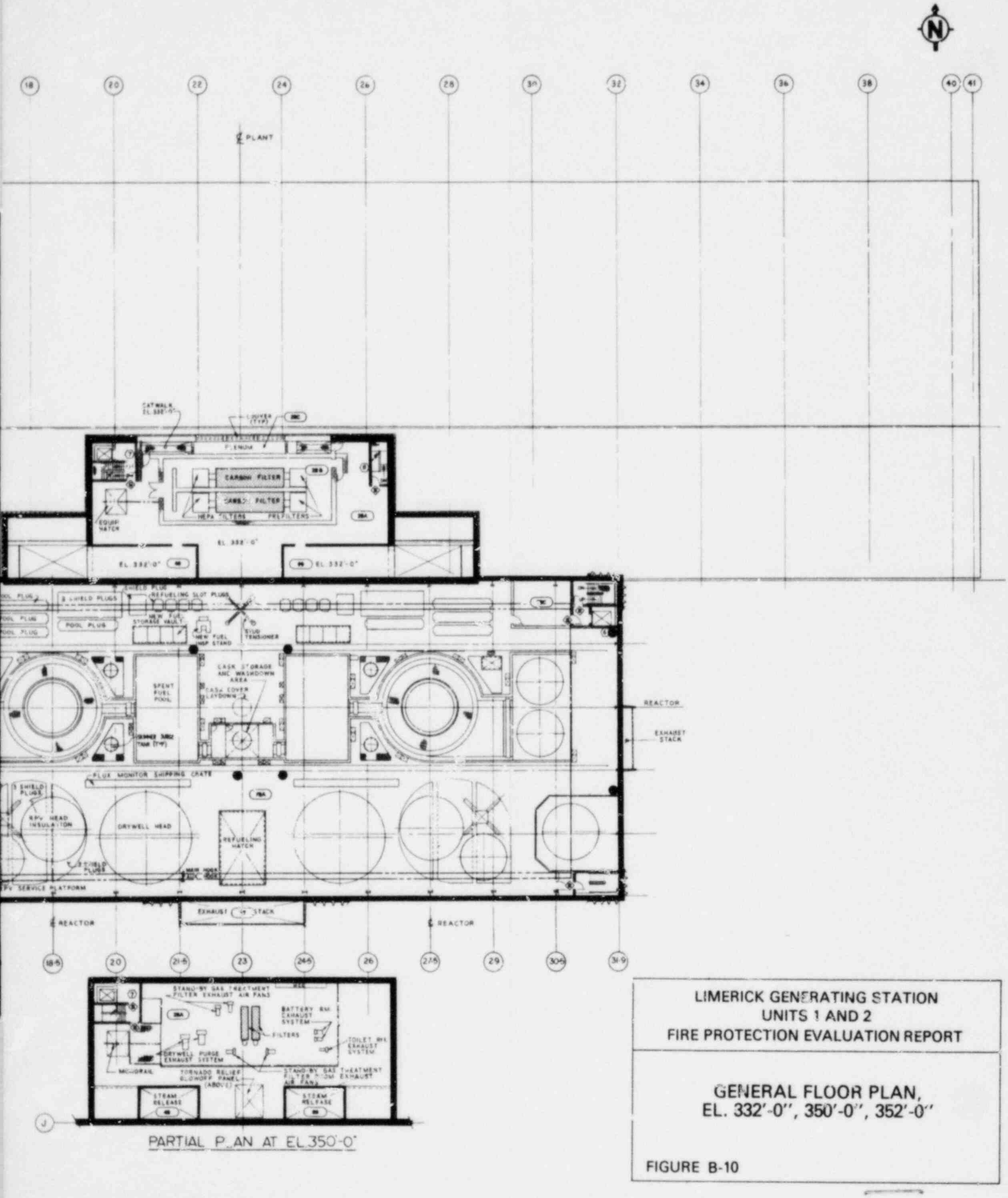
LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

GENERAL FLOOR PLAN,
EL. 302'-0", 304'-0", 313'-0",
331'-0"

