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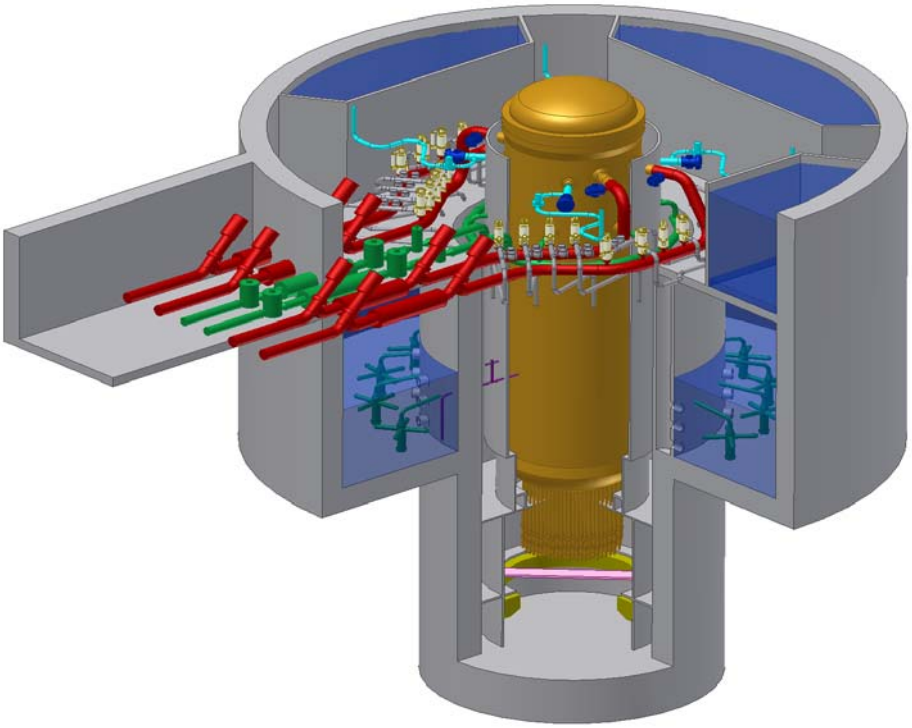

ESBWR Design Control Document

Tier 2

Chapter 9

Auxiliary Systems

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Global Abbreviations And Acronyms List

Term	Definition
10 CFR	Title 10, Code of Federal Regulations
A/D	Analog-to-Digital
AASHTO	American Association of Highway and Transportation Officials
AB	Auxiliary Boiler
ABS	Auxiliary Boiler System
ABWR	Advanced Boiling Water Reactor
ac / AC	Alternating Current
AC	Air Conditioning
ACF	Automatic Control Function
ACI	American Concrete Institute
ACS	Atmospheric Control System
AD	Administration Building
ADS	Automatic Depressurization System
AEC	Atomic Energy Commission
AFIP	Automated Fixed In-Core Probe
AGMA	American Gear Manufacturer's Association
AHS	Auxiliary Heat Sink
AHU	Air handling unit
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AL	Analytical Limit
ALARA	As Low As Reasonably Achievable
ALWR	Advanced Light Water Reactor
ANS	American Nuclear Society
ANSI	American National Standards Institute
AOO	Anticipated Operational Occurrence
AOV	Air Operated Valve
API	American Petroleum Institute
APRM	Average Power Range Monitor
APR	Automatic Power Regulator
APRS	Automatic Power Regulator System
ARI	Alternate Rod Insertion
ARMS	Area Radiation Monitoring System
ASA	American Standards Association
ASD	Adjustable Speed Drive
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers

