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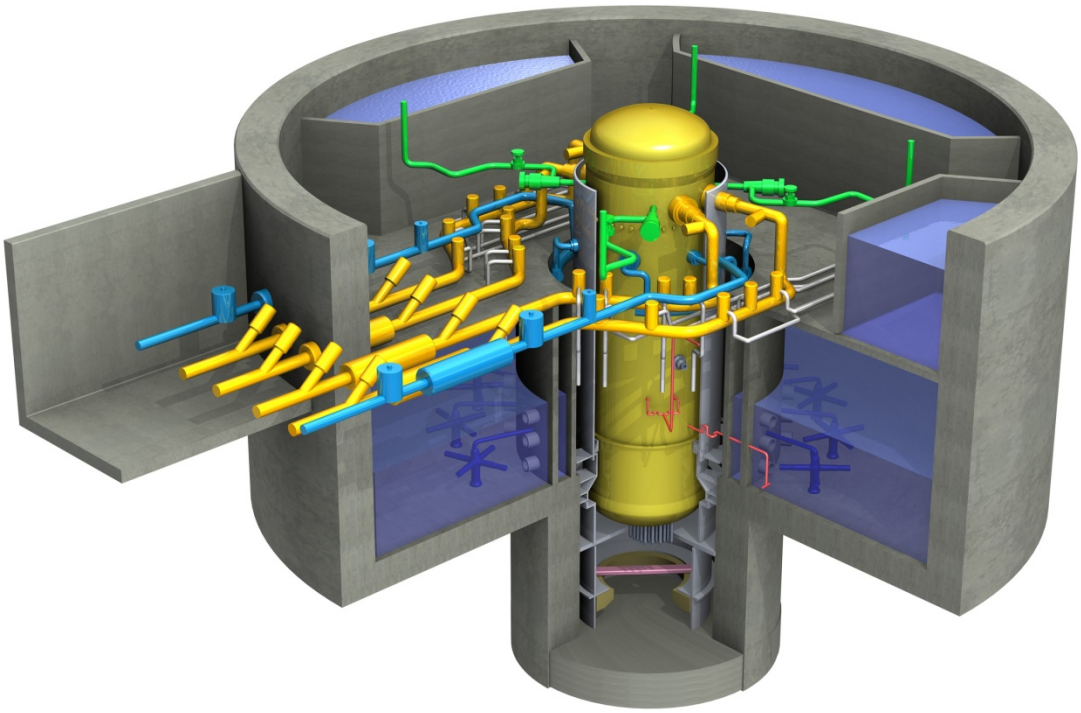

ESBWR Design Control Document
Tier 2

Chapter 9
Auxiliary Systems
Appendix 9A

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9A. FIRE HAZARDS ANALYSIS

9A.1 INTRODUCTION

This fire hazards analysis (FHA) establishes and evaluates distinct fire areas for the Reactor Building, Fuel Building, Control Building, Turbine Building, Radwaste Building, Electrical Building, Yard, Pump House, Guard House, Hot Machine Shop, Service Water/Water Treatment Building, Cold Machine Shop, Warehouse, Training Center, Service Building, Auxiliary Boiler Building, Fire Pump Enclosure, Ancillary Diesel Building and Administration Building. Plan and elevation view drawings of the buildings are utilized to depict the resulting fire area boundaries, fire barriers, and fire suppression systems. Fire areas containing safe shutdown equipment are identified and evaluated to confirm that a sufficient number of safe shutdown systems remain available during and following a design basis fire to achieve hot shutdown and maintain safe shutdown.

All materials capable of supporting combustion in each of the designated fire areas are identified and quantified in Tables 9A.5-1 through 9A.5-7. In addition, the fire protection features available for each room or fire area are identified in Tables 9A.5-1 through 9A.5-7.

The primary requirement of a nuclear facility is to operate and shutdown without undue risk to the health and safety of the public. In the event of a design basis fire, this requirement means that the ESBWR plant is capable of safely shutting down and maintaining a safe shutdown condition, while not posing a hazard to the public or operating personnel, and that recovery from the fire is capable of being accomplished safely.

This FHA identifies and evaluates the hazard of fires relative to maintaining the safe shutdown capability of the plant. Since many elements of an effective program are administrative or procedural in nature, this FHA does not evaluate the overall fire protection program for an ESBWR, but rather assumes that an ESBWR owner has an effective fire protection program in place. As described in Regulatory Guide 1.189, the primary objectives of a fire protection program at a nuclear plant are to minimize both the probability of occurrence and the consequences of fire. To meet these objectives, the fire protection program is designed to provide reasonable assurance, through defense in depth, that a fire does not prevent the performance of necessary safe shutdown functions and that radioactive releases to the environment in the event of a fire is minimized.

9A.2 ANALYSIS CRITERIA

9A.2.1 Codes and Standards

Applicable codes and standards, as shown on Table 9A.2-1, are incorporated into the design of the ESBWR Standard Plant including the fire detection and suppression system design to the maximum extent practical. These codes and standards may differ slightly from those listed in Nuclear Regulatory Commission (NRC) Branch Technical Position SPLB 9.5-1 in order to reflect the applicable code titles specified in the 2004 National Fire Code by the National Fire Protection Association (NFPA). Tables 1.9-20, 1.9-21, 1.9-22, and 1.9-23 identify the relevant edition for each applicable regulation code and standard.

9A.2.2 Fire Area Separation and Fire Equipment Drawings

Fire Zone drawings showing the fire area separation and type of fire protection suppression used for the Reactor Building, Fuel Building, Control Building, Turbine Building, Radwaste Building, Electrical Building, and Yard are identified in the List of Illustrations. A Fire area separation is provided between Yard Buildings and the Nuclear and Turbine Islands in accordance with NFPA 804 Paragraph 8.9 as expanded on in NFPA 80A Section A 3.2.2 ("Recommended Practice for Protection of Buildings from Exterior Fire Exposures").

9A.2.3 Terminology

Fire Area – that portion (aggregate floor area) of a building or plant enclosed and bounded by fire walls, fire barriers, exterior walls, fire-resistance rated horizontal assemblies of a building, or other means in order to contain fire within that area.

Fire Barrier – a continuous vertical or horizontal fire-resistance rated construction assembly designed and constructed to limit the spread of heat and fire and to restrict the movement of smoke. Rated fire barriers are those fire barriers (e.g., walls, floors, ceilings, and their supports, including beams, joists, columns, penetration seals or closures, fire doors and fire dampers) that are rated, or capable of being rated, by approving laboratories in hours of resistance to fire and are used to prevent the spread of potential fire. Fire barriers that define the boundaries of a fire area should have a fire-resistance rating of at least three hours. All openings (doors, windows, penetrations, ductwork, etc) through fire barriers should be properly protected, sealed, and qualified by fire endurance testing to a fire resistance rating as required by the applicable codes, up to the same fire resistance rating of the fire barrier itself.

Fire Suppression – control and extinguishing of fires. Manual fire suppression includes the use of hoses, portable extinguishers, or fixed systems by plant personnel. Automatic fire suppression is the use of automatically actuated, fixed systems such as water sprinkler systems or low-pressure carbon dioxide systems.

Fire Wall – a fire-resistance rated wall having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof, with sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall.

Fire Zones – subdivisions of a fire area based on the fire hazards analysis that demonstrate that the fire protection systems and features within the fire zones provide an appropriate level of protection for the associated hazards.

Noncombustible Materials – materials having any one of the following characteristics:

- Materials of which no part can ignite and burn, support combustion, or release flammable vapors when subjected to a fire or heat; this includes wet resin in tanks or other similar potentially combustible materials that are continuously immersed in water are not considered a viable combustible for exposure fires due to the significant amount of heating that would be required to dry out the material before combustion could occur;
- Materials having a structural base of non-combustible material, as defined in the above item, with a surfacing not over 3 mm (l/8 inch) thick which has a flame spread rating not higher than 50 when measured using American Society for Testing and Materials (ASTM) E84; and
- Materials, other than as described in the above two items, having a surface flame spread rating not higher than 25 without evidence of continued progressive combustion and of such composition that surfaces that would be exposed by cutting through the material in any way would not have flame spread rating higher than 25 without evidence of continued progressive combustion.

The flame-spread ratings referred to above are obtained according to NFPA 255.

Safety-Related Structures, Systems and Components - are as defined in 10 CFR 50.2.

Sprinkler System - a network of piping connected to a reliable water supply to distribute the water throughout the area protected and discharges the water through sprinklers in sufficient quantity either to extinguish the fire entirely or to prevent its spread. The system, usually activated by heat, includes a controlling valve and a device for actuating an alarm when the system is in operation. The following categories of sprinkler systems are defined in NFPA 13:

- Wet-pipe System;
- Dry-pipe System;
- Preaction System;
- Deluge System;
- Combined Dry-pipe and Preaction System; and
- On-Off System.

Standpipe and Hose Systems - fixed piping systems with hose outlets, hoses, and nozzles connected to a reliable water supply to provide effective fire hose streams to specific areas inside of the buildings.

Water Spray System - a special fixed pipe system connected to a reliable source of fire protection water supply and equipped with open-head spray nozzles for specific water discharge and distribution over surface or area to be protected. The piping system is connected to the water supply through an automatic or manually actuated valve to initiate the flow of water.

Wet Standpipe System - a standpipe system having piping containing water at all times. The ESBWR design utilizes a Class III wet standpipe system which provides a 38 mm (1.5-inch) hose station to supply water for use by building occupants and 65 mm (2.5-inch) hose connections to supply a larger volume of water for use by fire departments and those trained in handling heavy fire streams such as the fire brigade.

9A.2.4 Acceptance Criteria

The following basic guidelines have been used as criteria for the fire hazard analysis, to be conducted in accordance with Regulatory Guide 1.189 and NFPA 804:

(1) The analysis is based on the existing design and on the currently specified, but not yet purchased, equipment. The analysis provides a basis for evaluating the fire protection characteristics and features of equipment as it is purchased.

(2) Automatic sprinkler systems are provided in the ESBWR design for areas in which either installed combustible loading is large enough to warrant the installation or a significant transient combustible loading is most likely to occur as a result of combustibles introduced by normal maintenance operations. The fire hazard analysis is based on the introduction of transient combustibles to any area of the plant, subject to administrative controls. Control of combustible transient materials is assumed to comply with Regulatory Guide 1.39 for housekeeping requirements.

As described in Appendix 9B, the combustible loading limit for electrical areas has been conservatively determined as 1400 MJ/m^2 (123,300 Btu/ft^2) and the combustible loading limit for all other indoor areas has been conservatively determined as 700 MJ/m^2 (61,660 Btu/ft^2) rooms that exceed these limits require automatic fire suppression. This approach conservatively assumes that all combustible material within a fire area instantaneously releases its net heat content upon ignition of the fire. Due to the considerable separation and fire barriers provided in the ESBWR plant layout, a detailed analysis or modeling of fire damage and plume temperatures resulting from any given fire was not considered necessary and has not been performed. This type of analysis could be performed later for an individual fire area if needed, but then could also include consideration of room height and volume, spatial location of combustibles and equipment, incomplete combustion, time-weighted heat release rates, thermal inertia of the structure, ventilation effects, response of installed automatic fire detection, response of installed fire suppression, and other relevant factors.

(3) The buildings are generally of reinforced concrete construction. The walls, floors, and ceilings have 3-hour fire resistance ratings where required based on high combustible loadings (lubrication oil tank, for example) in the room or where an adjacent room contains equipment or systems from a different Safety-Related division. Corridors and stairwells that do not communicate between areas of different Safety-Related divisions may have walls and doors with a 2-hour minimum fire rating for personnel protection during egress from the areas. Non-concrete interior walls are constructed of metal studs and gypsum wallboard to the required fire resistance rating.

(4) Doors penetrating rated fire barriers comply with NFPA ratings for that barrier. There are also doors that provide fire area separation that may not be labeled fire doors but do

provide equivalent protection. Typically these are the doors for the personnel air lock into the reactor containment and the missile/tornado doors at the equipment access entrance to the reactor building (RB). The term "doors," where used in the analysis means doors, frames, and hardware.

The use of 1.5-hour fire rated elevator doors in 3-hour fire-rated barriers does not compromise the fire barrier. Rather, section 6-1.2.2 of NFPA 804-1995 specifically allows 1.5-hour fire-rated doors in elevator shafts. No other applicable codes (International Building Code [IBC], NFPA 80, NFPA 101, NFPA 252, or American Society of Mechanical Engineers [ASME] standard A17.1) require elevator doors to have a fire rating of more than 1.5 hours. None of the applicable codes address 3-hour fire-rated elevator shafts. It is not unusual for a door in a fire-rated wall to have a lower fire rating than the applicable firewall, because the area on both sides of the door is normally kept free of combustible material to ensure use of the door. Personnel evacuating from a fire are warned by signage at each elevator to use stairs (protected by 3-hour firewalls and doors) and not elevators during a fire.

(5) The fireproofing of structural steel members, where required by calculation based on combustible loading, is accomplished by application of an Underwriters Laboratory (UL)-listed or Factory Mutual (FM)-approved cementitious or ablative material, or by an UL-listed or FM-approved boxing design. The required fire rating determines the fireproofing material thickness. Gypsum board is utilized for protection of fireproofing in high traffic or office areas.

(6) Surface finishes are specified to have a flame spread, fuel-contributed, and smoke-evolved index of 25 or less (Class A), determined by ASTM E84 (NFPA 255).

(7) The use of plastic materials, including electrical cable insulation, is minimized in the ESBWR design.

(8) Suspended ceilings are used in some areas of the plant. The ceilings, including the lighting fixtures, are of noncombustible construction.

(9) The electrical cable fire-stops are tested to demonstrate a fire rating equal to the rating of the barrier they penetrate. As a minimum the penetrations meet the requirements of NUREG-1552, including Supplement 1. The tests are performed or witnessed by a representative of a qualified, independent testing laboratory. The documented test results for the acceptable fire-stops are made a part of the plant design records.

(10) Electrical cable insulation in either solid metal enclosed raceways or concrete duct banks does not represent a combustible fire load and is excluded from the combustible loading analysis.

(11) Control, power, or instrument cables and equipment of redundant systems used for bringing the reactor to hot shutdown and maintaining safe shutdown, are separated from each other by three hour rated fire barriers, except within the containment and where the equipment of more than one division is required to be located within a single fire area. Where multiple divisions of cable or equipment are located in the same fire area, the acceptability of the configuration is evaluated in Section 9A.6.

(12) Certain areas of the plant have cable trays in stacked array. Where stacking of trays occurs, power cable, which is the most susceptible to internally generated fires, is routed in the uppermost tray to the greatest extent possible to provide isolation from other trays in the stack.

The fire loading of electrical cable in trays is based on flame-retardant, cross-linked polyethylene insulation having a maximum calorific value of 29.8 MJ/kg (12,800 Btu/lbm).

The cable trays are assumed to have the maximum (40%) design fill; actual cable fills may be lower.

The analysis uses 50. kilograms of insulation per square meter (10 lbm/ft^2) of tray. The combustible loading is based on maximum loading. As cables drop out of (exit) trays, the fire loading decreases. Cable insulation in completely enclosed (i.e., solid-bottom and solid-cover) trays or steel conduits is not considered to be a contributory, exposed combustible fire load to the area.

(13) Cables for local indication are included in the safe shutdown analysis where failure of the cable could cause failure of functionally associated circuits or where required to provide either diagnostic or process parameter information for recovery.

(14) Total reliance on a single fire suppression method is not used. At least two fire suppression methods are available to suppress a fire in each fire area. The plant design provides the following types of suppression methods and utilizes them in suitable combination for the fire hazard considered:

a. Automatic wet-pipe sprinkler system;

b. Automatic preaction sprinkler system;

c. Automatic dry-pipe sprinkler system;

d. Automatic preaction foam water sprinkler system;

e. Automatic foam water deluge system;

f. Automatic dry-pilot deluge system;

g. Internal manual water spray system;

h. Internal low pressure carbon dioxide flooding system;

i. Standpipe and hose racks;

j. Portable Class ABC fire extinguishers;

k. Portable Carbon Dioxide Class BC fire extinguishers; and

l. Portable Class D fire extinguishers.

(15) The design of the water supply system ensures delivery of water to the standpipe and hose rack systems concurrent with a single active failure. The standpipe system and one diesel driven fire pump and one electric fire pump, their water supply, their suction piping, and their discharge piping throughout the Reactor, Fuel, and Control Buildings are designed to remain functional following a Safe Shutdown Earthquake (SSE). The standpipes which

supply firewater to hose stations covering safe shutdown equipment are contained within the concrete stairwells or dedicated concrete chases, and thus, are protected from other phenomena of less severity and greater frequency.

(16) The effect of pipe breaks in fire suppression systems and protection methods for the effect of pipe breaks meet the criteria specified in Section 3.4 and Subsection 9.5.1.

(17) The floor drains are sized to handle both leakage from a crack in the standpipes or simultaneous operation of two fire hose streams. See Subsection 9.3.3 for details of the plant drainage system.

(18) Piping and cable tray penetrations are provided with fire-stops when penetrating fire rated barriers.

(19) Heating, Ventilation and Air Conditioning (HVAC) penetrations through 2-hour or 3-hour rated fire barriers are provided with fire dampers compatible with the rating of the fire barrier.

(20) Spill control is provided to contain the contents of any above grade oil-filled vessel or tank larger than 208 liters (55 gallons) and all tanks containing chemicals used in water/wastewater treatment or quality control.

In accordance with NFPA 804 and Regulatory Guide (RG) 1.189, the following design criteria are used for fire containment sizing:

Drainage and any associated drainage facilities for a given area is sized to accommodate the volume of liquid produced by all the following:

a. The spill of the largest single container of any flammable or combustible liquids in the area.

b. Where automatic suppression is provided throughout, the credible volume of discharge (as determined by the fire hazards analysis) for the suppression systems operating for a period of 30 minutes.

c. Where automatic suppression is not provided throughout, the contents of piping systems and containers that are subject to failure in a fire.

d. Where the installation is outside, credible environmental factors such as rain and snow.

e. Where automatic suppression is not provided throughout, the volume is based on a manual fire-fighting flow rate of 1900 l/m (500 gal/m) for a duration of 30 minutes, unless the fire hazards analysis demonstrates a different flow rate and duration.

(21) The post-fire safe-shutdown circuit analysis will assume that any spurious actuations associated with a postulated fire occur simultaneously or in rapid succession.

(22) Circuit routing will conform to the methodology provided in Revision 1 of NEI 00-01, Guidance For Post-Fire Safe Shutdown Analysis, in accordance with RIS 05-030, NRC Regulatory Issue Summary 05-30, Clarification of Post-Fire Safe Shutdown Circuit Regulatory Requirements.

9A.2.5 Systems Required to Achieve Safe Shutdown in the Event of Fire

In case of a design basis fire, certain systems may be required when the Nuclear Steam Supply System (NSSS) is isolated from the main condenser during shutdown or accident conditions.

The main steam lines and feedwater lines provide the core-cooling path to and from the main condenser during normal operation at power or during startup or shutdown transients when the reactor is not isolated.

The safe shutdown functions are accomplished through interaction of various passive Safety-Related systems. The safe shutdown systems provide one or more of the following functions:

- Maintenance of reactor vessel water level;
- Pressure control or depressurization of the reactor pressure vessel;
- Heat removal;
- Heat sink;
- Direct Current (DC) electrical power; and
- Indication and control.

Instrumentation automatically activates the safe shutdown systems or provides signals to the Main Control Room operators.

Table 9A.2-2 shows the systems that provide one or more of the safe shutdown functions in the case of fire. The table includes the operating mode or modes for each system, the functions performed, reactor conditions that require system operation, the divisional assignment, the backup system, and Tier 2 references for system description.

A sufficient number of safe shutdown systems remain available during and following a design basis fire to achieve hot shutdown and maintain safe shutdown.

9A.2.6 Redundant Nonsafety-Related Systems and Equipment

In case of a design basis fire, no nonsafety-related systems are required to achieve hot shutdown and maintain safe shutdown. Nonetheless, certain nonsafety-related systems and equipment include redundancy to provide operational flexibility and robustness. In general terms, the redundant components within a nonsafety-related system are referred to as Train A and Train B (and in some cases, Train C). To maintain the redundancy and robustness for these, fire-rated separation is provided between the redundant Train A and Train B (and Train C, where applicable) components for these certain nonsafety-related systems.

The design of the ESBWR has included redundancy within the following nonsafety-related systems:

- Reactor Water Cleanup / Shutdown Cooling System;
- Reactor Component Cooling Water System;
- Plant Service Water System;
- Fuel and Auxiliary Pools Cooling System;

- Reactor Building and Control Building sumps in the Equipment and Floor Drains System;
- RB HVAC System;
- Fuel Building (FB) HVAC System;
- Control Building (CB) HVAC System;
- Nonsafety-Related Distributed Control and Information System (N-DCIS) System;
- Instrument Air System;
- Chilled Water System;
- Seismic fire pumps within the Fire Protection System;
- Offsite power supplies (transformers);
- Onsite power supplies (diesel generators and auxiliary equipment); and
- Electrical power distribution to all of the above.

Table 9A.2-1

Fire Protection Codes and Standards

Refer to Tables 1.9-20, 1.9-21, 1.9-22, and 1.9-23 for applicable editions.

28 CFR 36	Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
10 CFR 50	Domestic Licensing of Production and Utilization Facilities
UL Directory	Fire Protection Equipment Directory
FM	Factory Mutual Approval Guide
ANI Manual	Basic Fire Protection for Nuclear Power Plants
NFPA 10	Standard for Portable Fire Extinguishers
NFPA 11	Standard for Low-, Medium-, and High-Expansion Foam Systems
NFPA 12	Standard for Carbon Dioxide Extinguishing Systems
NFPA 13	Standard for the Installation of Sprinkler Systems
NFPA 14	Standard for the Installation of Standpipe and Hose Systems
NFPA 15	Standard for Water Spray Fixed Systems for Fire Protection
NFPA 16	Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
NFPA 20	Standard for the Installation of Stationary Pumps for Fire Protection
NFPA 22	Standard for Water Tanks for Private Fire Protection
NFPA 24	Standard for the Installation of Private Fire Service Mains and their Appurtenances
NFPA 30	Flammable and Combustible Liquids Code
NFPA 37	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
NFPA 50A	Standard for Gaseous Hydrogen Systems at Consumer Sites

Table 9A.2-1

Fire Protection Codes and Standards

Refer to Tables 1.9-20, 1.9-21, 1.9-22, and 1.9-23 for applicable editions.

NFPA 51B	Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 75	Standard for the Protection of Information Technology Equipment
NFPA 80	Standard for Fire Doors and Windows
NFPA 80A	Recommended Practice for Protection of Buildings from Exterior Fire Exposures
NFPA 90A	Standard for the Installation of Air-Conditioning and Ventilating Systems
NFPA 92A	Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences
NFPA 101	Life Safety Code
NFPA 204	Standard for Smoke and Heat Venting
NFPA 241	Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 251	Standard Methods of Tests of Fire Endurance of Building Construction and Materials
NFPA 252	Standard Methods of Fire Tests of Door Assemblies
NFPA 255	Standard Method of Test of Surface Burning Characteristics of Building Materials
NFPA 497	Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
NFPA 600	Standard on Industrial Fire Brigades
NFPA 701	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
NFPA 780	Standard for the Installation of Lightning Protection Systems
NFPA 801	Standard for Fire Protection Practices for Facilities Handling Radioactive Materials

Table 9A.2-1

Fire Protection Codes and Standards

Refer to Tables 1.9-20, 1.9-21, 1.9-22, and 1.9-23 for applicable editions.

NFPA 804	Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants
NFPA 1404	Standard for Fire Service Respiratory Protection Training
NFPA 1451	Standard for a Fire Service Vehicle Operations Training Program
NFPA 1500	Standard on Fire Department Occupational Safety and Health Program
NFPA 1961	Standard for Fire Hose
NFPA 1962	Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose
NFPA 1963	Standard for Fire Hose Connections
NFPA 1964	Standard for Spray Nozzles
ASHRAE 15	Safety Standard for Refrigeration Systems
ASME A17.1	Safety Code for Elevators and Escalators
ASME B31.1	Power Piping
ASME NQA-1	Quality Assurance Program Requirements for Nuclear Facilities
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E119	Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E814	Standard Test Method for Fire Tests for Through-Penetration Fire Stops
IBC	International Building Code
IFC	International Fire Code
ADA	American Disability Act Accessibility Guidelines – 28 CFR 36
IEEE 383	Standard for Qualifying Class 1E Electric Cables and Field Splices for Nuclear Power Generating Stations
IEEE 384	Standard Criteria for Independence of Class 1E Equipment and Circuits

Table 9A.2-1

Fire Protection Codes and Standards

Refer to Tables 1.9-20, 1.9-21, 1.9-22, and 1.9-23 for applicable editions.

IEEE 603	Standard Criteria for Safety Systems for Nuclear Power Generating Stations
IEEE 1202	Standard for Flame-Propagation Testing of Wire and Cable
IEEE C2	National Electric Safety Code
Regulatory Guide 1.13	Spent Fuel Storage Facility Design Basis
Regulatory Guide 1.39	Housekeeping Requirements for Water-Cooled Nuclear Power Plants
Regulatory Guide 1.75	Criteria for Independence of Electrical Safety Systems
Regulatory Guide 1.189	Fire Protection for Operating Nuclear Power Plants
NUREG-0800, SRP Section 9.1.3	Spent Fuel Pool Cooling and Cleanup System
NUREG-0800, SRP Section 9.5.1	Fire Protection Program
NUREG-0800, BTP SPLB 9.5-1	Guidelines for Fire Protection for Nuclear Power Plants
NUREG-0800, BTP SPLB 9.5-1	Appendix B, Supplemental Fire Protection Review Criteria for Advance Reactors
NUREG-1552	Fire Barrier Penetration Seals in Nuclear Power Plants
RIS 05-030	NRC Regulatory Issue Summary 05-030 Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements
NEI 00-01	Guidance For Post-Fire Safe Shutdown Analysis

Table 9A.2-2

Systems Required to Achieve Safe Shutdown in the Event of Fire

System	Function (see footnote)	Reactor Condition	Division	Backup System	Tier 2 Ref.	Remarks
ICS A	1/2/3/4	Isolation	Any two of four	ICS B ICS C ICS D	5.4.6	Closed loop to and from reactor vessel.
ICS B	1/2/3/4	Isolation	Any two of four	ICS A ICS C ICS D	5.4.6	Closed loop to and from reactor vessel.
ICS C	1/2/3/4	Isolation	Any two of four	ICS A ICS B ICS D	5.4.6	Closed loop to and from reactor vessel.
ICS D	1/2/3/4	Isolation	Any two of four	ICS A ICS B ICS C	5.4.6	Closed loop to and from reactor vessel.
GDCS A	1	Depressurized	Any two of four	GDCS B GDCS C GDCS D	6.3.2.7	
GDCS B	1	Depressurized	Any two of four	GDCS A GDCS C GDCS D	6.3.2.7	
GDCS C	1	Depressurized	Any two of four	GDCS A GDCS B GDCS D	6.3.2.7	
GDCS D	1	Depressurized	Any two of four	GDCS A GDCS B GDCS C	6.3.2.7	

Table 9A.2-2

Systems Required to Achieve Safe Shutdown in the Event of Fire

System	Function (see footnote)	Reactor Condition	Division	Backup System	Tier 2 Ref.	Remarks
ADS A	2	Isolated	Any two of four	ADS B, C, D ICS B, C, D	6.3.2.8	
ADS B	2	Isolated	Any two of four	ADS A, C, D ICS A, C, D	6.3.2.8	
ADS C	2	Isolated	Any two of four	ADS A, B, D ICS A, B, D	6.3.2.8	
ADS D	2	Isolated	Any two of four	ADS A, B, C ICS A, B, C	6.3.2.8	
PCCS A	3/4	Post Depressurization	—	PCCS B, C, D, E, F	6.2.2	Closed piping connections to GDCS and suppression pools.
PCCS B	3/4	Post Depressurization	—	PCCS A, C, D, E, F	6.2.2	Closed piping connections to GDCS and suppression pools.
PCCS C	3/4	Post Depressurization	—	PCCS A, B, D, E, F	6.2.2	Closed piping connections to GDCS and suppression pools.
PCCS D	3/4	Post Depressurization	—	PCCS A, B, C, E, F	6.2.2	Closed piping connections to GDCS and suppression pools.
PCCS E	3/4	Post Depressurization	—	PCCS A, B, C, D, F	6.2.2	Closed piping connections to GDCS and suppression pools.