FIGURE B-9



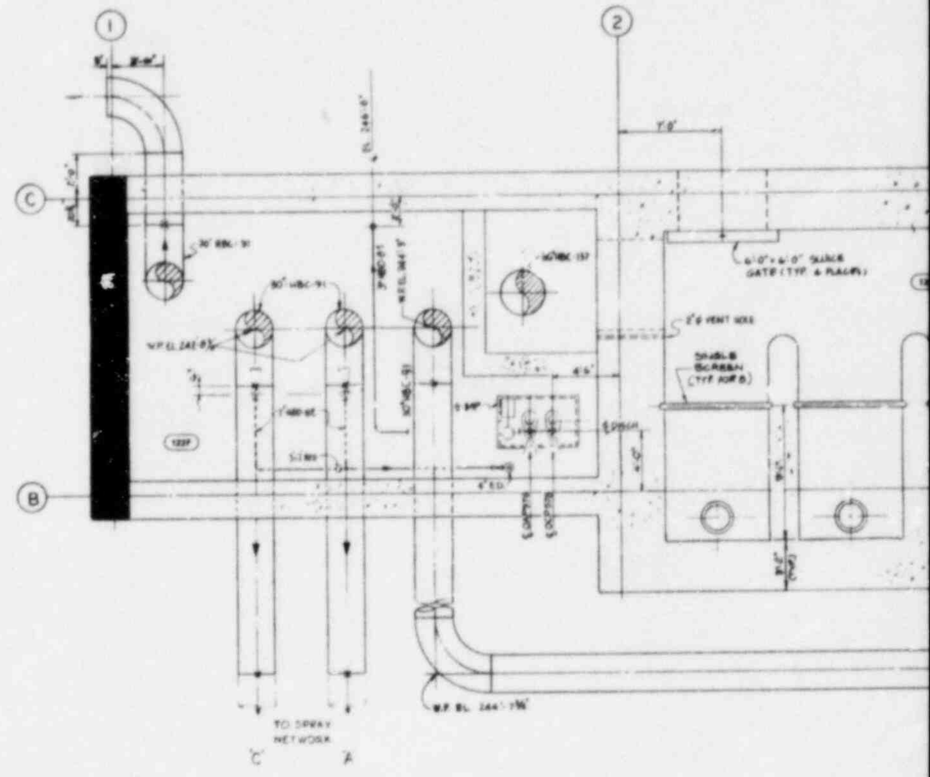
5
6
8
10
12
14
16
TURBINE BUILDING ROOF
N
TURBINE BLDG. AUXILIARY BAY ROOF
EL. 327'-0"
J
H
G
REACTOR
EXHAUST STACK
F
E
D
AIRLOCK
STEAM DRYER
STORAGE POOL EL. 327'-0"
STEAM SEPARATOR
LADDER
RPV HEAD STORAGE & WASHDOWN AREA
AIRLOCK
14·1
15·5
17