Global Abbreviations And Acronyms List

Term	Definition
AST	Alternate Source Term
ASTM	American Society of Testing Methods
AT	Unit Auxiliary Transformer
ATLM	Automated Thermal Limit Monitor
ATWS	Anticipated Transients Without Scram
AV	Allowable Value
AWS	American Welding Society
AWWA	American Water Works Association
B&PV	Boiler and Pressure Vessel
BAF	Bottom of Active Fuel
BHP	Brake Horse Power
BOP	Balance of Plant
BPU	Bypass Unit
BPWS	Banked Position Withdrawal Sequence
BRE	Battery Room Exhaust
BRL	Background Radiation Level
BTP	NRC Branch Technical Position
BTU	British Thermal Unit
BWR	Boiling Water Reactor
BWROG	Boiling Water Reactor Owners Group
CAV	Cumulative absolute velocity
C&FS	Condensate and Feedwater System
C&I	Control and Instrumentation
C/C	Cooling and Cleanup
CB	Control Building
CBGAVS	Control Building General Area HVAC Sub-system
CBVS	Control Building HVAC System
CCI	Core-Concrete Interaction
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CIRC	Circulating Water System
CIS	Containment Inerting System
CIV	Combined Intermediate Valve
CLAVS	Reactor Building Clean Area HVAC Sub-system
CM	Cold Machine Shop
CMS	Containment Monitoring System
CMU	Control Room Multiplexing Unit

Global Abbreviations And Acronyms List

Term	Definition
COL	Combined Operating License
COLR	Core Operating Limits Report
CONAVS	Reactor Building Contaminated Area HVAC Sub-system
CPR	Critical Power Ratio
CPS	Condensate Purification System
CPU	Central Processing Unit
CR	Control Rod
CRD	Control Rod Drive
CRDA	Control Rod Drop Accident
CRDH	Control Rod Drive Housing
CRDHS	Control Rod Drive Hydraulic System
CRGT	Control Rod Guide Tube
CRHA	Control Room Habitability Area
CRHAVS	Control Room Habitability Area HVAC Sub-system
CRT	Cathode Ray Tube
CS&TS	Condensate Storage and Transfer System
CSDM	Cold Shutdown Margin
CS / CST	Condensate Storage Tank
CT	Main Cooling Tower
CTVCF	Constant Voltage Constant Frequency
CUF	Cumulative usage factor
CWS	Chilled Water System
D-RAP	Design Reliability Assurance Program
DAC	Design Acceptance Criteria
DAW	Dry Active Waste
DBA	Design Basis Accident
dc / DC	Direct Current
DCS	Drywell Cooling System
DCIS	Distributed Control and Information System
DEPSS	Drywell Equipment and Pipe Support Structure
DF	Decontamination Factor
D/F	Diaphragm Floor
DG	Diesel-Generator
DGVS	Electrical Building Diesel Generators HVAC Sub-system
DHR	Decay Heat Removal
DM&C	Digital Measurement and Control
DOF	Degree of freedom

Global Abbreviations And Acronyms List

Term	Definition
DOI	Dedicated Operators Interface
DOT	Department of Transportation
dPT	Differential Pressure Transmitter
DPS	Diverse Protection System
DPV	Depressurization Valve
DR&T	Design Review and Testing
DS	Independent Spent Fuel Storage Installation
DTM	Digital Trip Module
DW	Drywell
EB	Electrical Building
EBAS	Emergency Breathing Air System
EBVS	Electrical Building HVAC System
ECCS	Emergency Core Cooling System
E-DCIS	Essential DCIS (Distributed Control and Information System)
EDO	Environmental Qualification Document
EER	Electrical Building Electric and Electronic Rooms
EERVS	Electrical Building Electric and Electronic Rooms HVAC Sub-system
EFDS	Equipment and Floor Drainage System
EFPY	Effective full power years
EFU	Emergency Filter Unit
EHC	Electrohydraulic Control (Pressure Regulator)
ENS	Emergency Notification System
EOC	Emergency Operations Center
EOC	End of Cycle
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedures
EPDS	Electric Power Distribution System
EPG	Emergency Procedure Guidelines
EPRI	Electric Power Research Institute
EQ	Environmental Qualification
ERICP	Emergency Rod Insertion Control Panel
ERIP	Emergency Rod Insertion Panel
ESF	Engineered Safety Feature
ETS	Emergency Trip System
FAC	Flow-Accelerated Corrosion
FAPCS	Fuel and Auxiliary Pools Cooling System
FATT	Fracture Appearance Transition Temperature
FB	Fuel Building