Table 9A.2-2

Systems Required to Achieve Safe Shutdown in the Event of Fire

System	Function (see footnote)	Reactor Condition	Division	Backup System	Tier 2 Ref.	Remarks
PCCS F	3/4	Post Depressurization	—	PCCS A, B, C, D, E	6.2.2	Closed piping connections to GDCS and suppression pools.
Div 1 instrument power & signals	5/6/7	All	1	Division 2, 3, or 4	7.2, 7.3	
Div 2 instrument power & signals	5/6/7	All	2	Division 1, 3, or 4	7.2, 7.3	
Div 3 instrument power & signals	5/6/7	All	3	Division 1, 2, or 4	7.2, 7.3	
Div 4 instrument power & signals	5/6/7	All	4	Division 1, 2, or 3	7.2, 7.3	

Functions:
1 - maintain reactor water level

2 - depressurize the reactor vessel

3 - heat removal

4 - heat sink

5 - electrical power

6 - control (includes logic systems power for initiation of RPS and safe shutdown systems)

7 - monitoring/indication

Figure 9A.2-1. Nuclear Island Fire Protection Zones ESBWR DCD EL –11500

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-2. Nuclear Island Fire Protection Zones ESBWR DCD EL –6400

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-3. Nuclear Island Fire Protection Zones ESBWR DCD EL -1000

Figure 9A.2-4. Nuclear Island Fire Protection Zones ESBWR DCD EL 4650

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-5. Nuclear Island Fire Protection Zones ESBWR DCD EL 9060

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-6. Nuclear Island Fire Protection Zones ESBWR DCD EL 13570

Figure 9A.2-7. Nuclear Island Fire Protection Zones ESBWR DCD EL 17500

Figure 9A.2-8. Nuclear Island Fire Protection Zones ESBWR DCD EL 27000

Figure 9A.2-9. Nuclear Island Fire Protection Zones ESBWR DCD EL 34000

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-10. Nuclear Island Fire Protection Zones ESBWR DCD SEC A-A

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-11. Nuclear Island Fire Protection Zones ESBWR DCD Section "B-B"

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-12. Turbine Island Fire Protection Zones ESBWR DCD EL. –1400

Figure 9A.2-13. Turbine Building Fire Protection Zones ESBWR DCD EL 4650

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-14. Turbine Island Fire Protection Zones ESBWR DCD EL. 12000

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-15. Turbine Island Fire Protection Zones ESBWR DCD EL. 20000

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-16. Turbine Island Fire Protection Zones ESBWR DCD EL. 28000

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-16a. Turbine Building Fire Protection Zones ESBWR DCD EL 35000

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-17. Turbine Island Fire Protection Zones ESBWR DCD EL. Various

Figure 9A.2-18. Turbine Building Fire Protection Zones ESBWR DCD Section A-A

Figure 9A.2-19. Turbine Building Fire Protection Zones ESBWR DCD Section B-B

Figure 9A.2-20. Radwaste Building Fire Protection Zones ESBWR DCD EL -9350

Figure 9A.2-21. Radwaste Building Fire Protection Zones ESBWR DCD EL –2350

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-22. Radwaste Building Fire Protection Zones ESBWR DCD EL 4650

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-23. Radwaste Building Fire Protection Zones ESBWR DCD EL 10650

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-24. Radwaste Building Fire Protection Zones ESBWR DCD Section A-A

Figure 9A.2-25. Electrical Building Fire Protection Zones ESBWR DCD EL 4650

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-26. Electrical Building Fire Protection Zones ESBWR DCD EL 9800

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-27. DELETED

Figure 9A.2-28. Electrical Building Fire Protection Zones ESBWR DCD EL 18000

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-29. DELETED

Figure 9A.2-30. Electrical Building Fire Protection Zones ESBWR DCD EL 27000

Figure 9A.2-31. Electrical Building Fire Protection Zones ESBWR DCD EL (Various)

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

Figure 9A.2-32. Electrical Building Fire Protection Zones ESBWR DCD Section A-A

Figure 9A.2-33. Site Fire Protection Zones ESBWR DCD Plot Plan

{{{Security-Related Information - Withheld Under 10 CFR 2.390.}}}

9A.3 ANALYSIS APPROACH

9A.3.1 Review Data

The fire hazards analysis is based on a review of every fire area, using the defense in depth approach from NFPA 804 and Regulatory Guide 1.189. Defense in depth is defined as a principle aimed at providing a high degree of fire protection by inclusion of these three concepts: 1) preventing potential fires from starting; 2) quickly detecting those fires that occur, and promptly controlling and extinguishing fires to limit damage; and, 3) providing structural protection (such as fire-rated barriers) for buildings, equipment, and circuits so that a fire that is not promptly extinguished does not prevent safe shutdown, cause loss of life, or result in radioactive release in excess of 10 CFR 20 limits. None of the defense in depth concepts is complete by itself.

The analysis is based on a review of every room for the Reactor Building, Fuel Building, Control Building, Turbine Building, Radwaste Building, Electrical Building, and Yard, as well as the overall design acceptance criteria for the Pump House, Guard House, Hot Machine Shop, Service Water/Water Treatment Building, Cold Machine Shop, Warehouse, Training Center, Service Building, Auxiliary Boiler Building, Fire Pump Enclosure, Ancillary Diesel Building and Administration Building. The following data has been gathered for each fire area or room reviewed:

(1) Identification for the Safety-Related equipment within each fire area. Nonsafety-related equipment is not required for safe shutdown;

(2) Identification of fire areas containing radioactive material that could be released to the exclusion area or beyond should a fire occur in that area;

(3) Definition of the rated fire barriers surrounding a specific room or rooms that allow classifying the room or rooms as a separate fire area. Non-rated barriers for which an equivalency to a fire barrier is claimed are also identified;

(4) A specific listing of types, quantities and characteristics of significant combustibles within a fire area that could constitute a combustible load;

(5) Quantitative listing of fire loadings that represent the combustibles identified for each fire area;

(6) Listing of all the fire detection and suppression capabilities provided and their accessibility for each room. Note that fire detection is also installed within HVAC ductwork as required by NFPA 90A but is not credited in the fire hazards analysis for early detection of any fire within a single fire area;

(7) An analysis of each fire area identifying the design criteria employed in providing fire protection for the equipment within the fire area. Safety-related equipment is separated on a divisional basis by 3-hour rated fire barriers, except equipment mounted in the control room or containment, as well as for equipment covered by special cases that are discussed in Section 9A.6 (for more information on safety-related equipment, fire separation and safe shutdown, see Subsection 9.5.1). Fire detection, fire suppression, and fire stop capabilities are also discussed in the analysis;

(8) An analysis defining the worst-case consequences of the fire for each fire area. This is stated as loss of safe shutdown function and identifies the divisional backup capability available for safety-related systems;

(9) An analysis of each fire area addressing the consequences of fire, if the fire protection system functions as designed. The fire protection system is defined as having the capability to detect, contain, and extinguish the fire. The ability to restrict the fire to a discrete area, the result of the introduction of water to the fire area, and the capability of extinguishing the fire by various means of suppression are stated. See Section 3.4, for a discussion of pipe break consequences;

(10) Design provisions for protecting the functional capability of safety-related systems and associated cabling from the results of inadvertent operation, careless operation, or rupture of the extinguishing systems in each fire area are stated;

(11) The means of containing or inhibiting the progress of a fire in each fire area (defined as the use of a fire-resisting enclosure or barrier, fire-stops at wall penetrations, ventilation fire dampers, curbs, or fire doors into the area); and

(12) Room numbers are shown on the analysis pages that conform to those shown on the fire zone drawings.

9A.3.2 Steam Tunnel Barrier Exception

The steam tunnel in the Reactor Building opens into the Turbine Building without a barrier wall to allow venting of steam to the Turbine Building in the event of a major steam line leak in the steam tunnel within the Reactor Building. All openings in the steam tunnel are protected by either fire dampers or doors, including the walls, floors, and ceilings. An automatic, open-head water spray system is provided to serve as a water curtain fire barrier between the Turbine Building and Reactor Building portions of the steam tunnel.

9A.3.3 Exceptions to Separation Criteria

A specific analysis is prepared for each fire area in the containment and Main Control Room that contains redundant systems of safety-related equipment or electrical cables. This analysis confirms that adequate protection has been provided by means of separation by distance, physical barriers, electrical isolation, electrical circuit characteristics, or adequate backup systems. The analyses are in Section 9A.6, Special Cases.

9A.3.4 Exceptions to Penetration Requirements

The Drywell Inerting System supply ductwork (piping) for the wetwell and the drywell passes through a fire barrier but does not have fire dampers. These consist of two supply lines (each 350 mm (14 in.) nominal diameter) and two exhaust lines (one 350 mm (14 in.) nominal diameter and one 400 mm (16 in.) nominal diameter). There are two containment isolation valves for each supply and exhaust piping penetration. The isolation valves are normally closed except during plant outage periods, when smoke removal could be accomplished without interruption if a fire occurs.

9A.3.5 Wall Deviations

The wall descriptions below represent anticipated deviations from tested and approved 3-hr, fire-resistive assemblies. The designs were previously submitted and approved in the General Electric Standard Safety Analysis Report II Standard Safety Analysis Report.

The Type 1 wall design exceeds the design of the tested and approved assembly from which it was adapted. The Type 2 assembly requires a UL test.

Type 1 wall—The Type 1 wall is designed with 0.15-meter (6-in) metal studs at 0.30-meter (12-in) on center (seismic design) with three layers of 0.016-meter (5/8-in) fire code gypsum board on each side of the studs. The design is adapted from International Conference of Building Officials 1495 for a 3-hour partition. The only deviation from the standard is that the gage thickness of the structural members has been increased to meet higher seismic requirements.

Type 2 wall—The Type 2 wall is a variation of Type 1 with 0.15-meter (6-in) metal studs at 0.30-meter (12-in) on center between 0.15-meter (6-in) steel, wide-flange columns at 1.22-meter (4-ft) on center. Three layers of 0.016-meter (5/8-in) fire code gypsum board line one side while 0.013-meter (1/2-in) thick steel plate for bullet resistance and two layers of 0.016-meter (5/8-in) fire code gypsum board line the other side.

9A.3.6 Door Deviations

Certain doors throughout the facility have a multi-purpose function such as fire, tornado, pressure, missile, seismic, water tight, or air tight or a combination of functions. Where possible, these doors are rated or labeled doors and are identified as rated doors.

When other criteria require the manufacturer to design the door for some other purpose, the door is identified as equivalent to a fire rated door. The doors, except for the Reactor Building equipment access door, are required to have a UL or FM label. Where the door is not constructed as a fire door, such as a containment personnel airlock, it is identified by its main function.

The use of 1.5-hour fire rated elevator doors in 3-hour fire-rated barriers does not compromise the fire barrier. Rather, section 6-1.2.2 of NFPA 804-1995 specifically allows 1.5-hour fire-rated doors in elevator shafts. No other applicable codes (IBC, NFPA 80, NFPA 101, NFPA 252, or ASME A17.1) require elevator doors to have a fire rating of more than 1.5 hours. None of the applicable codes address 3-hour fire-rated elevator shafts. It is not unusual for a door in a fire-rated wall to have a lower fire rating than the applicable fire wall, because the area on both sides of the door is kept free of combustible material to ensure use of the door. Personnel evacuating from a fire are warned by signage at each elevator to use stairs (protected by 3-hour firewalls and doors) and not elevators during a fire.

9A.3.7 Basemats

In general, concrete basemats are not required to be fire-rated because of the lack of any fire hazard in the ground beneath the basemats. The substantial thickness of concrete basemats would provide a large fire rating, if so required.

9A.3.8 Smoke Removal

See Subsection 9.5.1.11 for details of smoke removal provisions in buildings containing safety-related equipment. In general, smoke, heat, and products of combustion can be exhausted from a fire area by operation of the HVAC system in the purge or exhaust mode, once the fire has been extinguished by the fire protection system.

9A.4 FIRE HAZARD AND SAFE SHUTDOWN ANALYSIS SUMMARY

For fire hazard and safe shutdown analysis for each individual fire area (assuming that automatic and manual fire suppression equipment does not function), see Tables 9A.5-1 through 9A.5-7.

9A.4.1 Reactor Building

As shown on the fire zone drawings (Figures 9A.2-1 through 9A.2-11), with the exception of the Drywell/Containment and Main Steam Tunnel, the Reactor Building is subdivided by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage to not more than one Safety division. This arrangement allows any combination of the remaining three divisions to achieve and maintain safe shutdown.

Damage from a fire in the upper drywell is limited to one train of safe shutdown components because of the separation of redundant components, low combustible loading, and primary containment inerting during power operation: and therefore exceptions are justified. Redundant valves are spatially separated and are designed to fail as-is on loss of actuation power.

During plant shutdown, reactor cooling is provided by either the Reactor Water Cleanup/Shutdown Cooling system (RWCU/SDC) or the Fuel and Auxiliary Pools Cooling System (FAPCS). A fire in the lower drywell, could affect the operation of the RWCU/SDC, but not the FAPCS system to maintain core cooling. A fire in the upper drywell does not prevent either the RWCU/SDC or the FAPCS from providing core cooling through the feedwater lines. A fire in the wetwell does not prevent either the RWCU/SDC or FAPCS from providing core cooling. The redundant RWCU/SDC, FAPCS, and Reactor Component Cooling Water System (RCCWS) pumps are powered from separate diesel generator backed electrical load groups.

A fire within the containment does not prevent the FAPCS from providing spent fuel pool cooling. The fire protection system can be used through a cross-connect to provide makeup water to the FAPCS.

Damage from a fire in the lower drywell is also limited to one train of safe shutdown components because of the separation of redundant components, low combustible loading, and primary containment inerting during power operation; and therefore exceptions are justified. Redundant valves are spatially separated and are designed to fail safe on loss of actuation power. Although fire damage may result to both Control Rod Drive (CRD) system and Hydraulic Control Unit (HCU) components from a postulated fire within the lower drywell during a plant outage, there would be no effect to plant safe shutdown because all control rods would already have been inserted into the reactor vessel at the onset of the outage and prior to removing the inerting environment. Further backup of reactor scram capability and maintenance of safe shutdown can be provided by other systems (such as Standby Liquid Control) that are located in other fire areas of the plant.

No additional means of fire detection or suppression is provided for the Isolation Condenser (IC), Passive Containment Cooling System (PCCS), Buffer, Fuel Storage, Dryer/Separator Storage, Reactor Well, Suppression, and IC/PCC Expansion Pools which are normally filled with water.

Access to the Steam Tunnel is provided by an opening between the Reactor and Turbine Buildings, and is protected by an open head spray water curtain and by a Class A shielded door from the RB.

A preaction sprinkler system is provided throughout the CRD pump room to provide personnel protection, allow egress, and limit the spread of the fire.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Seismic design of the fire suppression system piping;
- Safe shutdown components located in the primary containment are normally designed to operate in 100% relative humidity environments;
- Use of preaction type sprinkler systems, supervised with pressurized air and requiring multiple indications of fire prior to discharging water from sprinkler heads, over redundant plant equipment such as CRD pumps;
- Location of the manual suppression systems within stairwells and outside of rooms containing safety-related components to avoid spray water damage to electrical components;
- Seismic design of standpipes in the RB;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights;
- Provisions for curbs around open hatches; and
- Use of watertight doors, where required, to protect equipment.

Post-fire recovery for a design basis fire contained to a single RB fire area would involve all the components (restoration and replenishment of fire protection equipment; forensic investigation; overhaul and salvage; demolition; reconstruction to original design; and testing of restored systems to original requirements) typical of a major industrial fire, as well as the additional radiological, security access, and quality assurance controls unique to a nuclear plant. However, the resources needed to perform this restoration should be no more than that required for a major plant refueling outage. Redundancy provided in safety-related and nonsafety-related systems allows quicker restoration of plant operation, even if at a reduced power level. The inclusion of equipment access paths and hatches for all areas of the RB not only facilitates original plant construction but also major equipment replacement. Due to these factors, the potential for post-fire recovery for a design basis fire contained to a single RB fire area is considered better than currently operating nuclear plants.

Fire protection within the RB is not affected by naturally occurring hazards due to the following reasons:

- Fire barriers are an integral part of the RB, designed and installed to withstand a Safe Shutdown Earthquake (SSE);

- Fire suppression system piping in the RB is designed and installed to withstand an SSE and remain operational;
- Fire detection and alarm in the RB is seismically mounted to not collapse;
- Repair or restoration of fire detection and alarm would only require replacement of individual failed components from stored spares; and
- Protection of the fire protection system in the RB from design-basis storms, tornados, and floods is provided by the RB structure itself.

9A.4.2 Fuel Building

As shown on the fire zone drawings (Figures 9A.2-1 through 9A.2-8 and 9A.2-10), the Fuel Building is subdivided by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage to not more than one redundant train of nonsafety-related equipment. While the Fuel Building does contain safety-related or safe shutdown components, a fire in the Fuel Building does not affect any of the four divisions used to achieve and maintain safe shutdown.

No additional means of fire detection or suppression is provided for the Spent Fuel Pool which is normally filled with water.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Location of the manual suppression systems within stairwells and outside of rooms containing safety-related components to avoid spray water damage to electrical components;
- Seismic design of standpipes in the Fuel Building;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

Post-fire recovery for a design basis fire contained to a single Fuel Building fire area would involve all the components (restoration and replenishment of fire protection equipment; forensic investigation; overhaul and salvage; demolition; reconstruction to original design; and testing of restored systems to original requirements) typical of a major industrial fire, as well as the additional radiological, security access, and quality assurance controls unique to a nuclear plant. However, the resources needed to perform this restoration should be no more than that required for a major plant refueling outage. Redundancy provided in safety-related and nonsafety-related systems allows quicker restoration of plant operation, even if at a reduced power level. The inclusion of equipment access paths and hatches for all areas of the Fuel Building not only facilitates original plant construction but also major equipment replacement. Due to these factors, the potential for post-fire recovery for a design basis fire contained to a single Fuel Building fire area is considered better than currently operating nuclear plants.

Fire protection within the Fuel Building is not affected by naturally occurring hazards due to the following reasons:

- Fire barriers are an integral part of the Fuel Building, designed and installed to withstand a Safe Shutdown Earthquake (SSE);
- Fire suppression system piping in the Fuel Building is designed and installed to withstand an SSE and remain operational;
- Fire detection and alarm in the Fuel Building is seismically mounted to not collapse;
- Repair or restoration of fire detection and alarm would only require replacement of individual failed components from stored spares; and
- Protection of the fire protection system in the Fuel Building from design-basis storms, tornados, and floods is provided by the Fuel Building structure itself.

9A.4.3 Control Building

As shown on the fire zone drawings (Figures 9A.2-2 through 9A.2-5 and 9A.2-11), with the exception of the Main Control Room, the Control Building is subdivided by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage to not more than one Safety division. This arrangement allows any combination of the remaining three divisions to achieve and maintain safe shutdown.

The nonsafety-related MCR HVAC has redundant air handling units, but uses common ductwork. Where the common ductwork for one air handling unit could be exposed to fire involving the other redundant air handling unit, the HVAC ductwork is wrapped or encapsulated in 3-hour fire rated material.

Operators can evacuate the Main Control Room after scramming the reactor. The Safety System and Logic Control (SSLC) automatically actuates the Safety systems. The postulated fire assumes loss of all component functions within the Main Control Room, and spurious actuations are considered in the analysis. In order to cool the plant down, the operators can control the nonsafety-related systems from either Remote Shutdown System (RSS) panel, located in separate fire areas within the Reactor Building.

There are very few cable trays in the Main Control Room Complex. Cable access is through the floor from the divisional rooms below or overhead from the N-DCIS rooms above, and consists of power cables in flexible metallic or rigid steel conduit, fiber optic cables for the multiplexed control and instrumentation cables, and hard-wired control cables. There is a raised computer floor to allow distribution of the cables via conduit (flex or rigid) or cable pathways. There is a suspended ceiling; only cables associated with nonsafety-related lighting, the fire alarm system, and communication are routed above the false ceiling. These cables are also in conduit.

Paper within the Control Room Complex is required to be stored in approved containers (cabinets, file cabinets, waste baskets) except when in use.

Manual water spray systems are provided internal to each of the charcoal filters, to provide property protection and limit the spread of the fire.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Location of the manual suppression systems within stairwells and outside of rooms containing safety-related components to avoid spray water damage to electrical components;
- Seismic design of hose stations in the Control Building. The standpipes are located in external chases;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

Post-fire recovery for a design basis fire contained to a single Control Building fire area would involve all the components (restoration and replenishment of fire protection equipment, forensic investigation, overhaul and salvage, demolition, reconstruction to original design, and testing of restored systems to original requirements) typical of a major industrial fire, as well as the additional security access and quality assurance controls unique to a nuclear plant. However, the resources needed to perform this restoration should be no more than that required for a major plant refueling outage. Redundancy provided in safety-related and nonsafety-related systems allows quicker restoration of plant operation, even if at a reduced power level. The inclusion of equipment access paths and hatches for all areas of the Control Building not only facilitates original plant construction but also major equipment replacement. Due to these factors, the potential for post-fire recovery for a design basis fire contained to a single Control Building fire area is considered better than currently operating nuclear plants.

Fire protection within the Control Building is not affected by naturally occurring hazards due to the following reasons:

- Fire barriers are an integral part of the Control Building, designed and installed to withstand a Safe Shutdown Earthquake (SSE);
- Fire suppression system piping in the Control Building is designed and installed to withstand an SSE and remain operational;
- Fire detection and alarm in the Control Building is seismically mounted to not collapse;
- Repair or restoration of fire detection and alarm would only require replacement of individual failed components from stored spares; and
- Protection of the fire protection system in the Control Building from design-basis storms, tornados, and floods is provided by the Control Building structure itself.

9A.4.4 Turbine Building

As shown on the fire zone drawings (Figures 9A.2-12 through 9A.2-19), the Turbine Building is subdivided by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage. While the Turbine Building does contain safety-related and safe shutdown components as described in Table 9A.6-1, a fire in the Turbine Building does not affect the ability to achieve and maintain safe shutdown.

Curbs are provided at doorways and around equipment containing significant amount of oil to prevent the spread of flammable liquids.

An automatic deluge system is provided in the open steam tunnel, as a water curtain to provide the separation between Reactor and Turbine Buildings equivalent to a 3-hour fire-rated concrete barrier, and to limit the spread of the fire.

A wet-pipe sprinkler system is provided throughout the areas below the turbine that could be exposed to spreading oil, to provide personnel protection, allow egress, and limit the spread of the fire.

Preaction sprinkler systems are provided throughout the feedwater pump room and on the steam turbine bearings, to provide personnel protection, allow egress, and limit the spread of the fire.

A dry-pipe sprinkler system is provided throughout the main equipment access bay, to provide personnel protection, allow egress, and limit the spread of the fire.

Dry-pilot deluge systems are provided on the turbine hydraulic control fluid reservoir skid and seal oil units, to provide property protection and limit the spread of the fire.

A foam deluge system is provided throughout the lube oil tank room, to provide property protection and limit the spread of the fire.

Manual water spray systems are provided internal to each of the off-gas charcoal adsorbers, to provide property protection and limit the spread of the fire.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Use of preaction type sprinkler systems, supervised with pressurized air and requiring multiple indications of fire prior to discharging water from sprinkler heads, over redundant or critical plant equipment such as turbine bearings;
- Location of the manual suppression systems within stairwells and outside of rooms containing electrical components to avoid spray water damage to electrical components;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

Post-fire recovery for a design basis fire contained to a single Turbine Building fire area would involve all the components (restoration and replenishment of fire protection equipment, forensic investigation, overhaul and salvage, demolition, reconstruction to original design, and testing of restored systems to original requirements) typical of a major industrial fire, as well as the

additional radiological, security access, and quality assurance controls unique to a nuclear plant. However, the resources needed to perform this restoration should be no more than that required for a major plant refueling outage. Redundancy provided in nonsafety-related systems allows quicker restoration of plant operation, even if at a reduced power level. The inclusion of equipment access paths and hatches for all areas of the Turbine Building not only facilitates original plant construction but also major equipment replacement. Due to these factors, the potential for post-fire recovery for a design basis fire contained to a single Turbine Building fire area is considered better than currently operating nuclear plants.

The following features minimize or mitigate the effect of naturally occurring hazards on fire protection within the Turbine Building:

- Fire barriers are an integral part of the Turbine Building, designed and installed as required by the IBC for applicable seismic, wind, and hydrodynamic conditions;
- Fire suppression system piping in the Turbine Building is designed and installed to meet NFPA 13 (Table 9A.2-1) seismic requirements; and
- Protection of the fire protection system in the Turbine Building from design-basis storms, tornados, and floods is provided by the Turbine Building structure itself.

9A.4.5 Radwaste Building

As shown on the fire zone drawings (Figures 9A.2-20 through 9A.2-24), the Radwaste Building is subdivided by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage. The Radwaste Building does not contain any safety-related or safe shutdown components, and as such, a fire in the Radwaste Building does not affect any equipment required to achieve and maintain safe shutdown.

A wet-pipe sprinkler system is provided throughout the radwaste handling portion of the Radwaste Building, to provide personnel protection, allow egress, and limit the spread of the fire.

A manual water spray system is provided internal to the charcoal filter, to provide property protection and limit the spread of the fire.

Although the Radwaste Building contains radiological materials, fire within any given fire area does not create a radiological release in excess of 10 CFR 20 limits.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Location of the manual suppression systems within stairwells and outside of rooms containing electrical components to avoid spray water damage to electrical components;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

Post-fire recovery for a design basis fire contained to a single Radwaste Building fire area would involve all the components (restoration and replenishment of fire protection equipment, forensic investigation, overhaul and salvage, demolition, reconstruction to original design, and testing of

restored systems to original requirements) typical of a major industrial fire, as well as the additional radiological, security access, and quality assurance controls unique to a nuclear plant. However, the resources needed to perform this restoration should be no more than that required for a major plant refueling outage. Redundancy provided in nonsafety-related systems allows quicker restoration of plant operation, even if at a reduced power level. The inclusion of equipment access paths and hatches for all areas of the Radwaste Building not only facilitates original plant construction but also major equipment replacement. Due to these factors, the potential for post-fire recovery for a design basis fire contained to a single Radwaste Building fire area is considered better than currently operating nuclear plants.