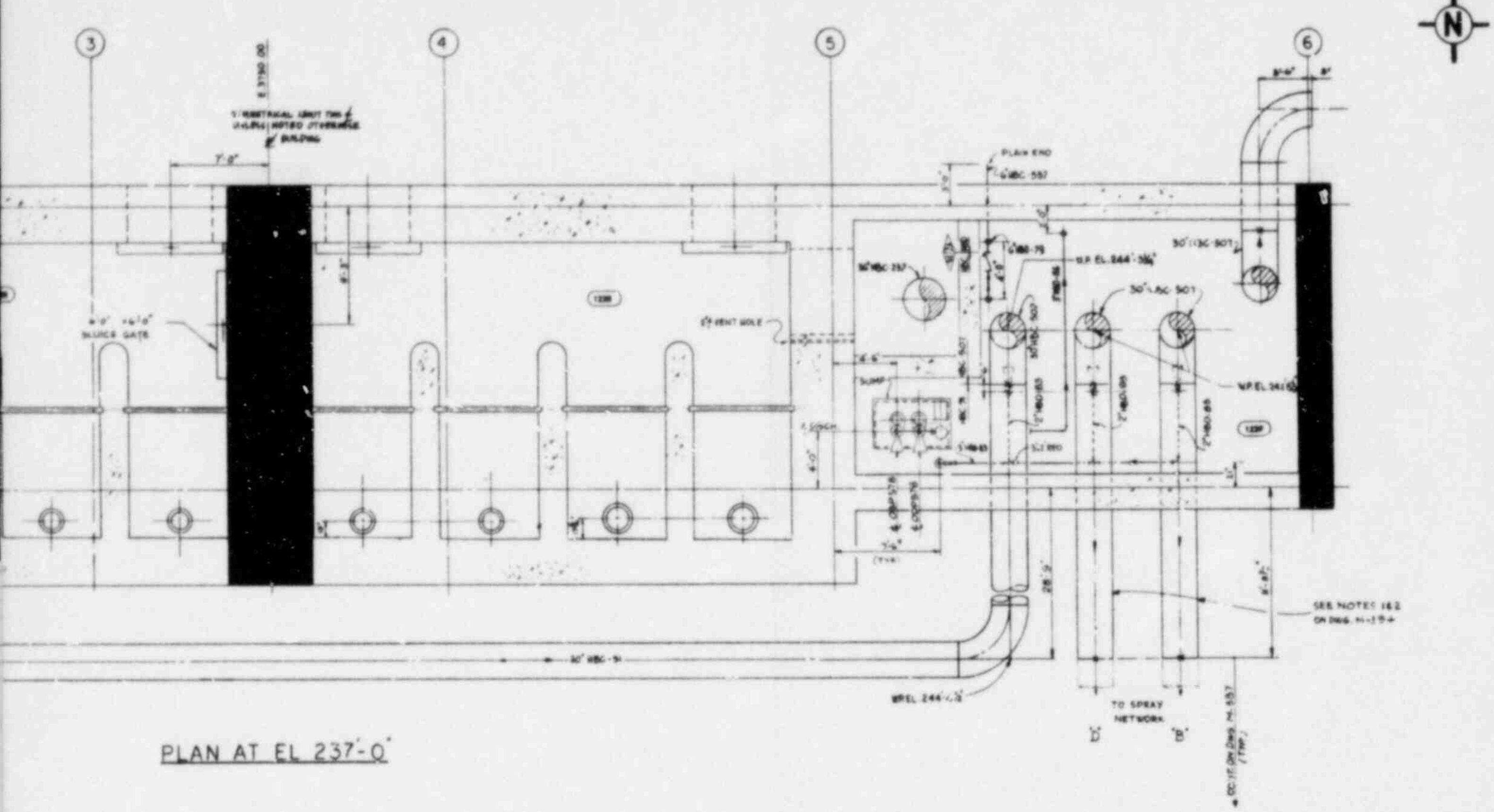


LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

GENERAL FLOOR PLAN,
EL. 332'-0", 350'-0", 352'-0"

FIGURE B-10


1
2
C
B
TO SPRAY
NETWORK
'C'
'A'

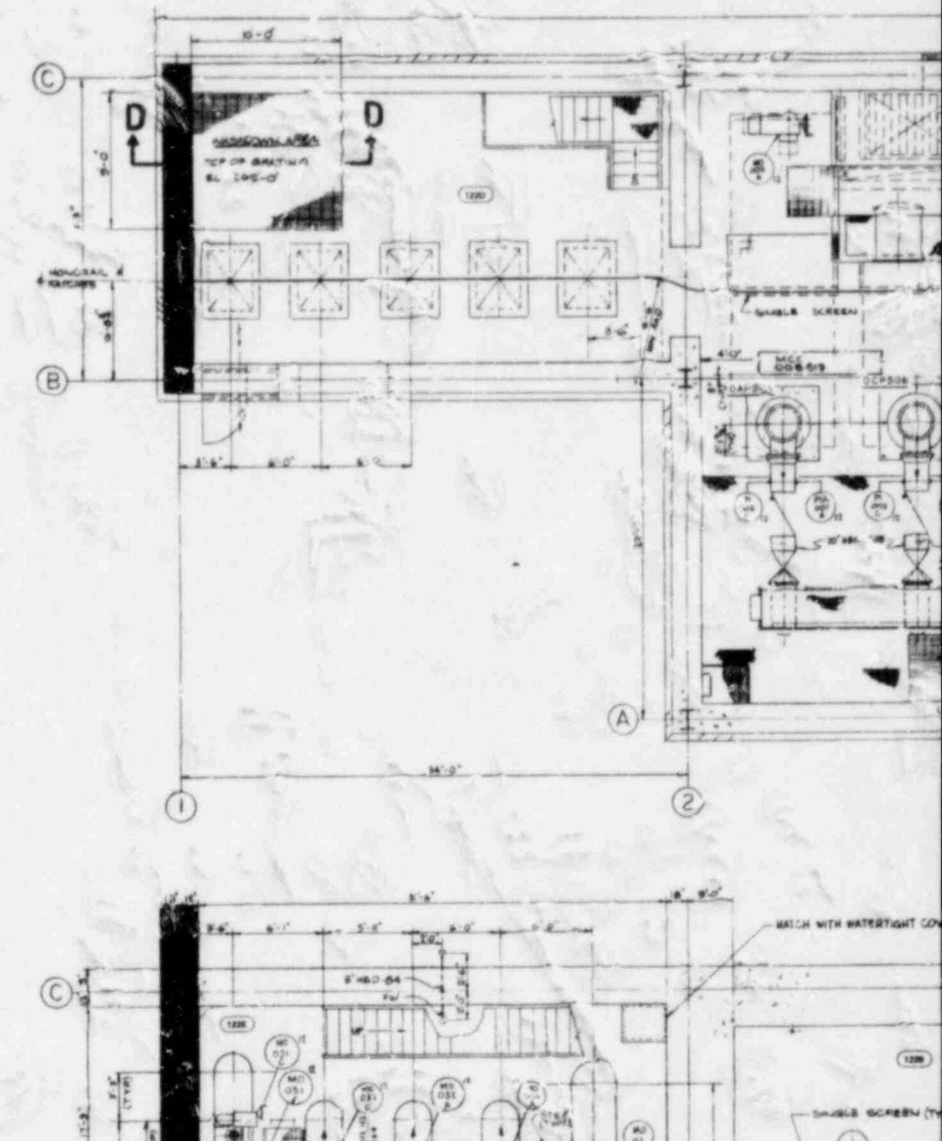


PLAN AT EL 237'-0"