Global Abbreviations And Acronyms List

Term	Definition
FBFPVS	Fuel Building Fuel Pool Area HVAC Sub-system
FBGAVS	Fuel Building General Area HVAC Sub-system
FBVS	Fuel Building HVAC System
FCI	Fuel-Coolant Interaction
FCM	File Control Module
FCS	Flammability Control System
FCU	Fan Cooling Unit
FDDI	Fiber Distributed Data Interface
FFT	Fast Fourier Transform
FFWTR	Final Feedwater Temperature Reduction
FHA	Fire Hazards Analysis
FIV	Flow-Induced Vibration
FMCRD	Fine Motion Control Rod Drive
FMEA	Failure Modes and Effects Analysis
FPS	Fire Protection System
FO	Diesel Fuel Oil Storage Tank
FOAKE	First-of-a-Kind Engineering
FPE	Fire Pump Enclosure
FTDC	Fault-Tolerant Digital Controller
FTS	Fuel Transfer System
FW	Feedwater
FWCS	Feedwater Control System
FWS	Fire Water Storage Tank
GCS	Generator Cooling System
GDC	General Design Criteria
GDCS	Gravity-Driven Cooling System
GE	General Electric Company
GE-NE	GE Nuclear Energy
GEN	Main Generator System
GETAB	General Electric Thermal Analysis Basis
GL	Generic Letter
GM	Geiger-Mueller Counter
GM-B	Beta-Sensitive GM Detector
GSIC	Gamma-Sensitive Ion Chamber
GSOS	Generator Sealing Oil System
GWSR	Ganged Withdrawal Sequence Restriction
HAZ	Heat-Affected Zone
HCU	Hydraulic Control Unit

Global Abbreviations And Acronyms List

Term	Definition
HCW	High Conductivity Waste
HDVS	Heater Drain and Vent System
HEI	Heat Exchange Institute
HELB	High Energy Line Break
HEP	Human error probability
HEPA	High Efficiency Particulate Air/Absolute
HFE	Human Factors Engineering
HFF	Hollow Fiber Filter
HGCS	Hydrogen Gas Cooling System
HIC	High Integrity Container
HID	High Intensity Discharge
HIS	Hydraulic Institute Standards
HM	Hot Machine Shop & Storage
HP	High Pressure
HPNSS	High Pressure Nitrogen Supply System
HPT	High-pressure turbine
HRA	Human Reliability Assessment
HSI	Human-System Interface
HSSS	Hardware/Software System Specification
HVAC	Heating, Ventilation and Air Conditioning
HVS	High Velocity Separator
HWC	Hydrogen Water Chemistry
HWCS	Hydrogen Water Chemistry System
HWS	Hot Water System
HX	Heat Exchanger
I&C	Instrumentation and Control
I/O	Input/Output
IAS	Instrument Air System
IASCC	Irradiation Assisted Stress Corrosion Cracking
IBC	International Building Code
IC	Ion Chamber
IC	Isolation Condenser
ICD	Interface Control Diagram
ICS	Isolation Condenser System
IE	Inspection and Enforcement
IEB	Inspection and Enforcement Bulletin
IED	Instrument and Electrical Diagram
IEEE	Institute of Electrical and Electronic Engineers

Global Abbreviations And Acronyms List

Term	Definition
IFTS	Inclined Fuel Transfer System
IGSCC	Intergranular Stress Corrosion Cracking
IIS	Iron Injection System
ILRT	Integrated Leak Rate Test
IOP	Integrated Operating Procedure
IMC	Induction Motor Controller
IMCC	Induction Motor Controller Cabinet
IRM	Intermediate Range Monitor
ISA	Instrument Society of America
ISI	In-Service Inspection
ISLT	In-Service Leak Test
ISM	Independent Support Motion
ISMA	Independent Support Motion Response Spectrum Analysis
ISO	International Standards Organization
ITA	Inspections, Tests or Analyses
ITAAC	Inspections, Tests, Analyses and Acceptance Criteria
ITA	Initial Test Program
LAPP	Loss of Alternate Preferred Power
LCO	Limiting Conditions for Operation
LCW	Low Conductivity Waste
LD	Logic Diagram
LDA	Lay down Area
LD&IS	Leak Detection and Isolation System
LERF	Large early release frequency
LFCV	Low Flow Control Valve
LHGR	Linear Heat Generation Rate
LLRT	Local Leak Rate Test
LMU	Local Multiplexer Unit
LO	Dirty/Clean Lube Oil Storage Tank
LOCA	Loss-of-Coolant-Accident
LOFW	Loss-of-feedwater
LOOP	Loss of Offsite Power
LOPP	Loss of Preferred Power
LP	Low Pressure
LPCI	Low Pressure Coolant Injection
LPCRD	Locking Piston Control Rod Drive
LPMS	Loose Parts Monitoring System
LPRM	Local Power Range Monitor