The following features minimize or mitigate the effect of naturally occurring hazards on fire protection within the Radwaste Building:

- Fire barriers are an integral part of the Radwaste Building, designed and installed as required by the IBC for applicable seismic, wind, and hydrodynamic conditions;
- Fire suppression system piping in the Radwaste Building is designed and installed to meet NFPA 13 seismic requirements (Table 9A.2-1); and
- Protection of the fire protection system in the Radwaste Building from design-basis storms, tornados, and floods is provided by the Radwaste Building structure itself.

9A.4.6 Electrical Building

As shown on the fire zone drawings (Figures 9A.2-25 through 9A.2-32), the Electrical Building is subdivided by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage to not more than one redundant train of nonsafety-related equipment. The Electrical Building does not contain safety-related or safe shutdown components as described in Table 9A6-1. Therefore, a fire in the Electrical Building does not affect the ability to achieve and maintain safe shutdown.

A fire within any of the fire areas associated with either standby diesel generator (SDG) is assumed to damage all components within the fire area resulting in loss of all function and consequential damage, including a spurious operation of any one component. Damage to the components in the fire area only affects the operation of one of the two nonsafety-related SDGs and does not affect the passive safe shutdown components or redundant nonsafety-related SDG or train of active components from performing their functions.

Curbs are provided at doorways and around equipment containing significant amount of oil, to prevent the spread of flammable liquids.

There are cable trays in the Technical Support Center. Cables consist of power cables in flexible metallic rigid steel conduit, fiber optic cables for the multiplexed information and instrumentation cables, and a few hard-wired control cables. There is a raised computer floor to allow distribution of the few cables via conduit (flex or rigid) or cable pathways. There is a suspended ceiling but only cables associated with nonsafety-related lighting, the fire alarm system, and communication. These cables are also in conduit.

Paper within the Technical Support Center is required to be stored in approved containers (cabinets, file cabinets, waste baskets) except when in use.

A wet-pipe sprinkler system is provided throughout the Technical Support Center Complex to provide personnel protection, allow egress, and limit the spread of the fire.

Wet-pipe sprinkler systems are provided throughout each of the cable spreading rooms, to provide personnel protection, allow egress, and limit the spread of the fire.

Preaction foam sprinkler systems are provided throughout each of the SDG rooms, to provide personnel protection, allow egress, and limit the spread of the fire.

Foam deluge systems are provided throughout each of the day tank rooms, to provide property protection and limit the spread of the fire.

Manual water spray systems are provided internal to each of the charcoal filters, to provide property protection and limit the spread of the fire.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Use of preaction type sprinkler systems, supervised with pressurized air and requiring multiple indications of fire prior to discharging water from sprinkler heads, over redundant or critical plant equipment such as diesel generators;
- Location of the manual suppression systems within stairwells and outside of rooms containing electrical components to avoid spray water damage to electrical components;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

Post-fire recovery for a design basis fire contained to a single Electrical Building fire area would involve all the components (restoration and replenishment of fire protection equipment, forensic investigation, overhaul and salvage, demolition, reconstruction to original design, and testing of restored systems to original requirements) typical of a major industrial fire, as well as the additional security access and quality assurance controls unique to a nuclear plant. However, the resources needed to perform this restoration should be no more than that required for a major plant refueling outage. Redundancy provided in nonsafety-related systems allows quicker restoration of plant operation, even if at a reduced power level. The inclusion of equipment access paths and hatches for all areas of the Electrical Building not only facilitates original plant construction but also major equipment replacement. Due to these factors, the potential for post-fire recovery for a design basis fire contained to a single Electrical Building fire area is considered better than currently operating nuclear plants.

The following features minimize or mitigate the effect of naturally occurring hazards on fire protection within the Electrical Building:

- Fire barriers are an integral part of the Electrical Building, designed and installed as required by the IBC for applicable seismic, wind, and hydrodynamic conditions;
- Fire suppression system piping in the Electrical Building is designed and installed to meet NFPA 13 seismic requirements (Table 9A.2-1); and

- Protection of the fire protection system in the Electrical Building from design-basis storms, tornados, and floods is provided by the Electrical Building structure itself.

9A.4.7 Yard

The yard loop provides fire water to all external portions of the plant, as well as various buildings in the plant. Only those portions of the Yard containing equipment associated with Turbine and Electrical Buildings are included at this time; the Combined License (COL) applicant shall include fire zone drawings for those portions of the Yard except for that associated with Turbine and Electrical Building equipment (COL 9A.7-1-A).

The Fire Pump Enclosure and Ancillary Diesel Building are supplied firewater by the primary fire protection system; however these building are only identified on the Yard drawing. Therefore, the FHA Tables and discussion are included in this Subsection.

This FHA includes an evaluation of the Pump House, Guard House, Hot Machine Shop, Service Water/Water Treatment Building (see Subsection 9A.4.9), Cold Machine Shop, Warehouse, Training Center, Service Building (see Subsection 9A.4.8), Fire Pump Enclosure (see Subsection 9A.4.11), Ancillary Diesel Building (see subsection 9A.4.10), Auxiliary Boiler Building, and Administration Building. A more detailed evaluation of the Service Water/Water Treatment Building, Service Building, and Yard will be added during the Combined Construction and Operating License (COL) application for a specific site (COL 9A.7-2-A).

As shown on Turbine Building and Electrical Building fire protection zone drawings (Figures 9A.2-13 and 9A.2-25) as well as Site fire protection zone plot plan (Figure 9A.2-33), the significant outdoor fire hazards are separated by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage to not more than one redundant train of nonsafety-related equipment. The Yard does not contain any safety-related or safe shutdown components, and as such, a fire in the Yard does not affect any of the four divisions used to achieve and maintain safe shutdown.

Foam deluge systems are provided on each fuel oil storage tank and the lube oil storage area, to provide property protection and limit the spread of fire.

Automatic deluge systems are provided on each Main, Unit Auxiliary, and Reserve Auxiliary transformer, to provide property protection and limit the spread of fire.

Wet-pipe sprinkler systems are provided throughout each of the cable tunnels, and the Administration Building, to provide personnel and property protection, allow egress, and limit the spread of the fire.

A dry-pipe sprinkler system is provided throughout the Warehouse, to provide personnel and property protection, allow egress, and limit the spread of the fire.

A preaction sprinkler system is provided throughout the Training Center, to provide personnel and property protection, allow egress, and limit the spread of the fire.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Use of preaction type sprinkler systems, supervised with pressurized air and requiring multiple indications of fire prior to discharging water from sprinkler heads, over redundant or critical plant equipment such as computer simulators;
- Provision of adequately sized flood containment boundaries to handle the suppression flow and prevent groundwater contamination; and
- Installation of electrical equipment above expected flood level heights.

Post-fire recovery for a design basis fire contained to a single Yard fire area would involve all the components (restoration and replenishment of fire protection equipment, forensic investigation, overhaul and salvage, demolition, reconstruction to original design, and testing of restored systems to original requirements) typical of a major industrial fire, as well as the additional security access and quality assurance controls unique to a nuclear plant. However, the resources needed to perform this restoration should be no more than that required for a major plant refueling outage. Redundancy provided in nonsafety-related systems allows quicker restoration of plant operation, even if at a reduced power level. The outdoor nature of equipment in the Yard facilitates not only original plant construction but also major equipment replacement. Due to these factors, the potential for post-fire recovery for a design basis fire contained to a single Yard fire area is considered better than currently operating nuclear plants.

The following features minimize or mitigate the effect of naturally occurring hazards on fire protection for the Yard:

- Fire barriers are an integral part of the buildings, designed and installed as required by the IBC for applicable seismic, wind, and hydrodynamic conditions;
- Outdoor fire barriers are designed and installed as required by the IBC for applicable seismic, wind, and hydrodynamic conditions;
- Fire suppression system piping in the buildings and in the Yard are designed and installed to meet NFPA 13 seismic requirements;
- Protection of the fire protection system in the buildings from design-basis storms, tornados, and floods are provided by the building structure itself;
- Outdoor electrical components in the fire protection system are weatherproof or protected against moisture intrusion;
- Dry-pipe systems are used for all outdoor fire protection piping;
- Outdoor piping, conduit, and components in the fire protection system have the required corrosion protection coatings;
- All outdoor fire protection piping and conduit are electrically grounded; and
- A Fire area separation is provided between Yard Buildings and the Nuclear and Turbine Islands in accordance with NFPA 804 Paragraph 8.9 as expanded on in NFPA 80A Section A 3.2.2 ("Recommended Practice for Protection of Buildings from Exterior Fire Exposures").

9A.4.8 Service Building

The Service Building does not contain any system or function that could affect the operation or shutdown of the reactor, nor does it contain any significant hazards. The Service Building does not contain any safety-related or safe shutdown components, and as such, a fire in the Service Building does not affect any of the four divisions used to achieve and maintain safe shutdown.

The basic fire protection features are presented in a method similar to that used for other buildings.

The Service Building is a Seismic Category II structure. It has controlled access tunnels to the Reactor Building, the Turbine Building, the Radwaste Building, and the Electrical Building. The exterior wall facing these buildings is a 3-hour barrier constructed of fire-resistive concrete. The controlled access doors in this wall are rated 3-hour fire resistive, Class A doors. Other exterior walls are constructed of concrete, or of gypsum board mounted on metal studs. The stairwells are required for personnel access and egress in the event of a fire and are protected with minimum 2-hour barriers in accordance with the Life Safety Code, NFPA 101.

Due to possible variations of the fire loading during operation, the facility is fully equipped with an automatic wet-pipe sprinkler system combined with standpipes, hose systems and portable extinguishers throughout its interior. The wet-pipe sprinkler system is designed for Light Hazard Occupancy, 4.2 L/min/m^2 (0.10 gpm/ft^2).

Fire detection is provided throughout the Service Building with the use of Class A supervised product-of-combustion detection systems. Alarms, both trouble and fire, report to the Main Control Room. Fire alarms are sounded throughout the Service Building. Manual fire alarm pull boxes are located at each fire hose and extinguisher stations.

Class ABC dry chemical portable fire extinguishers are provided on each floor of the facility, located at or near the hose stations and alarm pull boxes. Additional portable fire extinguishers are provided in various locations for convenience, or where increased human activity is anticipated.

Wall, floor, and ceiling penetrations for piping, HVAC, and cable trays are sealed where needed for HVAC control. However, fire dampers or stops are provided only where required for personnel protection, as the nature of the activities within the building, coupled with the complete sprinkler coverage, precludes the need to provide multiple fire areas within the Service Building.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Location of the manual suppression systems within stairwells and outside of rooms containing electrical components to avoid spray water damage to electrical components;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

The following features minimize or mitigate the effect of naturally occurring hazards on fire protection within the Service Building:

- Fire barriers are an integral part of the Service Building, designed and installed as required by the IBC for applicable seismic, wind, and hydrodynamic conditions;
- Fire suppression system piping in the Service Building is designed and installed to meet NFPA 13 seismic requirements (Table 9A.2-1); and
- Protection of the fire protection system in the Service Building from design-basis storms, tornados, and floods is provided by the Service Building structure itself.

9A.4.9 Service Water/Water Treatment Building

The Service Water/Water Treatment Building (SF/WT) does not contain any system or function that could affect the operation or shutdown of the reactor, nor does it contain any significant hazards. The SF/WT does not contain any safety-related or safe shutdown components, and as such, a fire in the SF/WT does not affect any of the four divisions used to achieve and maintain safe shutdown. However, the SF/WT is subdivided by 3-hour fire-rated concrete barriers to inhibit fire spread and to limit fire damage to not more than one redundant train of nonsafety-related Service Water equipment. The basic fire protection features are presented in a method similar to that used for other buildings.

The SF/WT is a non-seismic structure, and may be attached to the Cooling Towers. None of the walls or floors are required to be fire-rated, except where separating redundant components and per Life Safety Code, NFPA 101. Stairwells are required for personnel access and egress in the event of a fire and therefore are protected with minimum 2-hour barriers in accordance with the Life Safety Code, NFPA 101.

Fire detection is provided throughout the SF/WT with the use of Class A supervised product-of-combustion detection systems. Alarms, both trouble and fire, report to the Main Control Room.

Class ABC dry chemical portable fire extinguishers are provided on each floor of the facility, located at or near the hose stations and alarm pull boxes. Additional portable fire extinguishers are provided in various locations for convenience, or where increased human activity is anticipated.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Location of the manual suppression systems within stairwells and outside of rooms containing electrical components to avoid spray water damage to electrical components;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow; and
- Provisions for curbs around open hatches.

9A.4.10 Ancillary Diesel Building

The Ancillary Diesel Building (ADB) is a Seismic Category II structure that contains redundant Ancillary Diesel Generator equipment. This building does not contain any other systems or functions that could affect the operation or shutdown of the reactor. However, fuel oil storage

tanks for the Ancillary Diesel Generators are located within the ADB. The ADB does not contain any safety-related components, and as such, a fire in the ADB does not affect any of the four divisions used to achieve and maintain safe shutdown for 72 hours following a design bases accident.

A fire within any of the fire areas associated with either ancillary diesel generator is assumed to damage all components within the fire area resulting in loss of all function and consequential damage, including a spurious operation of any one component. Damage to the components in the fire area only affects the operation of one of the two nonsafety-related ancillary diesel generators and does not affect the passive safe shutdown components or redundant nonsafety-related ancillary diesel generator or train of active components from performing their functions.

Curbs are provided at doorways and around equipment containing significant amount of oil, to prevent the spread of flammable liquids.

Preaction foam sprinkler systems are provided throughout each of the ancillary diesel generator rooms, to provide personnel protection, allow egress, and limit the spread of the fire. Foam deluge systems are provided throughout each of the fuel oil tank rooms, to provide property protection and limit the spread of the fire. The basic fire protection features are presented in a method similar to that used for other buildings.

The ADB is a completely separate Seismic Category II structure. The exterior walls of this building are 3-hour barriers constructed of fire-resistive concrete. The controlled access doors in these walls are rated 3-hour fire-resistive, Class A doors. Other walls are constructed of concrete, or of gypsum board mounted on metal studs. The ADB is a one-story building.

Fire detection is provided throughout the ADB. Alarms, both trouble and fire, report to the Main Control Room. Manual fire alarm pull boxes are located at building exits.

Class ABC dry chemical portable fire extinguishers are provided for the facility, located at or near the hose stations and alarm pull boxes. Additional portable fire extinguishers are provided in various locations for convenience, or where increased human activity is anticipated.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Use the preaction type sprinkler systems, supervised with pressurized air and requiring multiple indications of fire prior to discharging water from sprinkler heads, over redundant or critical plant equipment such as diesel generators;
- Location of the manual suppression systems outside of rooms containing electrical components to avoid spray water damage to electrical components;
- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

The following features minimize or mitigate the effect of naturally occurring hazards on fire protection within the ADB:

- Fire barriers are an integral part of the ADB, designed and installed as required by the IBC for applicable seismic, wind, and hydrodynamic conditions;
- Fire suppression system piping in the ADB is designed and installed to meet NFPA 13 seismic requirements Table 9A.2-1); and
- Protection of the fire protection system in the ADB from design-basis storms, tornados, and floods is provided by the ADB structure itself.

The ADB HVAC System provides smoke removal for the Ancillary Diesel Building. The smoke removal mode of the ADB HVAC System provides smoke removal from the ADB engine rooms and ADB fuel oil storage tank rooms.

9A.4.11 Fire Pump Enclosure

The Fire Pump Enclosure is a Seismic Category I structure that contains the primary fire pumps and fuel oil tank. The fire pumps have RTNSS functions. This building does not contain any other systems or functions that could affect the operation or shutdown of the reactor, nor does it contain any significant hazards. However, fuel oil tanks for the Seismic Category I diesel fire pump are located within the Fire Pump Enclosure. The Fire Pump Enclosure does not contain any safety-related components, and as such, a fire in the Fire Pump Enclosure does not affect any of the four divisions used to bring the reactor to stable shutdown. However, the fire pumps are credited for maintaining stable shutdown and extinguishing fires.

A fire within any of the fire areas associated with either fire pump is assumed to damage all components within the fire area resulting in loss of all function and consequential damage, including a spurious operation of any one component. Damage to the components in the fire area only affects the operation of one of the two nonsafety-related fire pumps and does not affect the passive safe shutdown components or redundant nonsafety-related fire pump or train of active components from performing their functions.

Curbs are provided at doorways and around equipment containing significant amount of oil, to prevent the spread of flammable liquids.

Dry pilot foam water sprinkler systems are provided throughout each of the Fire Pump Enclosure rooms, to provide personnel protection, allow egress, and limit the spread of the fire. The basic fire protection features are presented in a method similar to that used for other buildings.

The Fire Pump Enclosure is a completely separate Seismic Category I structure. The exterior walls of this building are 3-hour barrier constructed of fire-resistive concrete. The controlled access doors in this wall are rated 3-hour fire-resistive, Class A doors. The Fire Pump Enclosure is a one-story building.

To prevent damage from inadvertent or careless operation, as well as rupture of the fire suppression system, the following design features are included:

- Use of dry pilot foam type sprinkler systems, supervised with pressurized air and requiring multiple indications of fire prior to discharging water from sprinkler heads, over redundant or critical plant equipment such as fire pumps;
- Location of the manual suppression systems outside of rooms containing electrical components to avoid spray water damage to electrical components;

- Provision of adequately sized floor drains, curbs, equipment bases, and flood containment boundaries to handle the suppression flow;
- Installation of electrical equipment above expected flood level heights; and
- Provisions for curbs around open hatches.

Fire protection within the Fire Pump Enclosure is not affected by naturally occurring hazards due to the following reasons:

- Fire barriers are an integral part of the Fire Pump Enclosure, designed and installed to withstand a Safe Shutdown Earthquake (SSE);
- Fire suppression system piping in the Fire Pump Enclosure is designed and installed to withstand an SSE and remain operational;
- Fire detection and alarm in the Fire Pump Enclosure is seismically mounted to not collapse;
- Repair or restoration of fire detection and alarm would only require replacement of individual failed components from stored spares; and
- Protection of the fire protection system in the Fire Pump Enclosure from design-basis storms, tornados, and floods is provided by the Fire Pump Enclosure structure itself.

9A.5 FIRE PROTECTION ANALYSES BY ROOM OR FIRE ZONE

Cumulative damage (property loss) and restoration from fire initiation and suppression activities, but excluding replacement power costs, is subjectively categorized as follows:

- Negligible: Less than $5,000
- Minor: Less than $50,000
- Moderate: Less than $2,000,000 (typical insurance deductible)
- Significant: Greater than $2,000,000

Cumulative plant operational effects from fire initiation and suppression activities are categorized as follows:

- None: No effect to any power production or plant equipment
- Power Reduction: Event could require or cause reduction in turbine output, due to reduced steam flow rate resulting from loss of some equipment
- Turbine Trip: Event could require or cause stopping turbine
- LOPP: Event could require or cause loss of all on-site power sources
- Reactor Scram: Event could require or cause operators to scram the reactor, achieve hot shutdown or stable shutdown condition, and continue to cold shutdown condition if necessary

The first four digits of a five-digit room number contain the following information: XXXX

Structure: 1 = Reactor Bldg
2 = Fuel Bldg
3 = Control Bldg
4 = Turbine Bldg
5 = Electrical Bldg
6 = Radwaste Bldg

7, 8, 9, 10 etc. = Other Bldgs

Floor Level within Bldg

Assigned to:
1 = Safety-Related Div 1
2 = Safety-Related Div 2
3 = Safety-Related Div 3
4 = Safety-Related Div 4
5 = Nonsafety-Related redundant A
6 = Nonsafety-Related redundant B
7 = Areas with multiple divisions or trains
8, 0 = other room types
9 = Nonsafety-Related vertical chases
P = pool

Fire area numbers correspond to the lowest major room within the fire area.

9A.5.1 Reactor Building

See Table 9A.5-1 for detailed fire hazards analysis of each fire area within the RB.

See Figures 9A.2-1 through 9A.2-11 for RB fire zone drawings.

9A.5.2 Fuel Building

See Table 9A.5-2 for detailed fire hazards analysis of each fire area within the FB.

See Figures 9A.2-1 through 9A.2-8 and Figure 9A.2-10 for FB fire zone drawings.

9A.5.3 Control Building

See Table 9A.5-3 for detailed fire hazards analysis of each fire area within the Control Building.

See Figures 9A.2-2 through 9A.2-5 and Figure 9A.2-11 for Control Building fire zone drawings.

9A.5.4 Turbine Building

See Table 9A.5-4 for detailed fire hazards analysis of each fire area within the Turbine Building.

See Figures 9A.2-12 through 9A.2-19 for Turbine Building fire drawings

9A.5.5 Radwaste Building

See Table 9A.5-5 for detailed fire hazards analysis of each fire area within the Radwaste Building.

See Figures 9A.2-20 through 9A.2-24 for Radwaste Building fire drawings.

9A.5.6 Electrical Building

See Table 9A.5-6 for detailed fire hazards analysis of each fire area within the Electrical Building.

See Figures 9A.2-25 through 9A.2-32 for Electrical Building fire drawings.

9A.5.7 Yard

See Table 9A.5-7 for detailed fire hazards analysis of each fire area for portions of the Yard. The remainder of the Yard is site specific and is designed by the COL applicant. The applicant will provide additional information (Reference Subsection 9A.4.7).

9A.5.8 Service Building

The Service Building is protected in accordance with applicable NFPA codes. The Service Building is site specific and is designed by the COL applicant. The applicant will provide additional information (Reference Subsection 9A.4.7).

9A.5.9 Service Water/Water Treatment Building

The SF/WT building is protected in accordance with applicable NFPA codes. This building contains redundant Service Water equipment. The SF/WT is site specific and is designed by the COL applicant. The applicant will provide additional information (Reference Subsection 9A.4.7).

9A.5.10 Ancillary Diesel Building

See Table 9A.5-7 for detailed fire hazards analysis of each fire area within the ADB.

See Figures 9A.2-33 for ADB location.

9A.5.11 Fire Pump Enclosure

See Table 9A.5-7 for detailed fire hazards analysis of each fire area within the Fire Pump Enclosure.

See Figures 9A.2-33 for Fire Pump Enclosure location

Table 9A.5-1

Reactor Building

Fire Area:	**F1104**	Description:	**Elevator A**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**none**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4		Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500 **-6400** **-1000** **4650**	**1104**	**Cable insulation** **Electrical equipment** **Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside Elev at each landing)**	**CO2 fire extinguisher (outside room)**	**Hose racks (in nearby stairwell)**
9060	**1291**				**ABC fire extinguishers (outside Elev at each landing)**	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and hoistway doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1105**	Description:	**Elevator C**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**none**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4		Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1105**	**Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside Elev at each landing)**	**CO2 fire extinguisher (outside room)**	**Hose racks (in nearby stairwell)**
-6400 **-1000** **4650** **9060**	**1292**	**Cable insulation** **Electrical equipment**			**ABC fire extinguishers (outside Elev at each landing)**	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and hoistway doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1110**	Description:	**HCU A**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**1**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**A**
9A.2-10		Surrounded by fire barriers rated at:	**3 hours**
9A.2-11		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1110**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks (in nearby stairwell)**	**ABC fire extinguishers**
-9100						
-6400						
-1000	**1312**					

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train A and Division I safe shutdown equipment and circuits, as well as loss of redundant Division I and II HCU solenoid circuits; if HCUs are unavailable for reactor scram, either FMCRD portion of CRD system or SLC system can be used to scram reactor (components and circuits for either are located outside this Fire Area); for other systems, remaining three divisions of safe shutdown and redundant train B are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1120**	Description:	**HCU C**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-1** **9A.2-2** **9A.2-3**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**2**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1107**	**Class A combustibles** **Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks (in nearby stairwell)**	**ABC fire extinguishers**
-11500	**1120**	**Cable insulation**				
-9100						
-6400						
-1000	**1322**					

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train B and Division II safe shutdown equipment and circuits, as well as loss of redundant Division I and II HCU solenoid circuits; if HCUs are unavailable for reactor scram, either FMCRD portion of CRD system or SLC system can be used to scram reactor (components and circuits for either are located outside this Fire Area); for other systems, remaining three divisions of safe shutdown and redundant train A are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1130**	Description:	**HCU B**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**3**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**A**
9A.2-10		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1130**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell**	**Hose racks (in nearby stairwell)**	**ABC fire extinguishers**
-9100						
-6400						
-1000	**1332**					

< 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not
700	Unsprinklered combustible load limit, M	function, impact of design basis fire on safe shutdown:

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train A and Division III safe shutdown equipment and circuits, as well as loss of redundant Division I and II HCU solenoid circuits; if HCUs are unavailable for reactor scram, either FMCRD portion of CRD system or SLC system can be used to scram reactor (components and circuits for either are located outside this Fire Area); for other systems, remaining three divisions of safe shutdown and redundant train B are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1140**	Description:	**HCU D**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**4**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**B**
9A.2-11		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1140**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks (in nearby stairwell)**	**ABC fire extinguishers**
-9100						
-6400						
-1000	**1342**					

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train B and Division IV safe shutdown equipment and circuits, as well as loss of redundant Division I and II HCU solenoid circuits; if HCUs are unavailable for reactor scram, either FMCRD portion of CRD system or SLC system can be used to scram reactor (components and circuits for either are located outside this Fire Area); for other systems, remaining three divisions of safe shutdown and redundant train A are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1150	Description:	NE quadrant
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1	9A.2-6	Electrical classification:	none
9A.2-2	9A.2-7	Safety-related divisional equipment or cables:	1
9A.2-3	9A.2-8	Nonsafety-related redundant trains or equipment or cables:	A
9A.2-4	9A.2-10	Surrounded by fire barriers rated at:	3 hours
9A.2-5	9A.2-11	Except:	basemat (non-rated); elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	1100	Electrical equipment Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	Hose racks (in nearby stairwells)	CO2 fire extinguishers, ABC fire extinguishers
	1150, 1151	Class IIIB lubricants Cable insulation				ABC fire extinguishers
-6400	1250, 1293					
-1000	1300, 1304, 1293					
4650	1400 below floor 1293	Cable insulation				
5050	1400	Cable insulation Electrical equipment			CO2 fire extinguishers	Hose racks (in nearby stairwells)
9060	1500, 1293					
13570 17500 27000	1293					

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1150 (continued)**	Description:	**NE quadrant**
< 700 EL 4650 & below; < 1400 EL 5050 & above		Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700 EL 4650 & below; 1400 EL 5050 & above		Unsprinklered combustible load limit, MJ/m2	
Assuming operation of installed fire extinguishing equipment, impact of fire upon:			**Complete burnout of all equipment and cables within this Fire Area results in loss of only Division I shutdown equipment and circuits, as well as loss of redundant train A; remaining three divisions of safe shutdown and redundant train B are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Both A and B nonsafety-related on-site power sources are unaffected by fire and are operable.**
Plant operation:	**Reactor scram**		
Radiological release:	**Contained within building**		
Life safety:	**Travel distance limits to EXITs meet NFPA 101**		
Manual firefighting:	**Access via stairwells**		
Property loss:	**Moderate**		