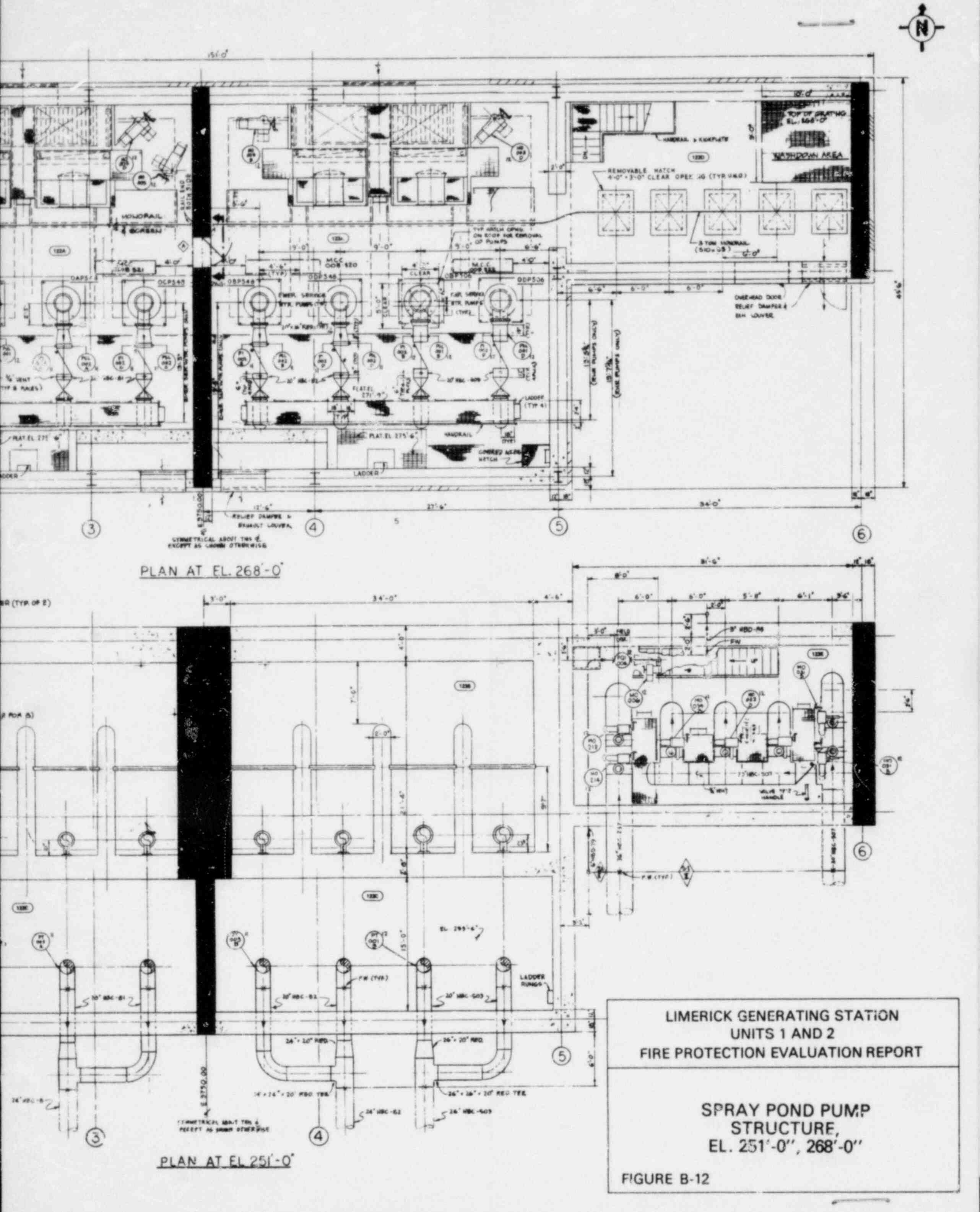
LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

SPRAY POND PUMP STRUCTURE, EL. 237'-0"

FIGURE B-11



D
D
SINGLE SCREEN
MCC
HATCH WITH WATERTIGHT COVER
SINGLE SCREEN (TYP)
VALVE TEST HANDLE
GRATING
DRAIN
3 HR. FD
SECTION D-D
SECTION E-E



LIMERICK GENERATING STATION
UNITS 1 AND 2
FIRE PROTECTION EVALUATION REPORT

SPRAY POND PUMP STRUCTURE, EL. 251'-0", 268'-0"

FIGURE B-12