Global Abbreviations And Acronyms List

Term	Definition
LPSP	Low Power Setpoint
LWMS	Liquid Waste Management System
MAAP	Modular Accident Analysis Program
MAPLHGR	Maximum Average Planar Linear Head Generation Rate
MAPRAT	Maximum Average Planar Ratio
MBB	Motor Built-In Brake
MCC	Motor Control Center
MCES	Main Condenser Evacuation System
MCPR	Minimum Critical Power Ratio
MCR	Main Control Room
MCRP	Main Control Room Panel
MELB	Moderate Energy Line Break
MLHGR	Maximum Linear Heat Generation Rate
MMI	Man-Machine Interface
MMIS	Man-Machine Interface Systems
MOV	Motor-Operated Valve
MPC	Maximum Permissible Concentration
MPL	Master Parts List
MS	Main Steam
MSIV	Main Steam Isolation Valve
MSL	Main Steamline
MSLB	Main Steamline Break
MSLBA	Main Steamline Break Accident
MSR	Moisture Separator Reheater
MSV	Mean Square Voltage
MT	Main Transformer
MTTR	Mean Time To Repair
MWS	Makeup Water System
NBR	Nuclear Boiler Rated
NBS	Nuclear Boiler System
NCIG	Nuclear Construction Issues Group
NDE	Nondestructive Examination
NE-DCIS	Non-Essential Distributed Control and Information System
NDRC	National Defense Research Committee
NDT	Nil Ductility Temperature
NFPA	National Fire Protection Association
NIST	National Institute of Standard Technology
NICWS	Nuclear Island Chilled Water Subsystem

Global Abbreviations And Acronyms List

Term	Definition
NMS	Neutron Monitoring System
NOV	Nitrogen Operated Valve
NPHS	Normal Power Heat Sink
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
NRHX	Non-Regenerative Heat Exchanger
NS	Non-seismic
NSSS	Nuclear Steam Supply System
NT	Nitrogen Storage Tank
NTSP	Nominal Trip Setpoint
O&M	Operation and Maintenance
O-RAP	Operational Reliability Assurance Program
OBCV	Overboard Control Valve
OBE	Operating Basis Earthquake
OGS	Offgas System
OHLHS	Overhead Heavy Load Handling System
OIS	Oxygen Injection System
OLMCPR	Operating Limit Minimum Critical Power Ratio
OLU	Output Logic Unit
OOS	Out-of-service
ORNL	Oak Ridge National Laboratory
OSC	Operational Support Center
OSHA	Occupational Safety and Health Administration
OSI	Open Systems Interconnect
P&ID	Piping and Instrumentation Diagram
PA/PL	Page/Party-Line
PABX	Private Automatic Branch (Telephone) Exchange
PAM	Post Accident Monitoring
PAR	Passive Autocatalytic Recombiner
PAS	Plant Automation System
PASS	Post Accident Sampling Subsystem of Containment Monitoring System
PCC	Passive Containment Cooling
PCCS	Passive Containment Cooling System
PCT	Peak cladding temperature
PCV	Primary Containment Vessel
PFD	Process Flow Diagram
PGA	Peak Ground Acceleration
PGCS	Power Generation and Control Subsystem of Plant Automation System