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1152	Description:	SE quadrant
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1	9A.2-6	Electrical classification:	none
9A.2-2	9A.2-7	Safety-related divisional equipment or cables:	3
9A.2-3	9A.2-8	Nonsafety-related redundant trains or equipment or cables:	A
9A.2-4	9A.2-10	Surrounded by fire barriers rated at:	3 hours
9A.2-5		Except:	basemat (non-rated); elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	1101, 1106 1152	Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	Hose racks (in nearby stairwells)	ABC fire extinguishers
	1153		Area-wide photoelectric			
-6400	1204, 1294		Area-wide ionization			
-1000	1301, 1306, 1294					
4650	1401 below floor 1294	Cable insulation				
5050	1401	Cable insulation			CO2 fire extinguishers	Hose racks (in nearby
9060	1501, 1294	Electrical equipment				
13570 17500 27000	1294					

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1152 (continued)**	Description:	**SE quadrant**
< 700 EL 4650 & below; < 1400 EL 5050 & above		Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700 EL 4650 & below; 1400 EL 5050 & above		Unsprinklered combustible load limit, MJ	

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Complete burnout of all equipment and cables within this Fire Area results in loss of only Division III shutdown equipment and circuits, as well as loss of redundant train A; remaining three divisions of safe shutdown and redundant train B are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Both A and B nonsafety-related on-site power sources are unaffected by fire and are operable.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1160	Description:	NW quadrant
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1	9A.2-6	Electrical classification:	none
9A.2-2	9A.2-7	Safety-related divisional equipment or cables:	4
9A.2-3	9A.2-8	Nonsafety-related redundant trains or equipment or cables:	B
9A.2-4	9A.2-10	Surrounded by fire barriers rated at:	3 hours
9A.2-5	9A.2-11	Except:	basemat (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	1103	Electrical equipment Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	Hose racks (in nearby stairwells)	CO2 fire extinguishers, ABC fire extinguishers
	1160, 1161	Class IIIB lubricants Cable insulation				ABC fire extinguishers
-6400	1260 1296					
-1000	1303, 1305, 1296					
4650	1403 below floor 1296	Cable insulation				
5050	1403	Cable insulation Electrical equipment			CO2 fire extinguishers	Hose racks (in nearby stairwells)
9060	1503, 1296					
13570 17500 27000	1296					

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1160 (continued)**	Description:	**NW quadrant**
< 700 EL 4650 & below; < 1400 EL 5050 & above		Anticipated combustible load, MJ/m2	
700 EL 4650 & below; 1400 EL 5050 & above		Unsprinklered combustible load limit, MJ/m2	

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Division 4 shutdown equipment and circuits, as well as loss of redundant train B; remaining three divisions of safe shutdown and redundant train A are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Both A and B nonsafety-related on-site power sources are unaffected by fire and are operable.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1162	Description:	SW quadrant
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1	9A.2-6	Electrical classification:	none
9A.2-2	9A.2-7	Safety-related divisional equipment or cables:	2
9A.2-3	9A.2-8	Nonsafety-related redundant trains or equipment or cables:	B
9A.2-4	9A.2-9	Surrounded by fire barriers rated at:	3 hours
9A.2-5		Except:	basemat (non-rated); elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	1102 1162	Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	Hose racks (in nearby stairwells)	ABC fire extinguishers
	1163		Area-wide photoelectric			
-6400	1295		Area-wide ionization			
-1000						
4650	1402 below floor 1295	Cable insulation				
5050	1402	Cable insulation			CO2 fire extinguishers	Hose racks (in nearby stairwells)
9060	1502, 1295	Electrical equipment				
13570 17500 27000	1295					

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1162 (continued)**	Description:	**SW quadrant**
< 700 EL 4650 & below; < 1400 EL 5050 & above		Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700 EL 4650 & below; 1400 EL 5050 & above		Unsprinklered combustible load limit, MJ/m2	
Assuming operation of installed fire extinguishing equipment, impact of fire upon:			**Complete burnout of all equipment and cables within this Fire Area results in loss of only Division 2 shutdown equipment and circuits, as well as loss of redundant train B; remaining three divisions of safe shutdown and redundant train A are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Both A and B nonsafety-related on-site power sources are unaffected by fire and are operable.**
Plant operation:	**Reactor scram**		
Radiological release:	**Contained within building**		
Life safety:	**Travel distance limits to EXITs meet NFPA 101**		
Manual firefighting:	**Access via stairwells**		
Property loss:	**Moderate**		

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1170	Description:	Drywell and Containment
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1	9A.2-6	Electrical classification:	none
9A.2-2	9A.2-7	Safety-related divisional equipment or cables:	1, 2, 3, 4
9A.2-3	9A.2-8	Nonsafety-related redundant trains or equipment or cables:	A, B
9A.2-4	9A.2-10	Surrounded by fire barriers rated at:	3 hours
9A.2-5	9A.2-11	Except:	basemat (non-rated), including basaltic concrete

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibl	Primary	Backup	Primary	Backup
-8800	1170	Class IIIB lubricants Cable insulation Filter media	None	Portable fire detection used as needed during outage activities	Inerted environment during power operation	Hose racks and ABC fire extinguishers (via hatches at EL -6400, EL 13570 and EL 17500) (extra fire hose and fire extinguishers staged at hatches as required)
-6400	1170, 1206					
-1000	1170					
4650	14P0, 1170					
9060	14 P0, 1570, 1170					
13570	1170, 1570, 14P0					
17500	17P0, 17P1, 17P2, 1570	None				
27000	18P3A, 18P3B, 18P4A, 18P4B, 18P4C, 18P5A, 18P5B, 18P5C 18P3C, 18P3D, 18P4D, 18P4E, 18P4F, 18P6A, 18P6B, 18P6C, 1871, 1872					

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1170 (continued)**	Description:	**Drywell and Containment**
	< 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
	700	Unsprinklered combustible load limit, MJ/m2	**During plant operation, this entire Fire Area is inerted by nitrogen and will not support combustion. When not inerted (during shutdowns and outages), complete burnout of all equipment and cables within this Fire Area is prevented by limited amount of combustibles and spatial separation between redundant divisional circuits to ensure that no more that two divisions of safe shutdown equipment will be affected by a single fire. See also section 9A.6.**

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram; outage required to restore**
Radiological release:	**Contained within containment structure**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via hatches**
Property loss:	**Significant**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1190**	Description:	**Stairwell A**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1	**9A.2-6**	Electrical classification:	**none**
9A.2-2	**9A.2-7**	Safety-related divisional equipment or cables:	**none**
9A.2-3	**9A.2-8**	Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4	**9A.2-9**	Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1190**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-6400						
-1000						
4650						
9060						
13570	**1690**					
17500						
27000						
34000						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1191**	Description:	**Stairwell B**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1	**9A.2-6**	Electrical classification:	**none**
9A.2-2	**9A.2-7**	Safety-related divisional equipment or cables:	**none**
9A.2-3	**9A.2-8**	Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4	**9A.2-9**	Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1191**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-6400						
-1000						
4650						
9060						
13570						
17500						
27000						
34000						
37000						

negligible	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700	Unsprinklered combustible load limit, MJ/m2	

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1192**	Description:	**Stairwell C**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1	**9A.2-6**	Electrical classification:	**none**
9A.2-2	**9A.2-7**	Safety-related divisional equipment or cables:	**none**
9A.2-3	**9A.2-8**	Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4	**9A.2-9**	Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1192**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-6400						
-1000						
4650						
9060						
13570	**1691**					
17500						
27000						
34000						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1193**	Description:	**Stairwell D**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1	**9A.2-6**	Electrical classification:	**none**
9A.2-2	**9A.2-7**	Safety-related divisional equipment or cables:	**none**
9A.2-3	**9A.2-8**	Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4	**9A.2-9**	Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1193**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-6400						
-1000						
4650						
9060						
13570						
17500						
27000						
34000						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1194	Description:	Elevator B
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1	9A.2-6	Electrical classification:	none
9A.2-2	9A.2-7	Safety-related divisional equipment or cables:	none
9A.2-3	9A.2-8	Nonsafety-related redundant trains or equipment or cables:	none
9A.2-4	9A.2-9	Surrounded by fire barriers rated at:	3 hours
9A.2-5		Except:	basemat (non-rated); elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	1194	Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside Elev at each landing)	ABC fire extinguishers	Hose racks (in nearby stairwell)
-6400						
-1000						
4650						
9060						
13570						
17500						
27000						
34000						
37000	1980	Electrical equipment			CO2 fire extinguisher (outside room)	

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1194 (continued)**	Description:	**Elevator B**
	< 700	Anticipated combustible load, MJ/m2	
	700	Unsprinklered combustible load limit, MJ/m2	

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and hoistway doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1195**	Description:	**Interior Stairwell A**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**none**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-10		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11200	**1195**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-9100						
-6400						
-1000						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1196**	Description:	**Interior Stairwell B**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-1** **9A.2-2**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11200 **-9100**	**1196**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1197**	Description:	**Interior Stairwell C**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-1** **9A.2-2**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11200 **-6400**	**1197**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1198**	Description:	**Interior Stairwell D**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-1** **9A.2-2**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11200 **-9100** **-6400**	**1198**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior doors**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1203	Description:	CRD and Containment Access
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804
DCD Fig:	9A.2-2 9A.2-3 9A.2-10	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	2
		Nonsafety-related redundant trains or equipment or cables:	A, B
		Surrounded by fire barriers rated at:	3 hours
		Except:	none

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-6400	1203	Class IIIB lubricants Cable insulation	Cross-zoned ionization and spot heat	Suppression flowswitch	Preaction sprinkler 12.2 L/min per m2 over entire area	Hose racks (in nearby stairwells)
-1000	1302, 1308	Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside stairwells at each landing)	Hose racks (in nearby stairwells)	ABC fire extinguishers
	1307	Electical equipment Class IIIB lubricants Cable insulation				CO2 fire extinguishers, ABC fire extinguishers

> 700 (room 1203)	Anticipated combustible load, MJ/m2
< 700 (other rooms)	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects redundant nonsafety-related CRD pumps A and B, but does not affect any safety-related equipment; all safety divisions and both A and B nonsafety-related on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	Reactor scram; outage required to restore
Radiological release:	Contained within building
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells
Property loss:	Moderate

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1210**	Description:	**Division I Battery**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-10** **9A.2-11**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**1**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
-6400	**1210**	**29,810 L of battery acid** **Battery cell cases** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwell and interior doors**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division I equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Battery exhaust fans are alarmed to MCR.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1220**	Description:	**Division 2 Battery**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**2**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
-6400	**1220**	**29,810 L of battery acid Battery cell cases Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division 2 equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Battery exhaust fans are alarmed to MCR.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwell and interior doors**
Property loss:	**Moderate**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1230**	Description:	**Division 3 Battery**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-10**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**3**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
-6400	**1230**	**29,810 L of battery acid** **Battery cell cases** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwell and interior doors**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division 3 equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Battery exhaust fans are alarmed to MCR.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1240**	Description:	**Division 4 Battery**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-11**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**4**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
-6400	**1240**	**29,810 L of battery acid** **Battery cell cases** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwell and interior doors**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division 4 equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable. Battery exhaust fans are alarmed to MCR.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1262**	Description:	**B Demineralizers**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-6400	**1261** **1262**	**Class IIIB lubricants** **Cable insulation**	**Area-wide ionization**	**Process indication**	**Hose racks at stairwells (via hatches at EL -1000)**	**ABC fire extinguishers (at EL -1000)**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to Exits meet NFPA 101**
Manual firefighting:	**Limited access via hatches**
Property loss:	**Minor**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train B equipment; all safety divisions and train A equipment are unaffected by fire and are operable. Both A and B on site power sources are unaffected by fire and are operable.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1311	Description:	Division 1 Electrical
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-2	9A.2-6	Electrical classification:	none
9A.2-3	9A.2-7	Safety-related divisional equipment or cables:	1
9A.2-4	9A.2-10	Nonsafety-related redundant trains or equipment or cables:	none
9A.2-5	9A.2-11	Surrounded by fire barriers rated at:	3 hours
		Except:	elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-6400	1211	Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	CO2 fire extinguishers	Hose racks at stairwells
-1000	1211 1311 1313	Electrical equipment Cable insulation				
4650	1211					
9060						
13570	1610, 1211					
17500	1711					
	1700, 1712 1713	Cable insulation Class IIIB lubricants			ABC fire extinguishers	
	1710	Electical equipment Cable insulation Class IIIB lubricants			ABC fire extinguishers, CO2 fire extinguishers	

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division 1 equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwell and interior doors
Property loss:	Significant

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1321	Description:	Division 2 Electrical
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-2, 9A.2-6		Electrical classification:	none
9A.2-3, 9A.2-7		Safety-related divisional equipment or cables:	2
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	none
9A.2-5		Surrounded by fire barriers rated at:	3 hours
		Except:	elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-6400	1221	Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	CO2 fire extinguishers	Hose racks at stairwells
-1000	1321, 1323	Electrical equipment				
	1221	Cable insulation				
4650	1221					
9060						
13570	1620, 1221					
17500	1721, 1221					
	1720	Cable insulation			ABC fire extinguishers	
	1722	Class IIIB lubricants				
	1723					

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwell and interior doors
Property loss:	Significant

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division 2 equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1331	Description:	Division 3 Electrical
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-2, 9A.2-6		Electrical classification:	none
9A.2-3, 9A.2-7		Safety-related divisional equipment or cables:	3
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	none
9A.2-5		Surrounded by fire barriers rated at:	3 hours
		Except:	elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-6400	1231	Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	CO2 fire extinguishers	Hose racks at stairwells
-1000	1331, 1231	Electrical equipment				
4650	1231	Cable insulation				
9060						
13570	1630, 1231					
17500	1731, 1231					
	1703 1730 1732	Cable insulation Class IIIB lubricants			ABC fire extinguishers	

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division 3 equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwell and interior doors
Property loss:	Significant

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1341	Description:	Division 4 Electrical
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-2, 9A.2-6		Electrical classification:	none
9A.2-3, 9A.2-7		Safety-related divisional equipment or cables:	4
9A.2-4, 9A.2-11		Nonsafety-related redundant trains or equipment or cables:	none
9A.2-5		Surrounded by fire barriers rated at:	3 hours
		Except:	none

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-6400	1241	Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	CO2 fire extinguishers	Hose racks at stairwells
-1000	1341, 1241	Electrical equipment Cable insulation				
4650	1241					
9060						
13570	1640, 1241					
17500	1741, 1241					
	1701, 1742	Cable insulation Class IIIB lubricants			ABC fire extinguishers	
	1740	Electrical equipment Cable insulation Class IIIB lubricants			ABC fire extinguishers, CO2 fire extinguishers	

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Safety Division 4 equipment; remaining three safety divisions and both redundant A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwell and interior doors
Property loss:	Significant

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1450	Description:	H_2 Calibration Gas Skid Room A
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804
DCD Fig:	9A.2-4	Building code occupancy classification:	F-1
		Electrical classification:	Group B Class 1 Div 2
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	A
		Surrounded by fire barriers rated at:	3 hours
		Except:	basemat (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	1450	Electrical equipment Cable insulation 16 m3 Hydrogen	Area-wide spot heat	Manual pull (outside room)	ABC fire extinguisher	Hydrant

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A equipment and no safety-related equipment; all safety divisions and redundant train B are operable. Both A and B on-site power sources are unaffected by fire and are operable. Potential for hydrogen buildup is mitigated by louvers in the top and bottom of the 3-hr fire rated exterior wall. Ignition within is prevented by requiring all electrical devices to be rated NEC Group B Class I Division II. In the event of an ignition and explosion, damage to the Reactor Building or Control Building is prevented by 3-hr fire rated reinforced concrete walls that are approximately 1.5 meters thick for the nearby Reactor Building and approximately 0.7 meters thick for the Control Building which is further away. Damage to the redundant hydrogen systems is prevented by physically separating them by over 50 meters and surrounding each by 3-hr fire rated concrete walls, including penetration seals and doors.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via door
Property loss:	Minor

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1460	Description:	H_2 Calibration Gas Skid Room B
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804
DCD Fig:	9A.2-4	Building code occupancy classification:	F-1
		Electrical classification:	Group B Class 1 Div 2
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	B
		Surrounded by fire barriers rated at:	3 hours
		Except:	basemat

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	1460	Electrical equipment Cable insulation 16 m3 Hydrogen	Area-wide spot heat	Manual pull (outside room)	ABC fire extinguisher	Hydrant

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B equipment and no safety-related equipment; all safety divisions and redundant train A are operable. Both A and B on-site power sources are unaffected by fire and are operable. Potential for hydrogen buildup is mitigated by louvers in the top and bottom of the 3-hr fire rated exterior wall. Ignition within is prevented by requiring all electrical devices to be rated NEC Group B Class I Division II. In the event of an ignition and explosion, damage to the Reactor Building or Control Building is prevented by 3-hr fire rated reinforced concrete walls that are approximately 1.5 meters thick for the nearby Reactor Building and approximately 0.7 meters thick for the Control Building which is further away. Damage to the redundant hydrogen systems is prevented by physically separating them by over 50 meters and surrounding each by 3-hr fire rated concrete walls, including penetration seals and doors.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via door
Property loss:	Minor

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1480**	Description:	**Vestibule 1480**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804**
DCD Fig:	**9A.2-4** **9A.2-10**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3-hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**1480**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pull (outside room)**	**CO2 fire extinguisher**	**Hose racks in nearby stairwells**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B equipment and no safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1481**	Description:	**Vestibule 1481**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804**
DCD Fig:	**9A.2-4**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3-hours**
		Except:	**basemat(non-rated)**

Consisting of the following Rooms:

EL	Room #	Potential Combustibles	Fire Detection Primary	Fire Detection Backup	Fire Suppression Primary	Fire Suppression Backup
4650	**1481**	**Electrical equipment Cable insulation**	**Area-wide ionization**	**Manual pull (outside room)**	**CO2 fire extinguisher**	**Hose racks in nearby stairwells**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A equipment and no safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1580**	Description:	**Vestibule 1580**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804**
DCD Fig:	**9A.2-5** **9A.2-10**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9060	**1580**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pull (outside room)**	**CO2 fire extinguisher**	**Hose racks in nearby stairwells**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A and B equipment and no safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1581**	Description:	**Vestibule 1581**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804**
DCD Fig:	**9A.2-5** **9A.2-10**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9060	**1581**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pull (outside room)**	**CO2 fire extinguisher**	**Hose racks in nearby stairwells**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A and B equipment and no safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1600**	Description:	**Reactor Building HVAC Fan / Filter Room A**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-6	**9A.2-11**	Electrical classification:	**none**
9A.2-8		Safety-related divisional equipment or cables:	**none**
9A.2-9		Nonsafety-related redundant trains or equipment or cables:	**A**
9A.2-10		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
13570	**1600**	**Class IIIB lubricants Electrical equipment Cable insulation**	**Area-wide linear heat**	**Manual pulls (outside stairwell at each landing)**	**Hose racks at stairwells**	**ABC fire extinguishers**
27000	**17P3, 18P0, 18P1, 18P2**	**None**				
34000	**17P3, 18P2, 1294, 1900, 1903, 1904, 1905, 1906**	**Transient combustibles Electrical equipment Cable insulation Class A combustibles Filter media**	**Area-wide ionization**			
	above ceiling **1905, 1906**	**Cable insulation**				
	1901, 1902, 1907 1908, 18P0, 17P3, 18P1	**None**				

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1600 (continued)**	Description:	**Reactor Building HVAC Fan / Filter Room A**
	< 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
	700	Unsprinklered combustible load limit, MJ/m2	
Assuming operation of installed fire extinguishing equipment, impact of fire upon:			**Complete burnout of all equipment and cables within this Fire Area affects only redundant train A and B equipment, but does not affect any safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.**
Plant operation:	**None; restoration required before refueling**		
Radiological release:	**Contained within building**		
Life safety:	**Travel distance limits to EXITs meet NFPA 101**		
Manual firefighting:	**Access via stairwells**		
Property loss:	**Moderate**		

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1601**	Description:	**Reactor Building HVAC Fan / Filter Room B**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-4	**9A.2-8**	Electrical classification:	**none**
9A.2-5	**9A.2-9**	Safety-related divisional equipment or cables:	**none**
9A.2-6	**9A.2-11**	Nonsafety-related redundant trains or equipment or cables:	**B**
9A.2-7		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**driveway (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**1490** fuel grapple test pit	**Transient combustibles**	**Area-wide linear heat**	**Manual pulls (outside stairwell at each landing)**	**Hose racks at stairwells**	**ABC fire extinguishers**
9060						
13570		**Class IIIB lubricants Electrical equipment Cable insulation**				
17500	**17P3, 1490**	**None**				
27000	**1490**					
34000	**1490**					

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1601 (continued)**	Description:	**Reactor Building HVAC Fan / Filter Room B**
	< 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
	700	Unsprinklered combustible load limit, MJ/m2	**Complete burnout of all equipment and cables within this Fire Area affects only redundant train A and B equipment, but does not affect any safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.**

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; restoration required before refueling**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1680**	Description:	**Vestibule 1680**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804**
DCD Fig:	**9A.2-6** **9A.2-10**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A, B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
13570	**1680**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pull (outside room)**	**CO2 fire extinguisher**	**Hose racks in nearby stairwells**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A and B equipment and no safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1681**	Description:	**Vestibule 1681**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 101, 497, 804**
DCD Fig:	**9A.2-6** **9A.2-10**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A, B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
13570	**1681**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pull (outside room)**	**CO2 fire extinguisher**	**Hose racks in nearby stairwells**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A and B equipment and no safety-related equipment; all safety divisions are unaffected by a fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	**F1770**	Description:	**Main Steam Tunnel**
Building:	**Reactor & Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-7**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**1, 2, 3, 4**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**north side (water curtain sprinklers in F4100)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
17500	**1770**	**Class IIIB lubricants Cable insulation**	**Area-wide linear heat**	**Manual pulls (outside stairwell at each landing)**	**Hose racks at stairwells**	**ABC fire extinguishers at access doors**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of Division I, II, III, and IV containment isolation instrumentation; containment isolation is maintained by inboard MSIVs, outside of this Fire Area. No safe shutdown functions are affected by this fire; all other safety-related equipment and both redundant train A and B equipment are unaffected by the fire and are operable. See also section 9A.6.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Reactor scram; turbine trip; outage required to restore**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior doors**
Property loss:	**Moderate**

Table 9A.5-1

Reactor Building (Cont.)

Fire Area:	**F1890**	Description:	**Non Divisional Commodity Chase B**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:	**9A.2-8** **9A.2-9**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
27000 **34000**	**1294**	**Cable insulation** **Electrical equipment**	**Area-wide ionization**	**Manual pulls (outside Elev at each landing)**	**CO2 fire extinguisher (outside chase)**	**Hose racks (in nearby stairwell)**
					ABC fire extinguishers (outside Elev at each landing)	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable. This fire area provides separation of Non Divisional Commodity Chase B between elevations 24600 (bottom of concrete for elevation 27000) and elevation 34000 to provide upper and lower portions of the chase.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Negligible**

Table 9A.5-1
Reactor Building (Cont.)

Fire Area:	F1891	Description:	Non Divisional Commodity Chase C
Building:	Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:	9A.2-8 9A.2-9	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		Except:	none

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
27000 34000	1295	Cable insulation Electrical equipment	Area-wide ionization	Manual pulls (outside Elev at each landing)	CO2 fire extinguisher (outside chase)	Hose racks (in nearby stairwell)
					ABC fire extinguishers (outside Elev at each landing)	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related equipment; all safety divisions and both redundant trains A and B are operable. This fire area provides separation of Non Divisional Commodity Chase C between elevations 24600 (bottom of concrete for elevation 27000) and elevation 34000 to provide upper and lower portions of the chase.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	Contained within building
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells
Property loss:	Negligible

Table 9A.5-2

Fuel Building

Fire Area:	F2100	Description:	New and Spent Fuel Handling
Buildings:	Fuel & Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1, 9A.2-5		Electrical classification:	none
9A.2-2, 9A.2-6		Safety-related divisional equipment or cables:	1, 2, 3, 4
9A.2-3, 9A.2-10		Nonsafety-related redundant trains or equipment or cables:	A, B
9A.2-4		Surrounded by fire barriers rated at:	3 hours
		Except:	basemat (non-rated); elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	2101	Class IIIB lubricants Cable insulation	Area-wide photoelectric Area-wide ionization	Manual pulls (outside stairwell at each landing)	Hose racks (in nearby stairwells)	ABC fire extinguishers
	2100, 2150, 2151 2160, 2161 2102, 2190, 2191					
	21P0, 21P1, 21P2	None				
-6400	2200, 2201, 2202, 2251, 2261	Class IIIB lubricants Cable insulation Electrical equipment	Area-wide ionization			
	21P0, 21P1, 21P2, 2190, 2191	none				
-1000	2300, 2301, 2302, 2190, 2191, 21P0, 21P1, 21P2	Class IIIB lubricants Cable insulation Electrical equipment				
4650	2400	Class IIIB lubricants Cable insulation Transient combustibles Class A combustibles	Area-wide linear heat			
	2401, 2302, 21P2, 21P1, 21P0, 2190	none				

Table 9A.5-2
Fuel Building (Cont)

		Fire Area:	F2100 (continued)	Description:	New and Spent Fuel Handling	
		Buildings:	Fuel & Reactor	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804	
9060	2400			Manual Pulls		
13570		Class IIIB lubricants Cable insulation Transient combustibles Class A combustibles		(outside stairwell at each landing)	Hose racks (in nearby stairwells)	ABC fire extinguishers

< 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700	Unsprinklered combustible load limit, MJ/m2	

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None; restoration required before refueling
Radiological release:	Contained within building
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells
Property loss:	Moderate

Complete burnout of all equipment and cables within this Fire Area results in loss of DIV 1, 2, 3 and 4 Process Radiation Monitor instrumentation resulting in shutdown of HVAC and isolation of Fuel Building. Loss of redundant train A and B FAPCS equipment will result in loss of FAPCS. Makeup water capability to the Spent Fuel Pool from the FP system is unaffected by fire and is operable. Both A and B on-site power sources are unaffected by fire and are operable.

Table 9A.5-2
Fuel Building (Cont.)

Fire Area:	**F2192**	Description:	**Elevator A**
Building:	**Fuel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**none**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4		Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500 -6400 -1000 4650	**2192**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls (outside Elev at each landing)**	**ABC fire extinguishers (outside Elev at each landing)**	**Hose racks (in nearby stairwell)**
9060	**2500**	**Class IIIB lubricants Cable insulation Electrical equipment**			**CO2 fire extinguisher (outside room)**	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwell and hoistway doors**
Property loss:	**Negligible**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-2
Fuel Building (Cont.)

Fire Area:	**F2193**	Description:	**Stairwell A**
Building:	**Fuel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-1	**9A.2-5**	Electrical classification:	**none**
9A.2-2	**9A.2-6**	Safety-related divisional equipment or cables:	**none**
9A.2-3	**9A.2-7**	Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-4		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**2193**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-6400						
-1000						
4850						
9060						
17500						
22700						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-2
Fuel Building (Cont.)

Fire Area:	**F2490**	Description:	**Stairwell B**
Building:	**Fuel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-4		Electrical classification:	**none**
9A.2-5		Safety-related divisional equipment or cables:	**none**
9A.2-6		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-7		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**2490**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
9060						
13570						
22500						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior door**
Property loss:	**Negligible**

Table 9A.5-2
Fuel Building (Cont.)