Global Abbreviations And Acronyms List

Term	Definition
PH	Pump House
PL	Parking Lot
PM	Preventive Maintenance
PMCS	Performance Monitoring and Control Subsystem of NE-DCIS
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
PQCL	Product Quality Check List
PRA	Probabilistic Risk Assessment
PRMS	Process Radiation Monitoring System
PRNM	Power Range Neutron Monitoring
PS	Plant Stack
PSD	Power Spectra Density
PSS	Process Sampling System
PSWS	Plant Service Water System
PT	Pressure Transmitter
PWR	Pressurized Water Reactor
QA	Quality Assurance
RACS	Rod Action Control Subsystem
RAM	Reliability, Availability and Maintainability
RAPI	Rod Action and Position Information
RAT	Reserve Auxiliary Transformer
RB	Reactor Building
RBC	Rod Brake Controller
RBCC	Rod Brake Controller Cabinet
RBCWS	Reactor Building Chilled Water Subsystem
RBS	Rod Block Setpoint
RBV	Reactor Building Vibration
RBVS	Reactor Building HVAC System
RC&IS	Rod Control and Information System
RCC	Remote Communication Cabinet
RCCV	Reinforced Concrete Containment Vessel
RCCWS	Reactor Component Cooling Water System
RCPB	Reactor Coolant Pressure Boundary
RCS	Reactor Coolant System
RDA	Rod Drop Accident
RDC	Resolver-to-Digital Converter
REPAVS	Reactor Building Refueling and Pool Area HVAC Sub-system

Global Abbreviations And Acronyms List

Term	Definition
RFP	Reactor Feed Pump
RG	Regulatory Guide
RHR	Residual heat removal (function)
RHX	Regenerative Heat Exchanger
RMS	Root Mean Square
RMS	Radiation Monitoring Subsystem
RMU	Remote Multiplexer Unit
RO	Reverse Osmosis
ROM	Read-only Memory
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RRPS	Reference Rod Pull Sequence
RSM	Rod Server Module
RSPC	Rod Server Processing Channel
RSS	Remote Shutdown System
RSSM	Reed Switch Sensor Module
RSW	Reactor Shield Wall
RTIF	Reactor Trip and Isolation Function(s)
RT_{NDT}	Reference Temperature of Nil-Ductility Transition
RTP	Reactor Thermal Power
RW	Radwaste Building
RWCR	Radwaste Building Control Room
RWCRVS	Radwaste Building Control Room HVAC Sub-system
RWGA	Radwaste Building General Area
RWGAVS	Radwaste Building General Area HVAC Sub-system
RWVS	Radwaste Building HVAC System
RWCU/SDC	Reactor Water Cleanup/Shutdown Cooling
RWE	Rod Withdrawal Error
RWM	Rod Worth Minimizer
SA	Severe Accident
SAR	Safety Analysis Report
SB	Service Building
S/C	Digital Gamma-Sensitive GM Detector
SC	Suppression Chamber
S/D	Scintillation Detector
S/DRSRO	Single/Dual Rod Sequence Restriction Override
S/N	Signal-to-Noise
S/P	Suppression Pool

Global Abbreviations And Acronyms List

Term	Definition
SAS	Service Air System
SB&PC	Steam Bypass and Pressure Control System
SBO	Station Blackout
SBWR	Simplified Boiling Water Reactor
SCEW	System Component Evaluation Work
SCRRI	Selected Control Rod Run-in
SDC	Shutdown Cooling
SDM	Shutdown Margin
SDS	System Design Specification
SEOA	Sealed Emergency Operating Area
SER	Safety Evaluation Report
SF	Service Water Building
SFP	Spent fuel pool
SIL	Service Information Letter
SIT	Structural Integrity Test
SIU	Signal Interface Unit
SJAE	Steam Jet Air Ejector
SLC	Standby Liquid Control
SLCS	Standby Liquid Control System
SLMCPR	Safety Limit Minimum Critical Power Ratio
SMU	SSLC Multiplexing Unit
SOV	Solenoid Operated Valve
SP	Setpoint
SPC	Suppression Pool Cooling
SPDS	Safety Parameter Display System
SPTMS	Suppression Pool Temperature Monitoring Subsystem of Containment Monitoring System
SR	Surveillance Requirement
SRM	Source Range Monitor
SRNM	Startup Range Neutron Monitor
SRO	Senior Reactor Operator
SRP	Standard Review Plan
SRS	Software Requirements Specification
SRSRO	Single Rod Sequence Restriction Override
SRSS	Sum of the squares
SRV	Safety Relief Valve
SRVDL	Safety relief valve discharge line
SSAR	Standard Safety Analysis Report
SSC(s)	Structure, System and Component(s)