Fire Area:	**F2600**	Description:	**HVAC Penthouse A**
Building:	**Fuel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:	**9A.2-7** **9A.2-10**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
22500	**2600**	**Class IIIB lubricants** **Cable insulation** **Filter media**	**Area-wide ionization**	**Manual pulls (outside stairwells)**	**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train A; all safety-related or safe shutdown and redundant train B equipment is unaffected by fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; restoration required before refueling**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-2
Fuel Building (Cont.)

Fire Area:	F2601	Description:	HVAC Penthouse B
Building:	Fuel	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-1	9A.2-5	Electrical classification:	none
9A.2-2	9A.2-6	Safety-related divisional equipment or cables:	none
9A.2-3	9A.2-7	Nonsafety-related redundant trains or equipment or cables:	B
9A.2-4	9A.2-10	Surrounded by fire barriers rated at:	3 hours
		Except:	basemat (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	2194	Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each landing)	Hose racks	ABC fire extinguishers
-6400						
-1000						
4650						
9060						
13570						
22700	2601 2194	Class IIIB lubricants Cable insulation Filter media				

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train B; all safety-related or safe shutdown and redundant train A equipment is unaffected by fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None; restoration required before refueling
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells
Property loss:	Moderate

Table 9A.5-3

Control Building

Fire Area:	**F3100**	Description:	**Corridor A**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-2		Electrical classification:	**none**
9A.2-3		Safety-related divisional equipment or cables:	**none**
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-11		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**3100 over sump**	**Cable insulation Class A combustibles**	**Area-wide photoelectric**	**Manual pulls (at EXITs)**	**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
	3100		**Area-wide ionization**			
-2000	**3200**					
-1400	**3203**					
4650	**3300**					

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Negligible**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3101**	Description:	**Corridor B**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-3** **9A.2-4**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**3101 over sump**	**Cable insulation Class A combustibles**	**Area-wide photoelectric**	**Manual pulls (at EXITs)**	**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
-2000	**rest of 3101**		**Area-wide ionization**			
-1400	**3262**					
4650						

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Negligible**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3110**	Description:	**Division 1 Electrical**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 90A, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-2		Electrical classification:	**none**
9A.2-3		Safety-related divisional equipment or cables:	**1**
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	**A**
9A.2-5		Surrounded by fire barriers rated at:	**3 hours**
9A.2-11		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**duct bank**	**Cable insulation**	**None**	**None**	**None**	**None**
	3110 below floor		**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
-6800	**3110**	**Cable insulation Electrical equipment**				
-2000	**3250**				**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
-1400	**3251**					
5250						
9060	**3403 3406**	**Class IIIB lubricants Cable insulation Filter media**				
	Charcoal Filter	**Charcoal**	**HVAC temperature indication**		**Internal manual spray**	

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3110 (continued)**	Description:	**Division 1 Electrical**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 90A, 101, 804**

< 700 at EL 9060; < 1400 EL -6800 & below	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700 at EL 9060; 1400 EL -6800 & below	Unsprinklered combustible load limit, MJ/m2	

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Significant**

The nonsafety-related MCR HVAC has redundant air handling units, but uses common ductwork. Where the common ductwork for one air handling unit could be exposed to fire involving the other redundant air handling unit, the HVAC ductwork will be wrapped or encapsulated in 3-hour fire rated material. Complete burnout of all equipment and cables within this Fire Area results in loss of only Division 1 safe shutdown equipment circuits, as well as redundant train A non-safety equipment; remaining three divisions of safe shutdown and redundant train B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3120**	Description:	**Division 2 Electrical**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-3**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**2**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:

EL	Room #	Potential Combustibles	Fire Detection Primary	Fire Detection Backup	Fire Suppression Primary	Fire Suppression Backup
-7400	**duct bank**	**Cable insulation**	**None**	**None**	**None**	**None**
	3120 below floor		**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
-6800	**3120**	**Cable insulation** **Electrical equipment**				

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Division 2 safe shutdown equipment circuits; remaining three divisions of safe shutdown and redundant trains A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Significant**

Table 9A.5-3
Control Building (cont.)

Fire Area:	F3130	Description:	Division 3 Electrical
Building:	Control	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-2		Electrical classification:	none
9A.2-3		Safety-related divisional equipment or cables:	3
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	B
9A.2-5		Surrounded by fire barriers rated at:	3 hours
		Except:	basemat (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	duct bank	Cable insulation	None	None	None	None
	3130 below floor		Area-wide ionization	Manual pulls (outside stairwell at each landing)	CO2 fire extinguishers	Hose racks (in nearby stairwells)
-6800	3130	Cable insulation Electrical equipment Insulation				
-1400	3260, 3261				Hose racks (in nearby stairwells)	ABC fire extinguishers
4650						
9060	3404 3407	Class IIIB lubricants Cable insulation Filter media				
	Charcoal Filter	Charcoal	HVAC temperature indication		Internal manual spray	

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3130 (continued)**	Description:	**Division 3 Electrical**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 90A, 101, 804**

< 700 at EL 9060; < 1400 EL -6800 & below	Anticipated combustible load, MJ/m2
700 at EL 9060; 1400 EL -6800 & below	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

The nonsafety-related MCR HVAC has redundant air handling units, but uses common ductwork. Where the common ductwork for one air handling unit could be exposed to fire involving the other redundant air handling unit, the HVAC ductwork will be wrapped or encapsulated in 3-hour fire rated material. Complete burnout of all equipment and cables within this Fire Area results in loss of only Division 3 safe shutdown equipment circuits, as well as redundant train B non-safety equipment; remaining three divisions of safe shutdown and redundant train A equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Significant**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3140**	Description:	**Division 4 Electrical**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-11**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**4**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**duct bank**	**Cable insulation**	**None**	**None**	**None**	**None**
-7400	**3140 below floor**		**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
-6800	**3140**	**Cable insulation Electrical equipment**				

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only Division 4 safe shutdown equipment circuits; remaining three divisions of safe shutdown and redundant trains A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Significant**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3150**	Description:	**DPS Control Room**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804**
DCD Fig.	**9A.2-4**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**4**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

consisting of the following Rooms:

EL	Room #	Potential Combustibles	Fire Detection Primary	Fire Detection Backup	Fire Suppression Primary	Fire Suppression Backup
4650	**3303 below floor**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of Diverse Protection System (DPS) equipment circuits; four divisions of safe shutdown and redundant trains A and B equipment are unaffected by fire and are operable. Automatic logic control scheme (any two out of four redundant signals) remains operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Significant**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3190**	Description:	**Stairwell A**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-2		Electrical classification:	**none**
9A.2-3		Safety-related divisional equipment or cables:	**none**
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-5		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**3190**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-2000						
4650						
9060						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3191**	Description:	**Elevator A**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-2		Electrical classification:	**none**
9A.2-3		Safety-related divisional equipment or cables:	**none**
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-5		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**3191**	**Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls**	**ABC fire extinguishers**	**Hose racks**
-2000		**Cable insulation**		**(outside Elev**	**(outside Elev**	**(in nearby stairwell)**
4650				**at each landing)**	**at each landing)**	
9060					**CO2 fire extinguisher**	
					(outside room)	

< 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700	Unsprinklered combustible load limit, MJ/m2	**Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.**

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and hoistway doors**
Property loss:	**Negligible**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3192**	Description:	**Stairwell B**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-2		Electrical classification:	**none**
9A.2-3		Safety-related divisional equipment or cables:	**none**
9A.2-4		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-5		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**3192**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-2000						
4650						
9060						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-3
Control Building (cont.)

Fire Area:	F3270	Description:	Main Control Room Complex
Building:	Control	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804
DCD Fig:	9A.2-3 9A.2-11	Building code occupancy classification:	B
		Electrical classification:	none
		Safety-related divisional equipment or cables:	1, 2, 3, 4
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		interior fire barriers rated at:	1 hour, around room 3275 Main Control Room

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-2000	below access floor	Cable insulation	Area-wide ionization	Manual pulls (outside stairwells at each landing)	CO2 fire extinguishers	Hose racks (in nearby stairwells)
	3274 3276	Cable insulation Class A combustibles				
-1400	3275	Cable insulation				
	3271, 3272, 3273 3274, 3204, 3205 3206, 3207, 3208 3206, 3207	Electrical equipment Class A combustibles Filter media Class IIIA lubricants			Hose racks (in nearby stairwells)	ABC fire extinguishers
	3277, 3274	none				
	3201, 3202	Class A combustibles	Area-wide photoelectric			
	above ceiling	Insulation	Area-wide ionization			

	< 1400	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
	1400	Unsprinklered combustible load limit, MJ/m2	

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	Reactor scram; turbine trip; outage required to restore
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells
Property loss:	Significant

Complete burnout of all equipment and cables within this Fire Area affects MCR control of all four divisions of safe shutdown equipment. Operators manually scram reactor before evacuating MCR. Reactor and safe shutdown control transferred to either of two (2) Remote Shutdown Panels (located in separate fire areas F1313 and F1323). All safety-related circuits and train A and B redundant circuits are optically isolated outside this fire area, so all safety divisional equipment both redundant trains A and B are operable. See also section 9A.6.

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3301**	Description:	**Nonsafety-related Electrical Train A**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804**
DCD Fig:	**9A.2-3** **9A.2-4** **9A.2-11**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-2000	**electrical chase**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
4650	**3301 below access floor**					
5250	**3301**	**Electrical equipment**				
9060	**3401, 3402**	**Cable insulation**				

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and redundant train B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Significant**

Table 9A.5-3
Control Building (cont.)

Fire Area:	**F3302**	Description:	**Nonsafety-related Electrical Train B**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804**
DCD Fig:	**9A.2-4** **9A.2-11**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**3302 below access floor**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
5250	**3302**	**Electrical equipment** **Cable insulation**				

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown equipment; all safety divisions and redundant train A are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Significant**

Table 9A.5-4

Turbine Building

Fire Area:	F4190	Description:	Elevator (Freight)
Building:	Turbine	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1
DCD Fig:		Building code occupancy classification:	F-1
9A.2-12	9A.2-16a	Electrical classification:	none
9A.2-13	9A.2-17	Safety-related divisional equipment or cables:	none
9A.2-14		Nonsafety-related redundant trains or equipment or cables:	none
9A.2-15		Surrounded by fire barriers rated at:	3 hours
9A.2-16		Except:	basemat (non-rated); elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	4190	Class IIIB lubricants Cable Insulation	Area-wide ionization (in elevator pit)	Manual pulls (outside elevator at each elevation)	ABC fire extinguishers (outside Elevator at each elevation)	Hose racks (outside stairwell)
4650						
12000						
20000						
28000						
35000						
38000	4701	Class IIIB lubricants Cable Insulation Electrical Equipment	Area-wide ionization (in equipment room)		CO2 fire extinguisher (outside room)	

<700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells and hoistway doors
Property loss:	Negligible

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4191**	Description:	**Stairwell A**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-12	**9A.2-16a**	Electrical classification:	**none**
9A.2-13	**9A.2-17**	Safety-related divisional equipment or cables:	**none**
9A.2-14		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-15		Surrounded by fire barriers rated at:	**3 hours**
9A.2-16		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4191**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Hose racks (outside stairwell at each elevation)**	**Area ABC fire extinguishers (outside stairwell at each elevation)**
4650						
12000						
20000						
28000						
35000						
38000						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	F4192	Description:	Elevator (Personnel)
Building:	Turbine	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1
DCD Fig:		Building code occupancy classification:	F-1
9A.2-12 9A.2-16a		Electrical classification:	none
9A.2-13 9A.2-17		Safety-related divisional equipment or cables:	none
9A.2-14		Nonsafety-related redundant trains or equipment or cables:	none
9A.2-15		Surrounded by fire barriers rated at:	3 hours
9A.2-16		Except:	basemat (non-rated); elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400 4650 12000 20000 28000 35000	4192	Class IIIB lubricants Cable insulation	Area-wide ionization (in elevator pit)	Manual pulls (outside elevator at each elevation)	Area ABC fire extinguishers (outside elevator at each elevation)	Hose racks (outside stairwell at each elevation)
38000	4702	Class IIIB lubricants Cable insulation Electrical equipment	Area-wide ionization (in equipment room)		CO2 fire extinguisher (outside room)	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells and hoistway doors
Property loss:	Negligible

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4193**	Description:	**Stairwell B**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-12	**9A.2-16a**	Electrical classification:	**none**
9A.2-13	**9A.2-17**	Safety-related divisional equipment or cables:	**none**
9A.2-14		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-15		Surrounded by fire barriers rated at:	**3 hours**
9A.2-16		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4193**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Hose racks (outside stairwell at each elevation)**	**Area ABC fire extinguishers (outside stairwell at each elevation)**
4650						
12000						
20000						
28000						
35000						
38000						
42000						
56500						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4194**	Description:	**Stairwell C**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-12	**9A.2-16a**	Electrical classification:	**none**
9A.2-13		Safety-related divisional equipment or cables:	**none**
9A.2-14		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-15		Surrounded by fire barriers rated at:	**3 hours**
9A.2-16		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4194**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Hose racks (outside stairwell at each elevation)**	**Area ABC fire extinguishers (outside stairwell at each elevation)**
4650						
12000						
20000						
28000						
38000						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4195**	Description:	**Stairwell D**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-12 **9A.2-16a**		Electrical classification:	**none**
9A.2-13		Safety-related divisional equipment or cables:	**none**
9A.2-14		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-15		Surrounded by fire barriers rated at:	**3 hours**
9A.2-16		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400 **4650** **12000** **20000** **28000** **38000**	**4195**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Hose racks (outside stairwell at each elevation)**	**Area ABC fire extinguishers (outside stairwell at each elevation)**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4196**	Description:	**Charcoal Adsorbers**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 15, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-12		Electrical classification:	**none**
9A.2-13		Safety-related divisional equipment or cables:	**none**
9A.2-19		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4196**	**Charcoal Adsorber A Adsorber B Adsorber C Adsorber D Adsorber E Adsorber F Adsorber G Adsorber H**	**Process indication Rate of rise internal**	**Manual pulls (outside room)**	**Internal manual spray in each adsorber vessel**	**Hose racks (outside room)**
		Class IIIB lubricants Cable insulation	**Area-wide ionization**		**Area ABC fire extinguishers (outside room)**	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and interior doors**
Property loss:	**Moderate**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	F4197	Description:	Turbine Equipment
Building:	Turbine	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 12, 13, 14, 15, 72, 90A, 497, 101, 804
DCD Fig:	9A.2-12, 9A.2-13, 9A.2-14, 9A.2-15, 9A.2-16, 9A.2-18, 9A.2-19	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	1, 2, 3, 4
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		Except:	elevator doors (1.5 hr rated); basemat, exterior underground walls, exterior walls above EL 28000, roof (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	4100, 4101, 4102A, 4102B, 4103, 4106, 4107, 4108, 4109, 4180, 4181, 4182A, 4182B, 4182C, 4182D, 4182E, 4182F, 4183, 4197	Class IIIB lubricants Cable insulation Filter media	Area-wide ionization	Manual pulls (outside stairwell at each elevation)	Area ABC fire extinguishers	Area hose racks
	4104, 4105A, 4105B, 4197		Suppression flowswitch		Wet-pipe sprinkler 16.3 L/min per m2 over most remote 465 m2	
	4100 Reactor Feed Booster Pumps		Area-wide ionization		Preaction Sprinkler 12.2 L/min per m2 over most remote 302 m2	
4650	4206A, 4206B				Wet-pipe sprinkler 16.3 L/min per m2 over most remote 465 m2	
	4202A, 4202B	< 28 m3 Hydrogen Class IIIB lubricants	Area-wide spot heat		Area ABC fire extinguishers	
	4200 Reactor Feed Pumps	Class IIIB lubricants Cable insulation Filter media	Area-wide ionization		Preaction Sprinkler 12.2 L/min per m2 over most remote 302 m2	

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	F4197 (continued)	Description:	Turbine Equipment (continued)
Building:	Turbine	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 12, 13, 14, 15, 72, 90A, 497, 101, 804
DCD Fig:	9A.2-12, 9A.2-13, 9A.2-14, 9A.2-15, 9A.2-16, 9A.2-18, 9A.2-19	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	1, 2, 3, 4
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		Except:	elevator doors (1.5 hr rated); basemat, exterior underground walls, exterior walls above EL 28000, roof (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	4200, 4201, 4203, 4204A, 4204B, 4205, 4280, 4281A, 4281B, 4281C, 4281D, 4281E, 4281F, 4281G, 4281H, 4282A, 4282B, 4282C, 4282D, 4282E, 4282F, 4282G, 4282H, 4284, 4290, 4291, 4292,	Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside stairwell at each elevation)	Area ABC fire extinguishers	Area hose racks
6000	4284					
7650	4283					
12000	4300, 4301A, 4301B, 4304, 4350, 4390	Class IIIB lubricants Cable insulation Filter media				
	4300 EHC Unit	<3,500 L Class IIIA hydraulic oil	Suppression flowswitch		Dry-pilot deluge 12.2 L/min per m2	
	4305, 4306	Cable insulation Class IIIB lubricants			Wet-pipe sprinkler 16.3 L/min per m2 over most remote 465 m2	

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	F4197 (continued)	Description:	Turbine Equipment (continued)
Building:	Turbine	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 12, 13, 14, 15, 72, 90A, 497, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-12 9A.2-18		Electrical classification:	none
9A.2-13 9A.2-19		Safety-related divisional equipment or cables:	1, 2, 3, 4
9A.2-14		Nonsafety-related redundant trains or equipment or cables:	none
9A.2-15		Surrounded by fire barriers rated at:	3 hours
9A.2-16		Except:	elevator doors (1.5 hr rated); basemat, exterior underground walls, exterior walls above EL 28000, roof (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
10700	4391 (steam tunnel)	Cable insulation Class IIIB lubricants	Suppression flowswitch	Manual pulls (outside stairwell at each elevation)	Wet-pipe sprinkler 16.3 L/min per m2 over most remote 465 m2	Area hose racks
17500	4391 (end of tunnel)					
20000	4400, 4401, 4402A, 4402B, 4404, 4405, 4460		Area-wide ionization		Area ABC fire extinguishers	
	4400 (northwest) H2 seal oil unit	< 11,000 L Class IIIA seal oil	Suppression flowswitch		Dry-pilot deluge 12.2 L/min per m2	
20000	4400 Iso-Phase Bus	Class IIIB lubricants Cable insulation Electrical Equipment	Suppression flowswitch	Manual pulls (outside stairwells at each elevation)	Dry-pipe sprinkler 8.1 L/min per m2 over most remote 181 m2	Area hose racks

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	F4197 (continued)	Description:	Turbine Equipment (continued)
Building:	Turbine	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 12, 13, 14, 15, 72, 90A, 497, 101, 804
DCD Fig:	9A.2-12, 9A.2-18, 9A.2-13, 9A.2-19, 9A.2-14, 9A.2-15, 9A.2-16	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	1, 2, 3, 4
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		Except:	elevator doors (1.5 hr rated); basemat, exterior underground walls, exterior walls above EL 28000, roof (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
28000	4500, 4501, 4502, 4503, 4504, 4505, 4506	Class IIIB lubricants Cable insulation Filter media	Area-wide ionization		Area ABC fire extinguishers	
	Turbine-generator bearings	Class IIIB lubricants	Spot heat over each bearing		Automatic preaction spray 16.3 L/min per m2 over entire area	
	Generator housing	< 56 m3 Hydrogen	Process indication		Manual low pressure CO2 30% concentration two-shot volume	CO2 fire extinguishers
	Exciter housing		Area-wide ionization			
35000	4600, 4601	Class IIIB lubricants Cable insulation Filter media			Area ABC fire extinguishers	Area hose racks

> 700 in rooms where turbine oil can flow	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700	Unsprinklered combustible load limit, MJ/m2	

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	Turbine trip; restoration required prior to restart
Radiological release:	Contained within building
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells
Property loss:	Significant

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions are operable. Fire-related failure of safety-related instrumentation (13.8 kV Bus Under voltage transducers) may cause reactor scram. See Section 15.2.5.2.

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4250**	Description:	**Reactor Component Cooling Water A**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-13** **9A.2-19**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**4250**	**Electrical equipment** **Cable insulation** **Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Hose racks (outside stairwell)**	**CO2 fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A equipment and no safety-related or safe shutdown divisional equipment. All redundant train B equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4260**	Description:	**Reactor Component Cooling Water B**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-13**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**4260**	**Electrical equipment Cable insulation Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Hose racks (outside stairwell)**	**CO2 fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B equipment and no safety-related or safe shutdown divisional equipment. All redundant train A equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4302**	Description:	**Instrument Air / Service Air Train A**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-14**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
12000	**4302**	**Cable insulation Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Hose racks (outside stairwell)**	**Area ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A equipment and no safety-related or safe shutdown divisional equipment. All redundant train B equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4303**	Description:	**Instrument Air / Service Air Train B**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-14**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
12000	**4303**	**Cable insulation Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwells at each landing)**	**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B equipment and no safety-related or safe shutdown divisional equipment; all safety division and redundant train A equipment are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4403**	Description:	**Turbine Lube Oil**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 11, 13, 14, 15, 16, 72, 101, 804**
DCD Fig:	**9A.2-15**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
20000	**4403**	**< 50,000 L Class IIIB lubricants Cable insulation**	**Suppression flowswitch**	**Manual pulls (outside stairwell)**	**Dry-pilot foam-water deluge 16.3 L/min per m2**	**Area Hose racks**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Turbine trip; restoration required prior to restart**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior door**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4550**	Description:	**Chilled Water A**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASHRAE 15**
DCD Fig:	**9A.2-16** **9A.2-18**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
28000	**4550**	**Electrical equipment** **Cable insulation** **Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Area Hose racks**	**Area ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A equipment and no safety-related or safe shutdown divisional equipment. All redundant train B equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4560**	Description:	**Chilled Water B**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASHRAE 15**
DCD Fig:	**9A.2-16**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
28000	**4560**	**Electrical equipment Cable insulation Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Area Hose racks**	**Area ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B equipment and no safety-related or safe shutdown divisional equipment. All redundant train A equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4650**	Description:	**Water Surge Tanks A (CWS & RCCWS)**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-16a**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**roof (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
35000	**4650**	**Cable insulation Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Area Hose racks**	**Area ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A equipment and no safety-related or safe shutdown divisional equipment. All redundant train B equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A.5-4
Turbine Building (Cont.)

Fire Area:	**F4660**	Description:	**Water Surge Tanks B (CWS & RCCWS)**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-16a**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**roof (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
35000	**4660**	**Cable insulation Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Area Hose racks**	**Area ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B equipment and no safety-related or safe shutdown divisional equipment. All redundant train A equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A.5-5

Radwaste Building

Fire Area:	F6101	Description:	Radwaste Handling Equipment
Building:	Radwaste	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 90A, 101, 804
DCD Fig:	9A.2-20 9A.2-21 9A.2-22 9A.2-23 9A.2-24	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		Except:	basemat (non-rated); exterior underground walls (non-rated);

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-9350	6100, 6101, 6102, 6103, 6104, 6105, 6106, 6107, 6108, 6109, 6150, 6151, 6160, 6161, 6171, 6172, 6180, 6181, 6182, 6183, 6184, 6185, 6186, 6187, 6188, 6189	Class IIIB lubricants Cable insulation Transient combustibles Class A combustibles	Suppression flowswitch	Manual pulls (outside stairwell at each landing)	Wet-pipe sprinkler 8.1 L/min per m2 over 140 m2	Hose racks (in nearby stairwells) ABC fire extinguishers
-2350	6103, 6104, 6105, 6106, 6107, 6108, 6109, 6150, 6151, 6160, 6161, 6171, 6172, 6200, 6201, 6280, 6281, 6282, 6283, 6284, 6285, 6286					
4650	6381					
	6381, Charcoal Filter	Charcoal	HVAC temperature indication		Internal manual spray	

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None; restoration required before handling radwaste
Radiological release:	Contained within building
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells and exterior doors
Property loss:	Moderate

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6102**	Description:	**Electrical Equipment**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-20**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); elevator doors (1.5 hr rated); exterior underground walls (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-9350	**6170**	**Electrical equipment Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwells at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; restoration required before handling radwaste**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6190**	Description:	**Elevator**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-20		Electrical classification:	**none**
9A.2-21		Safety-related divisional equipment or cables:	**none**
9A.2-22		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-23		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-9350	**6190**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls (outside Elev at each landing)**	**ABC fire extinguishers (outside Elev at each landing)**	**Hose racks (in nearby stairwell)**
-2350						
4650						
10650						
13650	**6580**	**Class IIIB lubricants Cable insulation Electrical equipment**			**CO2 fire extinguisher (outside room)**	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and hoistway doors**
Property loss:	**Negligible**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6191**	Description:	**Stairwell A**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-20		Electrical classification:	**none**
9A.2-21		Safety-related divisional equipment or cables:	**none**
9A.2-22		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-23		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-9350	**6191**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-2350						
4650						
10650						
13650						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6192**	Description:	**Stairwell B**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-20		Electrical classification:	**none**
9A.2-21		Safety-related divisional equipment or cables:	**none**
9A.2-22		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-23		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-9350 **-2350** **4650** **10650**	**6192**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6193**	Description:	**Stairwell C**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-20** **9A.2-21** **9A.2-22**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-9350 **-2350** **4650**	**6193**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6194**	Description:	**Stairwell D**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-20** **9A.2-21** **9A.2-22** **9A.2-23**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-9350 **-2350** **4650** **10650**	**6194**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6270**	Description:	**Radwaste Control Room Complex**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-21** **9A.2-22**	Building code occupancy classification:	**B**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**elevator doors (1.5 hr rated); basemat for 6287 (non-rated)**
		interior fire barriers rated at:	**1 hours**
		between:	**rooms 6270 and 6287**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-2350	**6270**	**Electrical equipment** **Cable insulation** **Class A combustibles**	**Area-wide ionization**	**Manual pulls (outside stairwells at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
	6270 below floor	**Cable insulation**			**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
	6287	**Electrical equipment** **Cable insulation**				
4650	**6382**	**Class A combustibles**				

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; restoration required before handling radwaste**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	**F6290**	Description:	**Stairwell E**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-21** **9A.2-22**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-2350 **4650**	**6290**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-5
Radwaste Building (cont.)

Fire Area:	F6301	Description:	HVAC Equipment
Building:	Radwaste	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:	9A.2-22 9A.2-23	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		Except:	elevator doors (1.5 hr rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	6380	Class IIIB lubricants Cable insulation	Area-wide ionization	Manual pulls (outside stairwells at each landing)	Hose racks	ABC fire extinguishers
10650	6480	Filter media				
	6490	None				

< 700	Anticipated combustible load, MJ/m2	
700	Unsprinklered combustible load limit, MJ/m2	

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None; restoration required before handling radwaste
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via stairwells
Property loss:	Minor

Table 9A.5-6

Electrical Building

Fire Area:	F5100	Description:	Corridors
Building:	Electrical	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804
DCD Fig:		Building code occupancy classification:	F-1
9A.2-25		Electrical classification:	none
9A.2-26		Safety-related divisional equipment or cables:	none
9A.2-28		Nonsafety-related redundant trains or equipment or cables:	none
9A.2-30		Surrounded by fire barriers rated at:	3 hours
9A.2-32		Except:	basemat (non-rated); roof (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	5100, 5101, 5189	Cable insulation	Area-wide ionization	Manual pulls (at exits)	Area hose racks	Area ABC fire extinguishers
7650	5196					
9080	5200					
18000	5300					
27000	5400					

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via doors
Property loss:	Negligible

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5104**	Description:	**Fire Protection Equipment**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 15, 16, 72, 101, 804**
DCD Fig:	**9A.2-25**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5104**	**Cable insulation Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (at exits)**	**Area Hose racks**	**Area ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5151**	Description:	**Batteries A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-25**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
4650	**5102**	**3,420 L of battery acid Battery cell cases Cable insulation**	**Area-wide ionization**	**Manual pulls (at exits)**	**CO2 fire extinguishers (outside room)**	**Hose racks (outside room)**
	5103	**13,680 L of battery acid Battery cell cases Cable insulation**				
	5151	**11,040 L of battery acid Battery cell cases Cable insulation**				

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site power and related equipment and no Safety Related equipment. All redundant train B on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5153**	Description:	**Stand-by Diesel Generator A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 72, 101, 804**
DCD Fig:	**9A.2-25** **9A.2-26**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650 **9800**	**5153**	**Cable insulation** **Class IIIB lubricants** **Class II fuel oil**	**Cross-zoned Ultraviolet/Infrared and spot heat**	**Suppression flowswitch**	**Preaction foam sprinkler 10.2 L/min per m2 over entire area**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site power and related equipment and no Safety Related equipment. All redundant train B on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5154**	Description:	**Cable Chase Train A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-25** **9A.2-26**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
4650 **9800**	**5154**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (at exits)**	**CO2 fire extinguishers**	**Hose racks (outside stairwell)**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site power and related equipment and no Safety Related equipment. All redundant train B on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Minor**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5161**	description:	**Batteries B**
Building:	**Electrical**	applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804**
DCD Fig:	**9A.2-25** **9A.2-32**	building code occupancy classification:	**F-1 per IBC 307.9.11**
		electrical classification:	**none**
		safety-related divisional equipment or cables:	**none**
		nonsafety-related redundant trains or equipment or cables:	**B**
		surrounded by fire barriers rated at:	**3 hours**
		except:	**basemat (non-rated)**

consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
4650	**5105**	**13,680 L of battery acid** **Battery cell cases** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**
	5106	**3,420 L of battery acid** **Battery cell cases** **Cable insulation**				
	5161	**11,040 L of battery acid** **Battery cell cases** **Cable insulation**				

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site power and related equipment and no Safety Related equipment. All redundant train A on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5163**	Description:	**Stand-by Diesel Generator B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-25		Electrical classification:	**none**
9A.2-26		Safety-related divisional equipment or cables:	**none**
9A.2-32		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650 9800 18000	**5163**	**Cable insulation Class IIIB lubricants Class II fuel oil**	**Cross-zoned Ultraviolet/Infrared and spot heat**	**Suppression flowswitch**	**Preaction foam sprinkler 10.2 L/min per m2 over entire area**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site power and related equipment and no Safety Related equipment. All redundant train A on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5164**	Description:	**Cable Chase Train B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-25**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles and Hazards	Primary	Backup	Primary	Backup
4650	**5164**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (at exits)**	**Area CO2 fire extinguishers**	**Area hose racks**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site power and related equipment and no Safety Related equipment. All redundant train A on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Minor**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5180**	Description:	**Technical Support Center Complex**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 90A, 101, 804; 28 CFR 36**
DCD Fig:	**9A.2-25**	Building code occupancy classification:	**B**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5180, 5181A, 5181B, 5181C, 5181D, 5182A, 5182B, 5183A, 5183B, 5184, 5185, 5186, 5187A, 5187B, 5187C, 5188,**	**Computer equipment Furniture Cable insulation Class A combustibles Transient combustibles**	**Suppression flowswitch**	**Manual pulls (at exits)**	**Wet-pipe sprinkler 4.1 L/min per m2 over most remote 140 m2**	**Hose racks (outside stairwell)**
7650	**5195**					
	above ceiling	**Insulation**	**Area-wide ionization**		**Area ABC fire extinguishers**	

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Minor**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5190**	Description:	**Elevator (Freight)**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-25		Electrical classification:	**none**
9A.2-26		Safety-related divisional equipment or cables:	**none**
9A.2-28		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-30		Surrounded by fire barriers rated at:	**3 hours**
9A.2-31		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5190**	**Class IIIB lubricants** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside elevator at each elevation)**	**Area ABC fire extinguishers (outside elevator at each elevation)**	**Hose racks (in nearby stairwell)**
9800						
18000						
27000						
31500	**5501**	**Class IIIB lubricants** **Cable insulation** **Electrical equipment**				

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and hoistway doors**
Property loss:	**Negligible**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5191**	Description:	**Elevator (Personnel)**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804; ASME A17.1**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-25		Electrical classification:	**none**
9A.2-26		Safety-related divisional equipment or cables:	**none**
9A.2-28		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-30		Surrounded by fire barriers rated at:	**3 hours**
9A.2-31		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5191**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls (outside elevator at each elevation)**	**Area ABC fire extinguishers (outside elevator at each elevation)**	**Hose racks (in nearby stairwell)**
7650						
9800						
18000						
27000						
31500	**5502, 5503**	**Class IIIB lubricants Cable insulation Electrical Equipment**				

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and hoistway doors**
Property loss:	**Negligible**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5192**	Description:	**Stairwell A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-25		Electrical classification:	**none**
9A.2-26		Safety-related divisional equipment or cables:	**none**
9A.2-28		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-30		Surrounded by fire barriers rated at:	**3 hours**
9A.2-31		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5192**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Area hose racks**	**Area ABC fire extinguishers**
9800						
18000						
27000						
31500						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5193**	Description:	**Stairwell B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-25		Electrical classification:	**none**
9A.2-26		Safety-related divisional equipment or cables:	**none**
9A.2-28		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-30		Surrounded by fire barriers rated at:	**3 hours**
9A.2-31		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5193**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Area hose racks**	**Area ABC fire extinguishers**
7650						
9800						
13900						
18000						
27000						
31500						

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5194**	Description:	**Stairwell C**
Building:	**Electrical**	Applicable Codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-25** **9A.2-32**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-2000 **4650**	**5194**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**Area hose racks**	**Area ABC fire extinguishers**

negligible	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5201**	Description:	**Switchgear, Lower Cable & Battery Charger I**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-26**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9800	**5201**	**Electrical equipment Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (outside each room)**

> 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site and off-site power and related equipment. All redundant train B on-site and off-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5202**	Description:	**Battery C**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-26**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**C**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9800	**5202**	**5520 L of battery acid Battery cell cases Cable insulation**	**Area-wide ionization**	**Manual pulls (at exits)**	**CO2 fire extinguishers**	**Area hose racks**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment. Both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5203**	Description:	**Load Center & Battery Charger III**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-26**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**C**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9800	**5203**	**Electrical equipment Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (outside stairwell)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment. Both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5204**	Description:	**Switchgear, Lower Cable & Battery Charger II**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-26** **9A.2-32**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9800	**5204**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (outside stairwell)**

> 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site and off-site power and related equipment. All redundant train A on-site and off-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	F5205	Description:	Electronic Equipment
Building:	Electrical	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804
DCD Fig:	9A.2-26 9A.2-32	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	none
		Surrounded by fire barriers rated at:	3 hours
		Except:	none

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9800	5205	Electrical equipment Cable insulation	Area-wide ionization	Manual pulls (outside stairwell)	CO2 fire extinguishers	Hose racks (outside stairwell)

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via doors
Property loss:	Moderate

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5250**	Description:	**Stand-by Diesel Generator Day Tank A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 15, 16, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-26** **9A.2-28**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours, roof and roof grating 1.5 hours**
		Except:	

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
12000	**5250**	**Cable insulation** **Class IIIB lubricants** **20,000L Class II fuel oil**	**Cross-zoned Ultraviolet/Infrared and spot heat**	**Suppression flowswitch**	**Preaction foam deluge 16.3 L/min per m2**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site power and related equipment and no Safety Related equipment. All redundant train B on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Confined space entry**
Manual firefighting:	**Access via roof hatch**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5251**	Description:	**Stand-by Diesel Generator Electrical & Control Equipment Room A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 72, 101, 804**
DCD Fig:	**9A.2-26**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9800	**5206, 5251**	**Electrical equipment**	**Area-wide ionization**	**Manual pulls**	**CO2 fire extinguishers**	**Hose racks**
13900	**5252**	**Cable insulation**		**(outside stairwell)**		**(inside vestibule 4)**

> 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site power and related equipment and no Safety Related equipment. All redundant train B on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5260**	Description:	**Stand-by Diesel Generator Day Tank B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 15, 16, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-26** **9A.2-32**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
12000	**5260**	**Cable insulation Class IIIB lubricants 20,000L Class II fuel oil**	**Cross-zoned Ultraviolet/Infrared and spot heat**	**Suppression flowswitch**	**Preaction foam deluge 16.3 L/min per m2**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Confined space entry**
Manual firefighting:	**Access via roof hatch**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site power and related equipment and no Safety Related equipment. All redundant train A on-site power and related equipment is operable.

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	F5261	Description:	Stand-by Diesel Generator Electrical & Control Equipment Room B
Building:	Electrical	Applicable codes:	IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 72, 101, 804
DCD Fig:	9A.2-26	Building code occupancy classification:	F-1
		Electrical classification:	none
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	B
		Surrounded by fire barriers rated at:	3 hours
		Except:	basemat (non-rated)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
9800	5261	Electrical equipment	Area-wide ionization	Manual pulls (outside stairwell)	CO2 fire extinguishers	Hose racks (inside vestibule 4)
13900	5262	Cable insulation				

> 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site power and related equipment and no Safety Related equipment. All redundant train A on-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	Travel distance limits to EXITs meet NFPA 101
Manual firefighting:	Access via doors
Property loss:	Significant

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5350**	Description:	**Electrical Equipment A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-28**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
18000	**5350**	**Electrical equipment Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (outside stairwell)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site and off-site power and related equipment and no Safety Related equipment. All redundant train B on-site and off-site power and related equipment is operable.

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5360**	Description:	**Electrical Equipment B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-28** **9A.2-32**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
18000	**5360**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (outside stairwell)**

< 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site and off-site power and related equipment and no Safety Related equipment. All redundant train A on-site and off-site power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5450**	Description:	**HVAC TSC & EER Equipment A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 15, 72, 90A, 101, 804**
DCD Fig:	**9A.2-25** **9A.2-26** **9A.2-28** **9A.2-30**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650 **7650**	**5150, 5152**	**Class IIIB lubricants** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Hose racks (outside stairwell at each elevation)**	**Area ABC fire extinguishers**
9800 **18000** **27000**	**5401, 5450** **5150** **5152**	**Filter media** **Insulation**				

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train A equipment. All redundant train B related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior doors**
Property loss:	**Moderate**

Table 9A.5-6
Electrical Building (Cont.)

Fire Area:	**F5460**	Description:	**HVAC TSC & EER Equipment B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 15, 72, 90A, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-25		Electrical classification:	**none**
9A.2-26		Safety-related divisional equipment or cables:	**none**
9A.2-28		Nonsafety-related redundant trains or equipment or cables:	**B**
9A.2-30		Surrounded by fire barriers rated at:	**3 hours**
9A.2-32		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650 **7650**	**5160, 5162**	**Class IIIB lubricants** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each elevation)**	**Hose racks (outside stairwell at each elevation)**	**Area ABC fire extinguishers**
9800 **18000**	**5402, 5460** **5160**	**Filter media** **Insulation**				
27000	**5162**					

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train B equipment. All redundant train A related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via interior doors**
Property loss:	**Moderate**

Table 9A.5-7

Yard

Fire Area:	**F4201**	Description:	**Lube Oil Storage**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 13, 15, 16, 24, 30, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**U per IBC 312.1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**none**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Lube Oil Storage**	**191,000L Class IIIB lubricating oil**	**Suppression flowswitch**	**Lube Oil system instrumentation**	**Dry-pilot foam deluge 12.2 L/min per m2**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; restoration required before Lube Oil outage**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access from open north side**
Property loss:	**Moderate**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F4202**	Description:	**Hydrogen Storage**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 50A, 72, 497, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**U per IBC 312.1**
		Electrical classification:	**Class I Div 2 Group B**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**none**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Hydrogen Storage**	**860 m3 hydrogen**	**H2 system instrumentation**	**Manual pull (outside hazard)**	**Hydrant**	**ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Turbine power reduction (due to loss of H2 makeup)**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access all around**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F4271**	Description:	**Phase A Main Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-13**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); north side (open); top (open)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Main Transformer A**	**>18,900L Class IIIA insulating mineral oil (~625 MVA)**	**Dry-pilot heat around transformer**	**Transformer instrumentation**	**Dry-pilot deluge 10.2 L/min per m2 on all surfaces**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Turbine trip; outage required to replace main transformer with spare transformer.**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Significant**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F4272**	Description:	**Phase B Main Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-13**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); north side (open); top (open)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Main Transformer B**	**>18,900L Class IIIA insulating mineral oil (~625 MVA)**	**Dry-pilot heat around transformer**	**Transformer instrumentation**	**Dry-pilot deluge 10.2 L/min per m2 on all surfaces**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Turbine trip; outage required to replace main transformer with spare transformer**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Significant**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F4273**	Description:	**Phase C Main Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-13**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); north side (open); top (open)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Main Transformer C**	**>18,900L Class IIIA insulating mineral oil (~625 MVA)**	**Dry-pilot heat around transformer**	**Transformer instrumentation**	**Dry-pilot deluge 10.2 L/min per m2 on all surfaces**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Turbine trip; outage required to replace MT w/ ST**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Significant**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F4274**	Description:	**Spare Main Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-13**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours only on east side**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Spare Main Transformer**	**>18,900L Class IIIA insulating mineral oil (~625 MVA)**	**Dry-pilot heat around transformer**	**Transformer instrumentation**	**Dry-pilot deluge 10.2 L/min per m2 on all surfaces**	**Hydrants**

negligible	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access via all sides Except east**
Property loss:	**Moderate**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F5157**	Description:	**Reserve Auxiliary Transformer A**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-25**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); north side (open); top (open)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Reserve Auxiliary Transformer A**	**>18,900L Class IIIA insulating mineral oil (~105 MVA)**	**Dry-pilot heat around transformer**	**Transformer instrumentation**	**Dry-pilot deluge 10.2 L/min per m2 on all surfaces**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A off-site power and related equipment and no safety-related equipment; all safety divisions, train A on-site power and related equipment, and redundant train B equipment are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Significant**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F5158**	Description:	**Unit Auxiliary Transformer A**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-25**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); north side (open); top (open)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Unit Auxiliary Transformer A**	**>18,900L Class IIIA insulating mineral oil (~105 MVA)**	**Dry-pilot heat around transformer**	**Transformer instrumentation**	**Dry-pilot deluge 10.2 L/min per m2 on all surfaces**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A off-site power and related equipment and no safety-related equipment; all safety divisions, train A on-site power and related equipment, and redundant train B equipment are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Significant**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F5159**	Description:	**Fuel Oil Storage A**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 11, 16, 24, 30, 72, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**none**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Fuel Oil Tank A**	**~908,500L Class II fuel oil**	**Spot heat inside tank**	**Ultraviolet/Infrared fire detection inside tank**	**Automatic foam surface cross-zoned deluge 6.5 L/min per m2**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A on-site power and related equipment and no safety-related equipment; all safety divisions and redundant train B on-site power and related equipment are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access all around**
Property loss:	**Moderate**

Table 9A.5-7
Yard (Cont.)

Fire Area:	F5167	Description:	Reserve Auxiliary Transformer B
Building:	Yard	Applicable codes:	IBC; Reg Guide 1.189; NFPA 15, 24, 804
DCD Fig:	9A.2-25	Building code occupancy classification:	U
		Electrical classification:	none
		Safety-related divisional equipment or cables:	none
		Nonsafety-related redundant trains or equipment or cables:	B
		Surrounded by fire barriers rated at:	3 hours
		Except:	basemat (non-rated); north side (open); top (open)

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	Reserve Auxiliary Transformer B	>18,900L Class IIIA insulating mineral oil (~105 MVA)	Dry-pilot heat around transformer	Transformer instrumentation	Dry-pilot deluge 10.2 L/min per m2 on all surfaces	Hydrants

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B off-site power and related equipment and no safety-related equipment; all safety divisions, train B on-site power and related equipment, and redundant train A equipment are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	None
Radiological release:	None, no radiological materials present
Life safety:	N/A
Manual firefighting:	Access via open north side
Property loss:	Significant

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F5168**	Description:	**Unit Auxiliary Transformer B**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-25** **9A.2-32**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); north side (open); top (open)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Unit Auxiliary Transformer B**	**>18,900L Class IIIA insulating mineral oil (~105 MVA)**	**Dry-pilot heat around transformer**	**Transformer instrumentation**	**Dry-pilot deluge 10.2 L/min per m2 on all surfaces**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B off-site power and related equipment and no safety-related equipment; all safety divisions, train B on-site power and related equipment, and redundant train A equipment are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Significant**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F5169**	Description:	**Fuel Oil Storage B**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 11, 16, 24, 30, 72, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**U**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**none**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Fuel Oil Tank B**	**908,500L Class II fuel oil**	**Spot heat inside tank**	**UV/IR fire detection inside tank**	**Automatic foam surface cross-zoned deluge 6.5 L/min per m2**	**Hydrants**

> 700	Anticipated combustible load, MJ/m2
N/A	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B on-site power and related equipment and no safety-related equipment; all safety divisions and redundant train A on-site power and related equipment are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**N/A**
Manual firefighting:	**Access all around**
Property loss:	**Moderate**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7100**	Description:	**Pump House**
Building:	**Pump House**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class IIIB lubricants Cable Insulation**	**Area wide ionization**	**Manual pulls (at EXITs)**	**Hose racks**	**ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment, but could affect redundant train A and B nonsafety-related equipment; all safety divisions and both on-site and off-site power supplies A and B are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**Turbine trip**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**to be determined during detailed design**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**Site Specific**	Description:	**Secondary Nonseismic Diesel Fire Pump**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 20, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1 per IBC 307.9.5**
	Site Specific	Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**Site Specific**
		Except:	**Site Specific**

Consisting of the following Rooms:

EL	Room #	Potential Combustibles	Fire Detection Primary	Fire Detection Backup	Fire Suppression Primary	Fire Suppression Backup
4650	**Site Specific**	**Site Specific**	**Site Specific**	**Site Specific**	**Site Specific**	**Hydrant**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Site Specific**
Manual firefighting:	**Site Specific**
Property loss:	**Minor**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only the nonseismic diesel-driven fire pump; remaining secondary motor-driven fire pump is unaffected by fire and is operable. All safe shutdown equipment and both A and B on-site power sources are unaffected by fire and are operable.

Table 9A.5-7
Yard (Cont.)

Fire Area:	**Site Specific**	Description:	**Secondary Nonseismic Motor-driven Fire Pump**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 20, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-33 Site Specific**	Building code occupancy classification:	**F-1 per IBC 307.9.5**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**Site Specific**
		Surrounded by fire barriers rated at:	**Site Specific**
		Except:	**Site Specific**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**Site Specific**	**Site Specific**	**Site Specific**	**Site Specific**	**Site Specific**	**Hydrant**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only the nonseismic motor driven fire pump; remaining secondary diesel fire pump is unaffected by fire and is operable. All safe shutdown equipment and both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Site Specific**
Manual firefighting:	**Site Specific**
Property loss:	**Minor**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**Site Specific**	Description:	**Guard House**
Building:	**Guard House**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 72, 90A, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**B**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class A combustibles Cable insulation**	**Area-wide ionization**	**Manual pulls at EXITs**	**ABC fire extinguishers**	**Hydrant**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**to be determined during detailed design**
Property loss:	**to be determined during detailed design**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7200**	Description:	**Hot Machine Shop & Storage**
Building:	**Hot Machine Shop**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class A combustibles** **Cable insulation** **Transient combustibles** **Class IIIB lubricants**	**Area wide linear heat**	**Manual pulls (at EXITs)**	**Hose racks**	**ABC fire extinguishers** **Class D fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**Contained within building**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**1.9 m2 access required in every 15 m of exterior wall**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7300**	Description:	**Service Water / Water Treatment Building**
Building:	**Service Water**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**to be determined during detailed design**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class IIIB lubricants Cable insulation Electrical equipment**	**Area wide spot heat**	**Manual pulls (at EXITs)**	**Hose racks**	**ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment, but could affect redundant train A and B nonsafety-related equipment; all safety divisions and both on-site and off-site power supplies A and B are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None, but may affect makeup water chemistry**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**1.9 m2 access required in every 15 m of exterior wall**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7400**	Description:	**Cold Machine Shop**
Building:	**Cold Machine Shop**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 90A, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class IIIB lubricants Cable insulation**	**Area wide linear heat**	**Manual pulls (at EXITs)**	**Hose racks**	**ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**1.9 m2 access required in every 15 m of exterior wall**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7500**	Description:	**Warehouse**
Building:	**Warehouse**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 72, 90A, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**S-2**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class A combustibles Cable insulation Class IIIB lubricants**	**Suppression flowswitch**	**Manual pulls at EXITs**	**Dry-pipe sprinkler 8.2 L/min per m2 over most remote 302 m2 (rack protection to be determined during detailed design)**	**ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**to be determined during detailed design**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7600**	Description:	**Training Center**
Building:	**Training Center**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 72, 75, 90A, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**B**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class A combustibles Cable insulation Computer equipment**	**Suppression flowswitch**	**Manual pulls at EXITs**	**Preaction sprinkler 4.1 L/min per m2 over most remote 182 m2**	**CO2 fire extinguishers ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700	Unsprinklered combustible load limit, MJ/m2	**Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.**

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**to be determined during detailed design**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7700**	Description:	**Service Building**
Building:	**Service**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 72, 90A, 101, 804; 28 CFR 36**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**B**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class A combustibles Cable insulation**	**Suppression flowswitch**	**Manual pulls at EXITs**	**Wet-pipe sprinkler 4.1 L/min per m2 over most remote 140 m2**	**ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; will impede access into RB/FB/CB/TB/RW**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**to be determined during detailed design**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7800**	Description:	**Auxiliary Boiler Building**
Building:	**Auxiliary Boiler**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**to be determined during detailed design**
		Electrical classification:	**to be determined during detailed design**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class IIIB lubricants Cable insulation Electrical equipment**	**Area wide spot heat**	**Manual pulls (at EXITs)**	**ABC fire extinguishers**	**Hydrants**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both on-site and off-site power supplies A and B are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; restoration required before outage**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**1.9 m2 access required in every 15 m of exterior wall**
Property loss:	**to be determined during detailed design**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F7900**	Description:	**Administration Building**
Building:	**Administration**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 72, 90A, 101, 804; 28 CFR 36**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**B**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**to be determined during detailed design**
		Except:	**to be determined during detailed design**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
to be determined during detailed design	**to be determined during detailed design**	**Class A combustibles Cable insulation**	**Suppression flowswitch**	**Manual pulls at EXITs**	**Wet-pipe sprinkler 4.1 L/min per m2 over most remote 140 m2**	**ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Property loss: Moderate

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**to be determined during detailed design**
Manual firefighting:	**to be determined during detailed design**
Property loss:	**to be determined during detailed design**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F9101**	Description:	**Uncontrolled Access**
Building:	**Tunnel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-3** **9A.2-11**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-2000 **4650**	**9101**	**Cable insulation** **Class IIIB lubricants** **Class A combustibles** **Transient combustibles**	**Area-wide ionization**	**Manual pulls (at EXITs)**	**Hose racks**	**ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2	
700	Unsprinklered combustible load limit, MJ/m2	

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safe shutdown equipment or circuits; all safety-related equipment and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; will impede access into RB, CB, and EB**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F9150**	Description:	**Cable Tunnel A**
Building:	**Tunnel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-3** **9A.2-4** **9A.2-11**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
1300 **4650**	**9150**	**Cable insulation**	**Area-wide ionization**	**Suppression flowswitch**	**Wet-pipe sprinkler** **12.2 L/min per m2** **over most remote 235 m2**	**Hose racks** **(in nearby stairwells)** **ABC fire extinguishers**

> 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train A on-site power source and related equipment; all safety divisions and train B on-site power source and related equipment are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F9160**	Description:	**Cable Tunnel B**
Building:	**Tunnel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-3** **9A.2-4**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
1300 **4650**	**9160**	**Cable insulation**	**Area-wide ionization**	**Suppression flowswitch**	**Wet-pipe sprinkler** **12.2 L/min per m2** **over most remote 235 m2**	**Hose racks** **(in nearby stairwells)** **ABC fire extinguishers**

> 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only redundant train B on-site power source and related equipment; all safety divisions and train A on-site power source and related equipment are unaffected by fire and are operable.

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F9190**	Description:	**Controlled Access**
Building:	**Tunnel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-3		Electrical classification:	**none**
9A.2-4		Safety-related divisional equipment or cables:	**none**
9A.2-11		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
1300	**9201**	**none**	**Area-wide ionization**	**Manual pulls (at EXITs)**	**Hose racks**	**ABC fire extinguishers**
4650						

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safe shutdown equipment or circuits; all safety-related equipment and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; will impede access into RB and FB**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior and interior doors**
Property loss:	**Negligible**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F9201**	Description:	**Controlled Access**
Building:	**Tunnel**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-4** **9A.2-11**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
1300 **4650**	**9201**	**Cable insulation** **Class IIIB lubricants** **Class A combustibles** **Transient combustibles**	**Area-wide ionization**	**Manual pulls (at EXITs)**	**Hose racks**	**ABC fire extinguishers**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safe shutdown equipment or circuits; all safety-related equipment and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None; will impede access into RB and FB**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F19101**	Description:	**Electric Motor Driven G21 Pump**
Building:	**Fire Pump Enclosure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 20, 24, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**none**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**exterior walls (non-rated), roof (non-rated)**

Consisting of the following Rooms:

EL	Room #	Potential Combustibles	Fire Detection: Primary	Fire Detection: Backup	Fire Suppression: Primary	Fire Suppression: Backup
4650	**19101**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pull**	**CO2 fire extinguisher**	**Hydrant**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F19150**	Description:	**Primary Electric Motor Driven Fire Pump**
Building:	**Fire Pump Enclosure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 11, 13, 20, 24, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**exterior walls (non-rated), roof (non-rated)**

Consisting of the following Rooms:

EL	Room #	Potential Combustibles	Fire Detection Primary	Fire Detection Backup	Fire Suppression Primary	Fire Suppression Backup
4650	**19150**	**Class IIIB lubricants Cable insulation**	**Suppression Flowswitch**	**Manual pull**	**Dry Pilot foam Water Sprinklers 12.2 L/min per m2 over entire area**	**Hydrant**

< 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only the electric motor-driven fire pump; remaining diesel-driven fire pump (Seismic Category I), and all safe shutdown equipment are unaffected by fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F19160**	Description:	**Primary Diesel Driven Fire Pump**
Building:	**Fire Pump Enclosure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 11, 13, 20, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**exterior walls (non-rated), roof (non-rated)**

Consisting of the following Rooms:

EL	Room #	Potential Combustibles	Fire Detection Primary	Fire Detection Backup	Fire Suppression Primary	Fire Suppression Backup
4650	**19160**	**Class IIIB lubricants Cable insulation Class II fuel oil**	**Suppression Flowswitch**	**Manual pull**	**Dry Pilot foam Water Sprinklers 12.2 L/min per m2 over entire area**	**Hydrant**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only the diesel-driven fire pump; remaining electric motor driven fire pump, (Seismic Cat II) is available and all safe shutdown equipment are unaffected by fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-7
Yard (Cont.)