Global Abbreviations And Acronyms List

Term	Definition
SSE	Safe Shutdown Earthquake
SSLC	Safety System Logic and Control
SSPC	Steel Structures Painting Council
ST	Spare Transformer
STP	Sewage Treatment Plant
STRAP	Scram Time Recording and Analysis Panel
STRP	Scram Time Recording Panel
SV	Safety Valve
SWH	Static water head
SWMS	Solid Waste Management System
SY	Switch Yard
TAF	Top of Active Fuel
TASS	Turbine Auxiliary Steam System
TB	Turbine Building
TBCE	Turbine Building Compartment Exhaust
TEAS	Turbine Building Air Supply
TBE	Turbine Building Exhaust
TBLOE	Turbine Building Lube Oil Area Exhaust
TBS	Turbine Bypass System
TBV	Turbine Bypass Valve
TBVS	Turbine Building HVAC System
TC	Training Center
TCCWS	Turbine Component Cooling Water System
TCS	Turbine Control System
TCV	Turbine Control Valve
TDH	Total Developed Head
TEMA	Tubular Exchanger Manufacturers' Association
TFSP	Turbine first stage pressure
TG	Turbine Generator
TGSS	Turbine Gland Seal System
THA	Time-history accelerograph
TLOS	Turbine Lubricating Oil System
TLU	Trip Logic Unit
TMI	Three Mile Island
TMSS	Turbine Main Steam System
TRM	Technical Requirements Manual
TS	Technical Specification(s)

Global Abbreviations And Acronyms List

Term	Definition
TSC	Technical Support Center
TSCVS	Electrical Building Technical Support Center HVAC Sub-system
TSI	Turbine Supervisory Instrument
TSV	Turbine Stop Valve
UBC	Uniform Building Code
UHS	Ultimate heat sink
UL	Underwriter's Laboratories Inc.
UPS	Uninterruptible Power Supply
USE	Upper Shelf Energy
USM	Uniform Support Motion
USMA	Uniform support motion response spectrum analysis
USNRC	United States Nuclear Regulatory Commission
USS	United States Standard
UV	Ultraviolet
V&V	Verification and Validation
Vac / VAC	Volts Alternating Current
Vdc / VDC	Volts Direct Current
VDU	Video Display Unit
VW	Vent Wall
VWO	Valves Wide Open
WD	Wash Down Bays
WH	Warehouse
WS	Water Storage
WT	Water Treatment
WW	Wetwell
XMFR	Transformer
ZPA	Zero period acceleration

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, and Administration Building. Plan and elevation view drawings of the buildings as listed in Table 9A.2-3 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 safety-related 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 shall be 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 shall be capable of being accomplished safely.

This FHA identifies and evaluates the hazard of fires relative to maintaining the safe shutdown capability of the plant. This FHA does not evaluate the overall fire protection program for an ESBWR, since many of an effective program's elements are administrative or procedural in nature, but rather assumes that an ESBWR Owner will have 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 shall be designed to provide reasonable assurance, through defense in depth, that a fire will not prevent the performance of necessary safe shutdown functions and that radioactive releases to the environment in the event of a fire will be minimized.

9A.2 ANALYSIS CRITERIA

9A.2.1 Codes and Standards

The Table 9A.2-1 applicable codes and standards are incorporated into the design of the ESBWR Standard Plant, including the fire detection and suppression systems designs, to the maximum extent practicable. These codes and standards may differ slightly from those listed in 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 NFPA. Tables 1.9-21, 1.9-22, and 1.9-23 identify the relevant edition for each applicable code and standard.

9A.2.2 Fire Area Separation and Fire Equipment Drawings

Drawings showing the fire area separation and fire protection for the Reactor Building, Fuel Building, Control Building, Turbine Building, Radwaste Building, Electrical Building, and Yard are identified in the List of Illustrations.

Drawings showing the fire area separation and fire protection within the Yard buildings (such as within the Pump House, Guard House, Hot Machine Shop, Service Water/Water Treatment Building, Cold Machine Shop, Warehouse, Training Center, Service Building, Auxiliary Boiler Building, and Administration Building) will be added later when detailed arrangements within those buildings are available.

The fire protection water supplies and mains are shown schematically in Figure 9.5-1.

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 3 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 (systems) sprinkler systems or low-pressure carbon dioxide system.

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 no part of which 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 l/8 inch thick which has a flame spread rating not higher than 50 when measured using ASTM E84; or
- 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.