Fire Area:	**F19161**	Description:	**Primary Diesel Fire Pump Fuel Oil Storage Tank**
Building:	**Fire Pump Enclosure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 11, 13, 20, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1 per IBC 307.9.5**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**19161**	**Class IIIB lubricants** **Cable insulation** **Class II fuel oil**	**Suppression Flowswitch**	**Manual pull**	**Foam Water Deluge**	**Hydrant**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area results in loss of only the diesel-driven fire pump; remaining electric motor driven fire pump, (Seismic Cat II) is available and all safe shutdown equipment are unaffected by fire and are operable. Both A and B on-site power sources are unaffected by fire and are operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via door**
Property loss:	**Minor**

Table 9A.5-7, Yard (Cont.)

Fire Area:	**F39151**	Description:	**Ancilliary Diesel Generator A/Fuel Oil Storage**
Building:	**Yard - ADB**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 15, 16, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**39151**	**Cable insulation Class IIIB lubricants 20,000L Class II fuel oil**	**Cross-zoned Ultraviolet/Infrared and spot heat**	**Suppression flowswitch**	**Preaction foam deluge 16.3 L/min per m2**	**Hydrants and ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A onsite power and related equipment and no safety-related equipment. All redundant train B onsite power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-7, Yard (Cont.)

Fire Area:	**F39161**	Description:	**Ancilliary Diesel Generator B/Fuel Oil Storage**
Building:	**Yard - ADB**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 15, 16, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**39161**	**Cable insulation Class IIIB lubricants 20,000L Class II fuel oil**	**Cross-zoned UV/IR and spot heat**	**Suppression flowswitch**	**Preaction foam deluge 16.3 L/min per m2**	**Hydrants and ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2
700	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train B onsite power and related equipment and no safety-related equipment. All redundant train A onsite power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Moderate**

Table 9A.5-7, Yard (Cont.)

Fire Area:	**F39252**	Description:	**Ancilliary Diesel Generator A**
Building:	**Yard - ADB**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**39252**	**Cable insulation Class IIIB lubricants Class II fuel oil**	**Cross-zoned UV/IR and spot heat**	**Suppression flowswitch**	**Preaction foam sprinkler 10.2 L/min per m2 over entire area**	**Hydrants and ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700	Unsprinklered combustible load limit, MJ/m2	**Complete burnout of all equipment and cables within this Fire Area affects only redundant train A onsite power and related equipment and no safety-related equipment. All redundant train B onsite power and related equipment is operable.**

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Table 9A.5-7, Yard (Cont.)

Fire Area:	**F39253**	Description:	**ADG Electrical & Control Equipment Room A**
Building:	**Yard - ADB**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**A**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**39253**	**Electrical Equipment and Cable insulation**	**Area wide ionization**	**Manual pulls**	**CO_2 fire extinguishers**	**Hydrants and ABC fire extinguishers**

> 1400	Anticipated combustible load, MJ/m2
1400	Unsprinklered combustible load limit, MJ/m2

Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects only redundant train A onsite power and related equipment and no safety-related equipment. All redundant train B onsite power and related equipment is operable.

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Table 9A.5-7, Yard (Cont.)

Fire Area:	**F39262**	Description:	**Ancilliary Diesel Generator B**
Building:	**Yard - ADB**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**39262**	**Cable insulation Class IIIB lubricants Class II fuel oil**	**Cross-zoned UV/IR and spot heat**	**Suppression flowswitch**	**Preaction foam sprinkler 10.2 L/min per m2 over entire area**	**Hydrants and ABC fire extinguishers**

> 700	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
700	Unsprinklered combustible load limit, MJ/m2	**Complete burnout of all equipment and cables within this Fire Area affects only redundant train B onsite power and related equipment and no safety-related equipment. All redundant train A onsite power and related equipment is operable.**

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

Table 9A.5-7, Yard (Cont.)

Fire Area:	**F39263**	Description:	**ADG Electrical & Control Equipment room B**
Building:	**Yard - ADB**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 16, 24, 37, 72, 101, 804**
DCD Fig:	**9A.2-33**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**B**
		Surrounded by fire barriers rated at:	**3 hours**
		Except:	**basemat (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**39263**	**Electric equipment and Cable insulation**	**Area-wide ionization**	**Manual pulls**	**CO_2 fire extinguishers**	**Hydrants and ABC fire extinguishers**

>1400	Anticipated combustible load, MJ/m2	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
1400	Unsprinklered combustible load limit, MJ/m2	**Complete burnout of all equipment and cables within this Fire Area affects only redundant train B onsite power and related equipment and no safety-related equipment. All redundant train A onsite power and related equipment is operable.**

Assuming operation of installed fire extinguishing equipment, impact of fire upon:

Plant operation:	**None**
Radiological release:	**None, no radiological materials present**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via doors**
Property loss:	**Significant**

9A.6 SPECIAL CASES

9A.6.1 Piping Penetrations, Reactor Building

Piping penetrations through the drywell wall have unique design considerations. The stress and containment requirements along with the temperature inputs to the concrete walls leave little design latitude. Some of these high-energy piping penetrations may not contain a 3-hr fire-resistive barrier as provided throughout the other ESBWR buildings. All penetrations in 3-hour fire barriers are provided with an approved penetration seal design in accordance with the guidelines of Regulatory Guide 1.189.

9A.6.2 Fire Door Deviations

The design of the nuclear facility must meet many criteria, including fire resistance. Fire doors are an example of compromise with other overriding design criteria that must also be met. Some doors, such as the airlock doors in the Reactor Building, form part of a pressure boundary and are of special construction. These doors generally have a backup fire door.

9A.6.3 Pipe Break Analyses

Per the criteria in Section 3.6, the high-pressure firewater systems require analysis for moderate energy lines.

9A.6.4 Fire Separation for Divisional Electrical Systems

There are cases where cables of more than one division are in relatively close proximity and require special justification. These areas are listed below and justification for each is provided.

9A.6.4.1 RPS Scram Circuits

Wiring to each of the four groups of scram solenoids is run in separate rigid, grounded steel conduits to prevent the possibility of exposing the scram solenoid circuits to a “hot” short (i.e., two energized switch legs of different group circuits shorted together that could inhibit the scram command to more than one group of control rods). No other wiring is contained within the conduits. Overheated conductors that are shorted to the conduits cannot cause an unsafe failure because the solenoids are de-energized by shorts to ground and thus create a safe condition. Separate grounded steel conduits are also provided for both the “A” and “B” solenoid circuits of the same scram group.

The air operated Scram Solenoid valves are part of the HCU assemblies (two solenoids per valve). They are safety-related and receive their divisional power (Division 1 or 2) from the Reactor Protection System (RPS) via the Scram Solenoid Fuse Panels. Separate fuse panels are provided for each scram group. Fuses associated with “A” and “B” solenoids of a single scram group are installed in separate panels or with appropriate separation within the same panel. Fire that causes a hot short on the cables feeding power to the scram solenoids can cause the associated fuses in the scram solenoid fuse panel to blow. The fault is limited to the loss of power to the associated solenoids and causes a half-scram or scram condition (a fail-safe condition).

The backup scram valves act as a diverse backup to the scram logic and the solenoids are safety-related. Separate divisions of 250 VDC power energize the two backup scram valves. Power supply wiring to each solenoid is individually circuit-protected and run in separate steel conduit.

9A.6.4.2 MSIV Closure Circuits

Sensors used for the main steam isolation valve (MSIV) closure (via the leak detection system) are located in the Turbine Building and in the main steamline (MSL) tunnels. These sensors are classified as Class 1E devices and use fire-retardant cabling to connect to the Main Control Room.

The safety-related devices and associated cabling are normally protected from flying objects and are physically separated. Because of the design and construction of the Turbine Building (not a Seismic Category I or a safety-related area) it is possible for these sensors and their leads to be damaged during seismic or fire events in the Turbine Building. However, a fire in the Turbine Building is sensed by the Leak Detection and Isolation System (LD&IS) temperature monitors, which causes MSIV closure before the fire burns out the equipment. No fire can propagate along the fire-retardant cabling to the control room to cause damage to power sources.

The MSIV sensors and type are:

- MSIV Condenser Vacuum Pressure transmitter located in the Turbine Building;
- MSL Turbine Inlet Pressure transmitter located in the Turbine Building;
- Main Steamline Tunnel Area Ambient Temperature element located in the MSL Tunnel; and
- Main Steamline Tunnel Area Ambient Temperature element located in the Turbine Building.

Backup trips for MSIV isolation, either directly or indirectly through the RPS, are caused by the turbine trip. Tripping of the MSIVs as a result of a fire in the Turbine Building is acceptable.

For the pressure transmitters and temperature elements, the signals are low-level analog current signals that are transmitted over a shielded, twisted pair of conductors for each transmitter. The cables are routed in separate grounded conduits on a divisional basis. Shorting together, shorting to ground, or opening a conductor in a current loop cable only affects the instrument associated with the cable. No damage occurs or propagates as a result of these potential failures.

In summary, failure of the MSIV sensors in the Turbine Building and their cables is considered acceptable because a fire results in automatic closure of the MSIVs.

9A.6.4.3 Main Steamline Tunnel Area Temperature and Radiation Monitoring

These divisional detectors are physically located in the MSL tunnel area.

By design, this area has no exposed combustibles. The conduits and the detectors have some physical protection from the steamlines and hangers in the area making it improbable that a fire from below could damage the redundant sensors or cables.

Each radiation monitor has a downscale trip such that a low reading from the detectors provides a trip. This trip is in addition to the normal upscale trip so that a failure in either direction results in a trip.

Leak detection temperature detectors of the MSL LD&IS measure ambient temperature around the MSL and provide a MSIV isolation signal at fire-induced temperatures below the threshold of damage to the radiation monitoring cable. A common failure of the radiation monitor divisional cables only affects the radiation monitors and not the remainder of the divisional equipment.

9A.6.4.4 Main Steamline ADS Relief Valves

The main steamline ADS relief valves each have three solenoid valve pilots in close proximity at the valve operator. Each solenoid is powered from a different division with all four divisions utilized for the ten valves. If either solenoid is energized, the associated relief valve opens.

The divisional signal cables are run in separate conduits from their location on the valve to the appropriate divisional penetration and via divisional raceways to their multiplex interfaces.

These valves are located in a low fire loading area and are inaccessible during plant operation such that transient fire loading is not introduced. The containment is also inerted during operation.

The conduit is arranged so that the divisional cables exit the relief valve area in diverse directions.

The solenoid valve coils are located inside metallic enclosures on each valve so that a fire inside the coil compartment of one pilot does not influence the coil or cable of the redundant pilot.

The ADS valves are arranged in two groups of four valves each with adequate spatial separation to ensure that disturbances (i.e., fire, pipe rupture phenomena, falling objects) affecting one group do not affect the other group. For line breaks requiring ADS for depressurization, the design ensures that at least four of the eight valves are available. During operation, a sustained fire is not possible in the inerted containment (drywell) area.

Electrically, the ADS logic system load drivers isolate the divisional signals from other components in their respective division, so that damage to the cable at the valves is limited to that particular cable. Electrical arcing damage to a cable or solenoid coil cannot result in inadvertent opening of the main valve because shorts, opens, or grounds at the solenoid cannot cause the solenoid to be energized. Short circuits at this location cannot jeopardize 1E power supplies because circuit resistance is sufficient to permit appropriate circuit protection coordination.

With this degree of redundancy, attention to design, electrical isolation, and containment inerting, plant safety is not compromised by having the divisional cables in close proximity at the ADS valves.

9A.6.4.5 Main Steamline Isolation Valve Control and Limit Switch Interfaces

There are eight MSIVs for isolating the MSLs, two in each MSL. The outboard MSIV on each MSL is located outside the primary containment in the main steam tunnel to the Turbine Building. The inboard MSIV on each MSL is located inside the inerted drywell.

The MSLs are arranged so that none of the valves are located vertically above any other MSIV.

The MSIVs are designed to "fail-safe" in that loss of power to both solenoids causes closure isolation. For both the inboard and outboard valves, Division 2 power actuates Solenoid 2 and Division 1 power actuates Solenoid 3. Solenoid 1 is the test solenoid and is powered by Division 1 (outboard) and Division 2 (inboard).

The appropriate division of power is connected to limit switches that open when the MSIV closes to initiate a reactor scram trip signal to the divisional scram logic, and to stop MSIV closure during MSIV exerciser tests.

The MSIVs and the 90% open (10% closure test) contacts and the 92% open (scram) contacts are classified as safety-related components and comply with the separation and isolation requirements of IEEE 603. The 10% open limit switch contact of each MSIV provides position indication to the plant computer and to indicator lights.

The inboard MSIVs are contained within the inerted environment. This feature prevents failure of this MSIV and its control and interlocking circuits from a postulated fire outside the containment providing at least one of the MSIVs in each line.

The closure of one MSIV does not result in a reactor scram. Because the outboard valve scram signals are redundant to the inboard valves on each line, a fire outside the containment does not affect the redundant capability to cause scram.

9A.6.4.6 Under the Reactor Vessel

This area contains the following electrical cables: Rod Control and Information System (RC&IS) cabling, Fine Motion Control Rod Drive (FMCRD) separation switch cables, neutron monitor system cabling, and other cables, as required. During reactor operation, the area cannot sustain fire because it is in an inerted atmosphere. All cables from the lower drywell are routed to the upper drywell via interconnecting risers. Both rigid and flexible conduit is used within the risers.

RC&IS Cables

The RC&IS cables are routed under the vessel through pull boxes inside the pedestal, then through cable boxes and raceways to electrical containment penetrations. RC&IS hard-wired cables are routed from these containment penetrations to the RC&IS Reactor Building panels located in clean areas of the Reactor Building.

All RC&IS cables under the vessel (i.e., resolver cables, FMCRD brake and motor cables, reed switch rod position status cables) are contained in flexible metallic conduit arranged in the pull boxes mounted just above the CRD restraint structure. All of these RC&IS cables are classified as nonsafety-related.

FMCRD Separation Switch Cables

The FMCRD cables for the Class 1E separation switches are classified as safety-related and separated into two groups (A and B) for routing out of the under-vessel area to two separate divisions of the safety-related multiplexing system. The cables are routed under the vessel through pull boxes inside the pedestal, then through cable boxes and raceways to electrical containment penetrations. The separation switch cables are then routed from the containment penetrations to safety-related multiplexing system panels in the Reactor Building. The

installation of these Class 1E cables is arranged so that A and B cables travel in opposite directions from under the vessel and pass through penetrations on the opposite side of the Reactor Building.

The cables receive low-voltage (48 volts) power from the safety-related multiplexing system power supplies. This provides natural circuit protection in the event of shorts or grounds on the system. Such events do not jeopardize the integrity or independence of the higher voltage divisional power buses upstream of the power supplies.

Local Power Range Monitor (LPRM) Cables

The LPRM cables are individually contained in flexible metallic conduit under the vessel. These cables are divided into four divisions of cabling, corresponding to the four divisions of the neutron monitoring system.

The cabling is also supported on the control rod drive housing flanges. The cabling is routed along particular rows of housing flanges. The Division 1 and 3 cables are routed under the vessel to the 0° to 180° half of the core, whereas Division 2 and 4 cables are routed under the vessel to the 180° to 360° half of the core. The cabling is then routed through the pedestal and drywell in enclosed solid bottom cable tray in a manner that brings: Division 1LPRM cables into the 0° to 90° quadrant of the lower drywell; Division 2 into the 180° to 270° quadrant; Division 3 into 90° to 180° quadrant; and Division 4 into the 270° and 360° quadrant. Once in the upper drywell, the cables continue in separated divisional cable raceways and penetrations.

Startup Range Neutron Monitor (SRNM) Cables

The cables for the SRNM detectors are individually contained in flexible metallic conduit. These cables are routed along with and pass through the same divisional penetrations as the LPRM cables.

Other Cables

All other cables under the pedestal are classified as non-divisional. These cables are routed in rigid or flexible metallic conduit through non-divisional conduit openings in the pedestal wall to non-divisional cable raceways in the containment.

Fire Damage Analysis

The containment is inerted during operation, so a fire is extremely unlikely. Additionally, the following tend to reduce the risk from a fire:

- A fire within a conduit is contained in the individual conduit without damage to the surrounding conduit;
- The non-divisional cabling in the conduit is low voltage, fault-protected cable and not likely to be involved in an electrically-generated fire internal to the conduit;
- The space under the reactor vessel is devoid of combustible material except for the cable insulation inside the various conduits; and
- Administrative procedures to control combustible materials are provided. (These procedures prohibit combustibles from being stored in areas with divisional cable within electrical equipment areas.)

Maintenance during reactor shutdown can involve welding in the area under the vessel. Administrative procedures require special fire protection during welding or other maintenance operations and housekeeping procedures are provided.

Therefore the design features in the area under the vessel are adequate for protecting the redundant trains from damage by fire.

9A.6.4.7 Local Instrumentation and Control Equipment

Divisional safety-related panels are generally designed and located to serve a single division. Multi-divisional panels and racks are located in divisional compartments with physical separation between divisions.

The incoming cables for each division are in separate conduit and where possible the conduit is embedded in concrete.

Some areas contain more than one division of instrumentation needed for redundant sets of equipment (e.g., isolation valves, HVAC) or for some other purpose requiring redundancy.

9A.6.4.8 Leak Detection Instrumentation

Temperatures, pressures, radiation levels, and process flows are measured to detect leakage of reactor coolant into or within the containment.

Sensors of redundant divisions are used in the plant areas to detect leakage from the reactor coolant pressure boundary and to generate signals ultimately used to provide isolation closure signals to the containment isolation valves. Sensors are part of each individual system being monitored, whereas the Leak Detection and Isolation System (LD&IS) comprises the interface between these sensors and the Safety System Logic and Control (SSLC) system to identify leakage and initiate containment isolation. Containment isolation is a safety-related function but is not necessary for post-fire safe shutdown.

The divisional sensors are located in separate detector assemblies and the signal lead cables are brought out in separate rigid (or flexible) metal conduit. The sensors are distributed within a room or along parallel piping to provide redundancy. Shorting or grounding of these cables due to postulated fire does not jeopardize the emergency power buses because the low-voltage power supplies that feed the transmitters are current-limited. Loss or spurious actuation of these signals due to a fire does not affect safe shutdown.

9A.6.4.9 Standby Liquid Control

The Standby Liquid Control System (SLC) is comprised of two independent loops. Each loop is located entirely in one fire area, and as such, a fire in one division does not damage equipment in the other division. The SLC equipment is divisionally separated except for the squib injection valves which each have two coils powered by separate safety-related DC power divisions. If a fire were to occur and damage both divisional power supplies to the squib injection valves, the effects would be limited to spurious operation or failure of the squib injection valves, and no other divisional equipment would be affected. Spurious operation or failure of the SLC system does not affect safe shutdown.

The control cabling is routed in separate conduit or trays for each division, separated from each other, to meet IEEE 384. Conduit is embedded in concrete where feasible.

Postulated fire damage that causes a hot short to the electrical cables in the SLC area could inadvertently result in injection of boron. Fire could also open the cabling to a squib valve thus preventing opening of the valve on command from the Main Control Room.

9A.6.4.10 Reactor Building Operating Deck Radiation Monitors

Radiation monitoring within this area is provided by two independent systems, the area radiation monitoring system and the process radiation monitoring system.

The Area Radiation Monitoring (ARM) system is nonsafety-related and monitors radiation in the fuel storage and handling areas. It has no system actuation function but is used for monitoring of background radiation and radiation resulting from postulated accidental fuel drops. The sensors are mounted on the walls within the fire zone area. These detectors are designed to annunciate local and control room alarms for both high and low radiation conditions. The low condition is an indication of a defective sensor or an inoperative radiation monitor. Loss of these detectors from a fire does not affect plant safety.

The Process Radiation Monitoring (PRM) channels in this area are safety-related and are used to monitor radiation in the air exhaust in the HVAC ducts. However, these sensors are not located directly in the fire area, but are on the main HVAC exhaust duct. Therefore, the sensors would not be exposed directly to an area fire, only to the exhausted smoke.

The PRM channels are designed such that any two-out-of-four signals, based on very high or very low radiation conditions within the HVAC duct, isolate the HVAC ducts in the refueling floor and the Reactor Building safety envelope area and initiate closure of the containment vent and purge ducts. The very low radiation trip assures the safety action is initiated on sensor failure.

The four divisions of PRM sensors are located within close proximity to each other to provide true two-out-of-four actuation logic. The arrangement is justified by the exhaust duct location (i.e., separate from the fire zone), and by the automatic actuation of the system's safety function should two or more sensors fail.

9A.6.4.11 Containment Isolation Valves

The primary function of each isolation valve is to isolate containment when isolation is required. In general, outboard isolation valves are assigned to Division 1 and inboard isolation valves to Division 2. In some cases this results in Division 1 outboard isolation valves being located in Division 2 areas. This is acceptable from a functional standpoint because a fire involving the penetration in an area outside of containment is assumed to disable the system, whether or not the outboard isolation valve is disabled. If the valve is open at the time of the fire it could fail in the open position, but the inboard valve is not involved in the fire and closes on demand. It is a requirement that cables for outboard valves located in fire areas of a division different than the division of the valve not be routed through fire areas containing any circuitry associated with the inboard valve of the isolation pair.

9A.6.4.12 Main Control Room Separation

All four divisions are present in the Main Control Room. In the event of a fire, the Main Control Room is evacuated and plant shutdown is controlled from the independent divisionally-separated Remote Shutdown System. Operators can evacuate the Main Control Room after scramming the reactor. The Safety System and Logic Control (SSLC) automatically actuates the safety systems. The postulated fire assumes loss of all component functions within the Main Control Room, and spurious actuations are considered in the analysis. In order to cool the plant down, the operators can control the nonsafety-related systems from either one of two Remote Shutdown System (RSS) panels, located in separate fire areas within the Reactor Building.

9A.6.4.13 Safety-Related Instrumentation in Turbine and Electrical Buildings

Safety-related devices within the Turbine Building and Electrical Building are limited to the instrumentation listed in the Table 9A.6-1.

The safety-related RPS input devices listed in the table provide a monitoring function of the measured parameter. The devices listed in Table 9A.6-1 are provided for Chapter 15, Analysis of Anticipated Operating Occurrences (Section 15.2), and, Chapter 15, Analysis of Infrequent Events (Section 15.3), and do not perform a safe-shutdown function in the event of a fire.

The cables associated with these devices are routed in individual raceways specific to their associated division, and are separated in accordance with IEEE 384 criteria and Subsection 8.3.1.4.1. Since these devices and their associated cables do not perform a safe shutdown function, complete burnout of all of these devices and their associated cables does not affect the ability to achieve and maintain post-fire safe-shutdown, as shown in the Table 9A.6-1.

9A.6.5 Comparison to BTP SBLP 9.5-1 and Regulatory Guide 1.189

The ESBWR fire protection design follows the recommendations of BTP SPLB 9.5-1 and Regulatory Guide 1.189 with the following exceptions:

9A.6.5.1 No Fire Detection within Electrical Cabinets in Main Control Room Complex

Section 7.1.4 of BTP SPLB 9.5-1 recommends that electrical cabinets should be protected as described in Regulatory Guide 1.189. Section 6.1.2.2 of Regulatory Guide 1.189 states in part:

"Smoke detectors should be provided in the control room, cabinets, and consoles."

Consoles and electrical cabinets do not have fire detectors installed inside them.

Justification: The electrical cabinets and consoles contain limited combustibles and are air-cooled so that smoke from an interior fire exhausts to the room. Early warning fire detection, primarily consisting of ionization smoke detectors, is provided in all rooms containing consoles or electrical cabinets. A fire in any single cabinet or console does not disable the capability to safely shut down the plant. Except in the Main Control Room Complex, all safety-related electrical cabinets and consoles are located in divisional rooms, and all divisional rooms are separated from each other by 3-hour fire-rated barriers such that a single fire does not affect electrical cabinets or consoles from multiple divisions. The Main Control Room Complex is continuously manned so that any fire is quickly detected and manual fire suppression activities would be initiated quickly upon discovery of a fire. In the unlikely event that a fire in the Main Control Room were to require evacuation, use of either the Division 1 or 2 Remote Shutdown

System (RSS) panel (located remotely from Main Control Room, in the Reactor Building) enables the operators to bring the reactor to a safe shut down.

9A.6.5.2 No Automatic Fire Suppression in Office Areas of Main Control Room Complex

Section C.8.1.2.c of BTP SPLB 9.5-1 recommends that automatic suppression capability should be provided in the Control Room Complex as described in Regulatory Guide 1.189. Section 6.1.2 of Regulatory Guide 1.189 states in part:

"Peripheral rooms in the control room complex should have automatic water suppression…"

The office spaces contained in the Main Control Room Complex do not have automatic fire suppression systems installed.

Justification: The Main Control Room Complex is considered to be a low risk fire area, due to the lack of high- or medium-voltage equipment and cabling. Interior finishing materials within the Main Control Room Complex are noncombustible or have a flame spread and smoke developed rating of 25 or less. The amount of transient combustibles within this fire area is limited. Papers within the Main Control Room Complex are stored in file cabinets, bookcases, or other storage locations except when in use. Ionization or photoelectric smoke detectors are installed throughout the Main Control Room Complex to provide early warning of fire during the incipient stage. The Main Control Room Complex is continuously manned so that any fire is quickly detected and manual fire suppression activities would be initiated quickly upon discovery of a fire. Should manual fire fighting in the Main Control Room Complex be necessary using either portable fire extinguishers or hand-held fire hoses, accumulation or drainage of firewater will affect the ability to safely shut the reactor down. If the firewater is assumed to transport immediately to the basement of the Control Building, the resulting accumulation of water does not affect safety-related equipment located in the basement. In either case, the fire fighting activities do not prevent the reactor from being safely shut down.

Finally, in the unlikely event that a fire in the Main Control Room were to require evacuation, use of either the Division 1 or 2 Remote Shutdown System (RSS) panel (located remotely from Main Control Room, in the Reactor Building) enables the operators to bring the reactor to a safe shut down.

9A.6.5.3 No Automatic Fire Suppression Below Raised Floor in Main Control Room Complex

Section C.8.1.2.c of BTP SPLB 9.5-1 recommends cable raceways under raised floors should be reviewed to determine if adequate fire detection and suppression are provided for potential fires in these areas. Section 6.1.2.1 of Regulatory Guide 1.189 states in part:

"...Fully enclosed electrical raceways located in under-floor and ceiling spaces, if over 0.09 m^2 (1 sq ft) in cross-sectional area, should have automatic fire suppression inside."

The Main Control Room Complex has a 0.6 meter (2 foot) deep raised floor over a subfloor volume which is used for routing of cables between the electrical cabinets, control panels, computer equipment, and the divisional electrical rooms. Divisional separation of the subfloor cabling is maintained per the requirements of IEEE 384. The subfloor volume includes full fire detection but does not include any automatic fire suppression system.