Nuclear 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
- 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 - the ESBWR design utilizes a Class III wet standpipe system as defined by NFPA 14. The Class III wet standpipe system has been modified to provide connections for permanently installed 1.5-inch fire hoses, but also provides 2.5-inch and 1.5-inch hose connections made through one 2.5-inch hose valve and removable 2.5 by 1.5-inch reducer.

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 and the combustible loading limit for all other indoor areas has been conservatively determined as 700 MJ/m^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. The term "doors," where used in the analysis shall mean 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 (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 will normally be 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 UL-listed or 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 3-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 (12,834 Btu/lbm).

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

The analysis uses 48.8 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;

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, its water supply, its suction piping, and its discharge piping throughout the Reactor, Fuel, and Control Buildings are designed to remain functional following an SSE. The standpipes which supply fire water to hose stations covering safety-related 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) 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 55 gallon and all tanks containing chemicals used in water/wastewater treatment or quality control.

In accordance with NFPA 804, 2001 Edition and RG 1.189, April 2001, the following design criteria is used for 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:

(1) The spill of the largest single container of any flammable or combustible liquids in the area.

(2) 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.

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

(4) Where the installation is outside, credible environmental factors such as rain and snow.

(5) Where automatic suppression is not provided throughout, the volume shall be based on a manual fire-fighting flow rate of 500 gal/min (1892.5 L/min) for a duration of 30 minutes, unless the fire hazards analysis demonstrates a different flow rate and duration.

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 and/or depressurization of the reactor pressure vessel;
- Heat removal;

- Heat sink;
- 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 safety-related 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 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 initial 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;
- RB and CB sumps in the Equipment and Floor Drains System;
- RB HVAC System;
- FB HVAC System;
- CB HVAC System;
- Non-IE DCS System;
- Instrument Air System;
- Chilled Water System;
- Seismic category I fire pumps within the Fire Protection System;
- Off-site power supplies (transformers);
- On-site power supplies (diesel-generators and auxiliary equipment);

- 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	Licensing of Production/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 on 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 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	Recommended Practice for Smoke-Control Systems
NFPA 101	Life Safety Code
NFPA 204	Standard for Smoke and Heat Venting
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 780	Standard for the Installation of Lightning Protection Systems
NFPA 804	Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants
NFPA 1961	Standard on 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

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.

ASTM E84	Standard Test Method for Fire Tests of Building Materials
IBC	International Building Code
IFC	International Fire Code
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
IEEE 603	Standard Criteria for Safety Systems for Nuclear Power Generating Stations
Regulatory Guide 1.39	Housekeeping Requirements for Water-Cooled Nuclear Power Plants
Regulatory Guide 1.75	Physical Independence of Electric Systems
Regulatory Guide 1.189	Fire Protection for Operating Nuclear Power Plants
NUREG-0800, Section 9.5.1	Fire Protection Program
NUREG-1552	Fire Barrier Penetration Seals in Nuclear Power Plants

Table 9A.2-2

Systems Required to Achieve Safe Shutdown in the Event of Fire

System	Function	Reactor Condition	Division	Backup System	Tier 2 Ref.	Remarks
ICS A	1/2/3/4	Isolation	I	ICS B ICS C ICS D	5.4.6	Closed loop to and from reactor vessel.
ICS B	1/2/3/4	Isolation	II	ICS A ICS C ICS D	5.4.6	Closed loop to and from reactor vessel.
ICS C	1/2/3/4	Isolation	III	ICS A ICS B ICS D	5.4.6	Closed loop to and from reactor vessel.
ICS D	1/2/3/4	Isolation	IV	ICS A ICS B ICS C	5.4.6	Closed loop to and from reactor vessel.
GDCS A	1	Depressurized	I	GDCS B GDCS C GDCS D	6.3.2	
GDCS B	1	Depressurized	II	GDCS A GDCS C GDCS D	6.3.2	
GDCS C	1	Depressurized	III	GDCS A GDCS B GDCS D	6.3.2	
GDCS D	1	Depressurized	IV	GDCS A GDCS B GDCS C	6.3.2	