Justification: The Main Control Room Complex and subfloor volume is considered to be a low risk fire area, due to the lack of high- or medium-voltage equipment and cabling. The characteristics of the subfloor cables are such that the probability of a fire ignition is very low and any fire that were to occur would tend to be self-extinguishing. No transient combustibles are stored in the subfloor volume during normal activities would increase the severity of a possible fire. Ionization smoke detectors are installed throughout the subfloor volume to provide early warning of fire during the incipient stage. The raised floor consists of noncombustible sectional panels that can be individually removed to provide fire-fighting access to a subfloor fire. Because the Control Room is continuously manned, manual fire suppression activities would be initiated quickly upon discovery of a fire in the subfloor volume. Since fire-resistant cables are required, the amount of water needed to extinguish a fire within the subfloor volume is relatively small. Any water that is introduced into the subfloor volume can be removed by floor drains in the subfloor volume or through the use of temporary portable sump pumps. Accumulation of water in the subfloor volume is limited in depth to less than the raised floor height and does not adversely affect water sensitive safety-related equipment, which is installed above the raised floor. Effectiveness of a permanently installed fire suppression system within the subfloor volume may be somewhat limited due to the relatively small height between raised floor and top of cabling, as well as physical barriers within the subfloor volume to meet IEEE 384 separation criteria. Not including automatic fire suppression within the subfloor volume has the indirect benefit of avoiding the potential for missiles (from gaseous suppression cylinders) or flooding/wetting (from water piping) during maintenance or testing activities to affect safety-related equipment within the Main Control Room Complex.

Finally, in the unlikely event that a fire in the Main Control Room were to require evacuation, use of either the Division 1 or 2 Remote Shutdown System (RSS) panel (located remotely from Main Control Room, in the Reactor Building) enables the operators to bring the reactor to a safe shut down.

9A.6.5.4 Diesel Day Tank Capacity within Building

Section C.8.1.8.b of BTP SPLB 9.5-1 recommends that diesel day tanks comply with Regulatory Guide 1.189. Section 6.1.8 of Regulatory Guide 1.189 states in part:

"Day tanks with total capacity up to 4164 L (1100 gallons) may be located in the diesel generator area under the following conditions:

a. The day tank is located in a separate enclosure with fire resistance rating of at least 3 hours"

Based on the large size of the nonsafety-related SDGs, the capacity of each of the diesel day tanks exceeds 4164 L (1100 gallons) to allow enough fuel for at least 8 hours of diesel operation at the full load and exceeds BTP-recommended limits.

Justification: The ESBWR design includes two independent and physically separated nonsafety-related SDGs, either of which is capable of providing the full electrical load for the redundant nonsafety-related electrical buses. Neither diesel generator is necessary to achieve and maintain safe shutdown conditions for the 72-hour period following an accident or fire event. Each day tank is located in the Electrical Building in a dedicated 3-hour fire rated compartment. There is no safety-related equipment located in the same building as the day tank rooms. The day tank

rooms are located in individual fire areas adjacent to the standby Diesel Generator (DG) rooms and are positioned such that the 3-hour fire rated walls, ceiling, and floor of the day tank rooms are not common to the other redundant DG.

Each day tank room is protected by a foam-water deluge system that can deliver foam to the room for a minimum of 30 minutes without operator intervention. The day tank is seismically designed and supported. Potential ignition sources inside the day tank rooms that have enough energy to ignite diesel fuel are limited. Furthermore, the supply of fresh air to support combustion is limited. In the event of a fire, the automatic foam-water deluge system is designed to extinguish a fire in this room in 10 minutes. In the unlikely event the day tank were to fail, the entire contents of the day tank plus foam-water can be contained in the sunken volume of the day tank room. Additional foam capacity beyond 10 minutes provides added assurance that a postulated fire is extinguished.

In the event that the fuel oil transfer line from the day tank to the DG were to fail outside of the day tank room, the curbed area within the DG room can accommodate the contents of the day tank plus foam-water applied by the preaction foam-water automatic sprinkler system. This automatic sprinkler system is designed to extinguish a fire within the DG room within 10 minutes. In the unlikely event the fire is still not extinguished, the DG room can be closed off and isolated by closing doors and dampers to allow the fire to burn out on its own without spreading to other fire areas. Alternatively, if the fire brigade is required to fight the fire manually, the curbed area within the DG room can accommodate additional water/foam application from two hand-held foam hose lines before reaching the lowest door opening. The lowest door openings to these rooms are the exterior equipment doors which could be opened if fire fighting activities necessitate that overflow spill outside the building so as not to spread to other parts of the electrical building. Therefore, any overflow from the sump area of the room does not affect adjacent equipment, safe shutdown equipment, or equipment needed for support of safe shutdown equipment.

9A.6.5.5 Ancillary Diesel Fuel Oil Tank Capacity within Building

Section C.8.1.8.b of BTP SPLB 9.5-1 recommends that diesel day tanks comply with Regulatory Guide 1.189. Section 6.1.8 of Regulatory Guide 1.189 states in part:

"Day tanks with total capacity up to 4164 L (1100 gallons) may be located in the diesel generator area under the following conditions:

- The day tank is located in a separate enclosure with fire resistance rating of at least 3 hours."

The capacity of each of the Ancillary Diesel Generator (ADG) day tanks will not exceed 4164 L (1100 gallons); however, the main fuel oil storage tanks for these diesels will exceed this capacity. The main fuel oil storage tanks are located in separate fire areas in the ADB, in close proximity to the ADGs, but separated by 3-hour rated fire barriers.

Justification: The ESBWR design includes two independent and physically separated nonsafety-related ADGs capable of providing the electrical load as described in Subsection 8.3.1.1.9 and shown in Figure 8.3-3. Neither ADG is necessary to achieve and maintain safe shutdown conditions for the 72-hour period following an accident or fire event. Each fuel oil storage tank is located in the ADB in a dedicated 3-hour fire rated compartment. There is no safety-related

equipment located in the same building as the fuel oil tank rooms. Additionally, the fuel oil tank rooms are located in individual fire areas adjacent to the ADG rooms and are positioned such that the 3-hour fire rated walls, ceiling, and floor of the fuel oil storage tank room are not common to the other redundant ADG.

Each fuel oil storage tank room is protected by a foam-water deluge system that can deliver foam to the room for a minimum of 30 minutes without operator intervention. The fuel oil tank is seismically designed and supported. Potential ignition sources, with enough energy to ignite diesel fuel, are limited inside the fuel oil storage tank rooms. Furthermore, the supply of fresh air to support combustion is limited. In the event of a fire, the automatic foam-water deluge system is designed to extinguish a fire in this room in 10 minutes. In the unlikely event the fuel oil storage tank was to fail, the entire contents of the tank plus the foam-water volume can be contained within the fuel oil storage tank room. Additional foam capacity beyond 10 minutes provides added assurance that a storage fire is extinguished.

In the event that the fuel oil transfer line from the fuel oil tank to the ADG were to fail outside of the fuel oil storage tank room, the curbed area within the ADG room can accommodate the contents of the day tank plus the foam-water volume applied by the preaction foam-water automatic sprinkler system. This automatic sprinkler system is designed to extinguish a fire within the ADG room within 10 minutes. In the unlikely event the fire is still not extinguished, the ADG room can be isolated by closing doors and dampers to allow the fire to burn out on its own without spreading to other fire areas. Alternatively, if the fire brigade is required to fight the fire manually, the curbed area within the ADG room can accommodate additional water/foam application from two hand-held foam hose lines before reaching the lowest door opening. The lowest door openings to these rooms are the exterior equipment doors, which could be opened if fire fighting activities necessitate that overflow spill outside the building so as not to spread to other parts of the building. Therefore, any overflow from the sump area of the room does not affect adjacent equipment, safe shutdown equipment, or equipment needed for support of safe shutdown equipment.

9A.6.5.6 Allowing Continued Diesel-Generator Operation During a Fire

Section 8.1.8.c of BTP SPLB 9.5-1 recommends that effects of suppression systems on operating generators should be addressed in the fire hazard analysis. Section 6.1.8 of Regulatory Guide 1.189 states in part:

"Automatic fire suppression should be installed to suppress or control any diesel generator or lubricating oil fires. Such systems should be designed for operation when the diesel is running without affecting the diesel."

The automatic sprinkler systems in the standby and ancillary diesel generator rooms are installed to extinguish any fire in those rooms and do not place restrictions on the positioning and direction of the application of the fire suppressant.

Justification: The automatic sprinkler systems used in the standby and ancillary diesel generator rooms are designed to prevent inadvertent actuation by utilizing preaction automatic sprinklers . The sprinkler piping and closed-head sprinklers are pneumatically supervised for leakage, and any inadvertent actuation of the deluge valve during testing or maintenance does not result in water release due to the closed sprinkler heads.

Two actuation signals are required to automatically actuate the deluge valve, the first of which annunciates an alarm to alert the operators to any potential problems. Automatic actuation of the sprinkler system to release water requires three independent events: 1) detection of a specific range of infrared wavelengths, consistent with burning oil, by at least one infrared detector; 2) detection of a significant heat release by at least one heat detector; and, 3) opening of at least one fusible-link sprinkler head. Furthermore, each redundant standby and ancillary diesel generator has its own dedicated fire detectors and preaction deluge valve for the control of the fire sprinklers in that room, and loss of power to the deluge valve does not cause actuation.

The ESBWR design includes two independent and physically separated nonsafety-related standby diesel generators, either of which is capable of providing the full electrical load for the redundant nonsafety-related electrical buses. The ESBWR design also includes two independent and physically separated nonsafety-related ancillary diesel generators, either of which is capable of providing redundant post-accident power (Subsection 8.3.1.1.9). None of these diesel generators are necessary to achieve and maintain safe shutdown conditions for the 72-hour period following an accident or fire event. The ESBWR design also includes four independent and physically separated safety-related divisions, any two of which are capable of bringing the plant to a safe shutdown in the event of a fire. For design purposes, it is assumed that a fire anywhere in a fire area results in the immediate loss of function of all equipment associated with that division. Even with this conservative assumption, the remaining independent safety-related divisions are available for full utilization by the operators.

9A.6.5.7 No Automatic Fire Suppression in Safety-Related Computer Rooms

Section 8.1.4 of SPLB BTP 9.5-1 recommends protecting computer rooms with fire protection systems as described in Regulatory Guide 1.189. Section 6.1.4 of Regulatory Guide 1.189 states in part:

"Computer rooms for computers performing functions important to safety that are not part of the control room complex should be separated from other areas of the plant by barriers having a minimum fire resistance rating of 3 hours and should be protected by automatic detection and fixed automatic suppression."

Computer rooms containing safety-related equipment do not have fire suppression installed inside them.

Justification: Computer rooms are considered to be low-risk fire areas, due to the lack of high- or medium-voltage equipment and cabling. Interior finishing materials within computer rooms are noncombustible. The amount of transient combustibles within computer rooms is limited. Papers within computer rooms are stored in file cabinets, bookcases, or other storage locations except when in use.

Ionization smoke detectors are installed throughout computer rooms to provide early warning of fire during the incipient stage. The Main Control Room Complex is continuously manned so that any fire is quickly detected and manual fire suppression activities would be initiated quickly upon discovery of a fire in a computer room. Should manual fire fighting in a computer room be necessary using either portable fire extinguishers or hand-held fire hoses, accumulation or drainage of firewater does not affect the ability to safely shut down the reactor. If the firewater is assumed to transport immediately to the basement of the building, the resulting accumulation

of water does not affect safety-related equipment located in the basement. In either case, the fire fighting activities do not prevent the reactor from being safely shut down.

Except in the Main Control Room Complex, all safety-related computers are located in divisional rooms, and all divisional rooms are separated from each other by 3-hour fire-rated barriers such that a single fire does not affect computer equipment from multiple divisions. In the unlikely event that a fire in the Main Control Room were to require evacuation, use of either the Division 1 or 2 Remote Shutdown System (RSS) panel (located remotely from Main Control Room, in the RB) enables the operators to bring the reactor to a safe shutdown.

9A.6.5.8 Exceed Maximum Hose Length to Reach Safety-Related Equipment in Containment

Section 6.4.1 of SPLB BTP 9.5-1 recommends standpipe and hose stations meet the provisions of Regulatory Guide 1.189. Section 3.4.1 of Regulatory Guide 1.189 states in part:

"Interior manual hose installation should be able to reach any location that contains, or could present a fire exposure hazard to, equipment important to safety with at least one effective hose stream. To accomplish this, standpipes with hose connections equipped with a maximum of 30.5 m (100 feet) of 38 mm (1-1/2-inches) woven-jacket, lined fire hose and suitable nozzles should be provided in all buildings on all floors."

Standpipes and hose stations external to containment and portable extinguishers provide protection during refueling and maintenance operations. The 30.5m (100 ft) hose coverage requirement cannot be met in containment for all areas with standpipes located outside containment. ESBWR design provides for equipment in the containment to be reached by two (2) effective hose streams from fire hoses with a maximum length of 61m (200 ft) of fire hose from two (2) different standpipes located outside the containment.

Justification: Fire risk and consequences during power operations are reduced because the containment is inerted at power. Although fire damage may result to both Control Rod Drive (CRD) system and Hydraulic Control Unit (HCU) components from a postulated fire within the lower drywell during a plant outage, there would be no effect to plant safe shut down because all control rods would already have been inserted into the reactor vessel at the onset of the outage and prior to removing the inerted environment. Further backup of reactor scram capability and maintenance of safe shutdown can be provided by other systems (such as Standby Liquid Control). Based on the low safety significance and the ability to meet a fire exposure hazard from two (2) standpipes outside the containment using two (2) fire hoses, this exception is acceptable. In addition, portable extinguishers are provided for manual firefighting capability during maintenance activities introducing additional ignition sources or significant quantities of combustibles.

9A.6.6 Comparison to International Building Code

The ESBWR fire protection design follows the IBC requirements with the following exceptions. Nonetheless, these "alternative methods" of fire protection for unsprinklered Reactor, Control, and Fuel Buildings as well as unsprinklered portions of the Turbine and Electrical Buildings would require approval from the building code authority during the building permit process as allowed by Section 104.11 of the IBC.

9A.6.6.1 Underground Structures without Sprinkler Protection

Section 405.3 of the International Building Code (IBC) requires automatic sprinkler protection throughout all underground levels where the lowest level is more than 9.144 m (30.0 ft) below grade. The lowest levels of the Reactor and Fuel Buildings are more than 16 m (52.5 ft) below grade, and the lowest level of the Control Building is more than 12 m (39.4 ft) below grade. In compliance with NFPA 804 and Regulatory Guide 1.189, no sprinkler protection is provided for these levels. This is acceptable for the following reasons:

- Noncombustible Type I-A concrete construction in these buildings;
- Use of Class A finishes and avoidance of combustible materials where possible;
- Extensive use of 3-hr fire-rated walls and floors which subdivide the buildings (this exceeds the IBC minimum requirement for fire-rated separation of similar occupancies);
- 3-hr fire-rated stairwell enclosures, which exceed both the NFPA 101 and IBC minimum requirements for enclosure of exits and the NFPA 14 minimum requirement for protection of standpipes;
- As shown in Tables 9A.5-1, 9A.5-2, and 9A.5-3, low fire loadings (<1400 MJ/m^2 [123,280 Btu/ft^2]) within the underground electrical rooms in the Reactor, Fuel, and Control Buildings;
- As shown in Tables 9A.5-1, 9A.5-2, and 9A.5-3, low fire loadings (<700 MJ/m^2 [61,640 Btu/ft^2]) within the unsprinklered underground non-electrical rooms in the Reactor, Fuel, and Control Buildings;
- Complete Class A supervised fire detection throughout the Reactor, Fuel, and Control Buildings, which exceeds the IBC minimum requirement for similar occupancies (these initiate a fire alarm signal to the constantly manned Control Room);
- Complete coverage from Class III standpipe and hose systems, throughout the Reactor, Control, and Fuel Buildings, which exceeds the IBC minimum requirement for similar occupancies; and
- Trained industrial fire brigade on-site at all times, which exceeds the IBC minimum requirement for similar occupancies.

9A.6.6.2 Buildings Containing Large Fire Areas, without Sprinkler Protection

Section 903.2.3.1 of the IBC requires automatic sprinkler protection throughout buildings that contain a single Group F-1 occupancy fire area that exceeds 1115 m^2 (12002 ft^2). The unsprinklered Reactor Building contains fire area F1600 which exceeds 1115 m^2 (12002 ft^2); the unsprinklered Fuel Building contains fire area F2100 which exceeds 1115 m^2 (12002 ft^2); and the partially sprinklered Turbine Building contains fire area F4197 which exceeds 1115 m^2 (12002 ft^2).

Additionally, section 903.2.3.3 of the IBC requires automatic sprinkler protection throughout buildings where the combined floor area of all Group F-1 occupancy fire areas exceeds 2230 m^2 (24004 ft^2). The unsprinklered Reactor Building, unsprinklered Fuel Building, and partially

sprinklered Turbine Building each contain multiple F-1 fire areas that cumulatively exceed 2230 m^2 (24004 ft^2).

In compliance with NFPA 804 and Regulatory Guide 1.189, no sprinkler protection is provided for these buildings. This is acceptable for the following reasons:

- Noncombustible Type I-A concrete construction in these buildings;
- Use of Class A finishes and avoidance of combustible materials where possible;
- Extensive use of 3-hr fire-rated walls and floors which subdivide the buildings (this exceeds the IBC minimum requirement for fire-rated separation of similar occupancies);
- 3-hr fire-rated stairwell enclosures, which exceed both the NFPA 101 and IBC minimum requirements for enclosure of exits and the NFPA 14 minimum requirement for protection of standpipes;
- As shown in Tables 9A.5-1 and 9A.5-2, low fire loadings (<700 MJ/m^2 [61,640 Btu/ft^2]) within the fire areas F1600 and F2100 in the Reactor and Fuel Buildings;
- As shown in Table 9A.5-4, low fire loadings (<700 MJ/m^2 [61,640 Btu/ft^2]) within the unsprinklered portion of the Turbine Building fire area F4197;
- As shown in Table 9A.5-4, automatic fire suppression throughout Turbine Building rooms that contain significant fire hazards (>700 MJ/m^2 [61,640 Btu/ft^2]) (these consist of sprinkler, deluge, or carbon dioxide flooding systems that each initiate a fire alarm signal to the constantly manned Control Room);
- Complete Class A supervised fire detection throughout the Reactor, Fuel, and Turbine Buildings, which exceeds the IBC minimum requirement for similar occupancies (these initiate a fire alarm signal to the constantly manned Control Room);
- Complete coverage from Class III standpipe and hose systems, throughout the Reactor, Control, and Turbine Buildings, which exceeds the IBC minimum requirement for similar occupancies;
- Trained industrial fire brigade on-site at all times, which exceeds the IBC minimum requirement for similar occupancies;
- Sprinklers installed under the very tall ceilings in fire areas F1600, F1601, F2100, and F4197 would be ineffective against a floor level fire (the extreme height would likely prevent sufficient heat from reaching sprinkler heads to actuate them); and
- Subdividing fire areas F1600, F2100, and F4197 into fire areas less than 1115 m^2 (12002 ft^2 in size) size is not feasible due to the large machinery and access requirements in these areas.

9A.6.6.3 Building Containing Fire Areas more than Three Stories Above Grade, without Sprinkler Protection

Section 903.2.3.2 of the IBC requires automatic sprinkler protection throughout buildings that contain a single Group F-1 occupancy fire area that is located more than three stories above grade. Elevation 34000 of the unsprinklered Reactor Building is located more than three stories

above grade. Elevations 22000 and 27000 of the partially sprinklered Electrical Building are both located more than three stories above grade.

In compliance with NFPA 804 and Regulatory Guide 1.189, no sprinkler protection is provided for these levels. This is acceptable for the following reasons:

- Noncombustible Type I-A concrete construction in these buildings;
- Use of Class A finishes and avoidance of combustible materials where possible;
- Extensive use of 3-hr fire-rated walls and floors which subdivide the buildings (this exceeds the IBC minimum requirement for fire-rated separation of similar occupancies);
- 3-hr fire-rated stairwell enclosures, which exceed both the NFPA 101 and IBC minimum requirements for enclosure of exits and the NFPA 14 minimum requirement for protection of standpipes;
- As shown in Tables 9A.5-1 and 9A.5-6, low fire loadings (<1400 MJ/m^2 [123,280 Btu/ft^2]) within the unsprinklered electrical rooms in the Reactor and Electrical Buildings;
- As shown in Tables 9A.5-1 and 9A.5-6, low fire loadings (<700 MJ/m^2 [61,640 Btu/ft^2]) within the unsprinklered non-electrical rooms in the Reactor and Electrical Buildings;
- As shown in Table 9A.5-6, automatic fire suppression throughout Electrical Building non-electrical rooms that contain significant fire hazards (>700 MJ/m^2 [61,640 Btu/ft^2]) (these consist of sprinkler or deluge systems that each initiate a fire alarm signal to the constantly manned Control Room);
- Complete Class A supervised fire detection throughout the Reactor and Electrical Buildings, which exceeds the IBC minimum requirement for similar occupancies (these initiate a fire alarm signal to the constantly manned Control Room);
- Complete coverage from Class III standpipe and hose systems throughout the Reactor and Electrical Buildings, which exceeds the IBC minimum requirement for similar occupancies;
- Trained industrial fire brigade on-site at all times, which exceeds the IBC minimum requirement for similar occupancies; and
- Sprinklers installed under the very tall ceiling in Elevation 34000 of the Reactor Building would be ineffective against a floor level fire (the extreme height would likely prevent sufficient heat from reaching sprinkler heads to actuate them).

9A.6.6.4 Lack of Fire Fighter Exterior Access Openings, without Sprinkler Protection

Section 903.2.10 of the IBC requires automatic sprinkler protection throughout buildings that do not have 1.9 m^2 (20.5 ft^2) minimum size openings (doors or windows) within each 15 m (49.2 ft) of exterior wall. These openings are intended for fire fighter access into the building during a fire. The exterior walls of the Reactor, Fuel, and Control Buildings do not contain such openings. In compliance with NFPA 804 and Regulatory Guide 1.189, no sprinkler protection is provided for these buildings. This is acceptable for the following reasons:

- Noncombustible Type I-A concrete construction in these buildings;

- Use of Class A finishes and avoidance of combustible materials where possible;
- Extensive use of 3-hr fire-rated walls and floors which subdivide the buildings (this exceeds the IBC minimum requirement for fire-rated separation of similar occupancies);
- 3-hr fire-rated stairwell enclosures, which exceed both the NFPA 101 and IBC minimum requirements for enclosure of exits and the NFPA 14 minimum requirement for protection of standpipes;
- As shown in Tables 9A.5-1, 9A.5-2, and 9A.5-3, low fire loadings (<1400 MJ/m^2 [123,280 Btu/ft^2]) within the underground electrical rooms in the Reactor, Fuel, and Control Buildings;
- As shown in Tables 9A.5-1, 9A.5-2, and 9A.5-3, low fire loadings (<700 MJ/m^2 [61,640 Btu/ft^2]) within the unsprinklered underground non-electrical rooms in the Reactor, Fuel, and Control Buildings;
- Complete Class A supervised fire detection throughout the Reactor, Fuel, and Control Buildings, which exceeds the IBC minimum requirement for similar occupancies (these initiate a fire alarm signal to the constantly manned Control Room);
- Complete coverage from Class III standpipe and hose systems, throughout the Reactor, Control, and Fuel Buildings, which exceeds the IBC minimum requirement for similar occupancies;
- Trained industrial fire brigade on-site at all times, which exceeds the IBC minimum requirement for similar occupancies; and
- Adding enough exterior openings to comply with IBC Subsection 90.3.2.10 would impose an unacceptable security risk.

Table 9A.6-1

Turbine and Electrical Building Safety-Related Monitoring Devices

Parameter Description	RPS Input or Output	Parameter Measuring or Actuating Device	Building	Room	Divisions	Total Burnout Impact With No Hot Short	Total Burnout Impact With Hot Short
Condenser Vacuum	Input	Transmitter (Analog signal between upper and lower limits)	TB	4392	1, 2, 3, 4	Indication to RPS of Loss of Condenser Vacuum; Refer to Subsection 15.2.2.8	Indication to RPS of Loss of Condenser Vacuum; Refer to Subsection 15.2.2.8
Main Steam Line Pressure	Input	Transmitter (Analog signal between upper and lower limits)	TB	4390	1, 2, 3, 4	Indication to RPS of Closure of All Main Steamline Isolation Valves; Refer to Subsection 15.2.2.7	Indication to RPS of Closure of All Main Steamline Isolation Valves; Refer to Subsection 15.2.2.7
Turbine Bypass Valve Position	Input	Position Switch	TB	4391 and 4392	1, 2, 3, 4	Indication to RPS of Turbine Bypass Valves Opening; Refer to Subsection 15.3.3.1	Loss of RPS Ability to Monitor Turbine Bypass Valve Position
Turbine Stop Valve Position	Input	Position Switch	TB	4380	1, 2, 3, 4	Indication to RPS of Turbine Stop Valves Closing; Refer to Subsections 15.3.6.1	Loss of RPS Ability to Monitor Turbine Stop Valve Position

Table 9A.6-1

Turbine and Electrical Building Safety-Related Monitoring Devices (continued)

Parameter Description	RPS Input or Output	Parameter Measuring or Actuating Device	Building	Room	Divisions	Total Burnout Impact With No Hot Short	Total Burnout Impact With Hot Short
Turbine Control Valve Hydraulic Trip System Oil Pressure	Input	Transmitter (Analog signal between upper and lower limits)	TB	4506 and 4507	1, 2, 3, 4	Indication to RPS of Turbine Control Valves Closing; Refer to Subsection 15.3.4.1	Indication to RPS of Turbine Control Valves Closing; Refer to Subsection 15.3.4.1
Turbine Area Temperatures (Main Steam Leak Detection)	Input	Temperature Elements (Analog signal between upper and lower limits)	TB	4390 and 4393	1, 2, 3, 4	Indication to RPS of Main Steamline Leak; Refer to Subsections 9A.6.4.2 and 15.2.2.7	Indication to RPS of Main Steamline Leak; Refer to Subsections 9A.6.4.2 and 15.2.2.7

Table 9A.6-1
Turbine and Electrical Building Safety-Related Monitoring Devices (continued)

Parameter Description	RPS Input or Output	Parameter Measuring or Actuating Device	Building	Room	Divisions	Total Burnout Impact With No Hot Short	Total Burnout Impact With Hot Short
13.8 kV Bus Under voltage	Input	Transducer	TB	4500	1, 2, 3, 4	Indication to RPS of 13.8 kV Bus under voltage resulting in a scram; refer to Subsection 15.2.5.2	Indication to RPS of 13.8 kV Bus under voltage resulting in a scram; refer to Subsection 15.2.5.2

Note 1: There are no safety-related monitoring devices located in the Electrical Building

9A.7 COL INFORMATION

9A.7-1-A Yard Fire Zone Drawings

The COL applicant shall include fire zone drawings for those portions of the Yard except for that associated with Turbine and Electrical Building equipment (Subsection 9A.4.7).

9A.7-2-A Fire Hazards Analysis for Site Specific Areas

A more detailed evaluation of the Service Water/Water Treatment Building, Service Building and the Yard Area will be added during the COL application for a specific site (Subsection 9A.4.7).