Table 9A.2-2

Systems Required to Achieve Safe Shutdown in the Event of Fire

System	Function	Reactor Condition	Division	Backup System	Tier 2 Ref.	Remarks
ADS A	2	Isolated	I	ADS B, C, D ICS B, C, D	6.3.3	
ADS B	2	Isolated	II	ADS A, C, D ICS A, C, D	6.3.3	
ADS C	2	Isolated	III	ADS A, B, D ICS A, B, D	6.3.3	
ADS D	2	Isolated	IV	ADS A, B, C ICS A, B, C	6.3.3	
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	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 I instrument power & signals	5/6/7	All	I	Division II, III, and/or IV	7.2, 7.3	
Div II instrument power & signals	5/6/7	All	II	Division I, III, and/or IV	7.2, 7.3	
Div III instrument power & signals	5/6/7	All	III	Division I, II, and/or IV	7.2, 7.3	
Div IV instrument power & signals	5/6/7	All	IV	Division I, II, and/or III	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

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

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

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

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

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

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

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

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 Section "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 Building Fire Protection Zones ESBWR DCD EL -1400

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

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 Building Fire Protection Zones ESBWR DCD EL 12000

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

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

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

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

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

Figure 9A.2-17. Turbine Building Fire Protection Zones ESBWR DCD EL (Various)

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

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

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

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

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

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

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

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

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

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

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

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

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

Figure 9A.2-27. Electrical Building Fire Protection Zone ESBWR DCD EL 13000

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

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

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

Figure 9A.2-29. Electrical Building Fire Protection Zone ESBWR DCD EL 22000

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

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

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

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

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

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

Figure 9A.2-33. Site Fire Protection Zone 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 will 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, 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. Non safety-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 will also be 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. There are no openings in the steam tunnel that are not 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 GESSAR II SSAR.

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 ICBO 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, and/or air tight. Where possible, these doors are rated and/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 will normally be 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 safety-related buildings. 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 bring the reactor to hot standby and then cold shutdown conditions.

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; 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 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 (PCC), Buffer, 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 Reactor Building.

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 or critical 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 Reactor 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;
- Provisions for curbs around open hatches;
- Use of watertight doors, where required, to protect equipment.

Post-fire recovery for a design basis fire contained to a single Reactor 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 Reactor 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 Reactor Building fire area is considered better than currently operating nuclear plants.

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

- Fire barriers are an integral part of the Reactor Building, designed and installed to withstand a Safe Shutdown Earthquake (SSE);
- Fire suppression system piping in the Reactor Building is designed and installed to withstand an SSE and remain operational;

- Fire detection and alarm in the Reactor 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;
- Protection of the fire protection system in the Reactor Building from design-basis storms, tornados, and floods is provided by the Reactor Building structure itself.

9A.4.2 Fuel Building

As shown on the fire zone drawings (Figures 9A.2-1 through 9A.2-11), 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. The Fuel Building does not contain any safety-related or safe shutdown components, and as such, a fire in the Fuel Building does not affect any of the four divisions used to bring the reactor to hot standby and then cold shutdown conditions.

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;
- 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;
- 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.2-1 through 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 bring the reactor to hot standby and then cold shutdown conditions.

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.

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 in 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 non-safety 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 standpipes in the Control 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;
- 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;
- 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. The Turbine Building does not contain any safety-related or safe shutdown components, and as such, a fire in the Turbine Building does not affect any of the four divisions used to bring the reactor to hot standby and then cold shutdown conditions.

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 EHC 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;
- 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, hydrodynamic, etc, conditions;

- Fire suppression system piping in the Turbine Building is designed and installed to meet NFPA 13 seismic requirements;
- 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 bring the reactor to hot standby and then cold shutdown conditions.

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;
- 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, hydrodynamic, etc, conditions;
- Fire suppression system piping in the Radwaste Building is designed and installed to meet NFPA 13 seismic requirements;
- 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 any safety-related or safe shutdown components, and as such, a fire in the Electrical Building does not affect any of the four divisions used to bring the reactor to hot standby and then cold shutdown conditions.

A fire within any of the fire areas associated with either 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 diesel generators and does not affect the passive safe shutdown components or redundant nonsafety-related 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.

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 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 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;
- 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, hydrodynamic, etc, conditions;
- Fire suppression system piping in the Electrical Building is designed and installed to meet NFPA 13 seismic requirements;
- 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 includes all portions of the plant site external to buildings. Only those portions of the Yard containing equipment associated with Turbine and Electrical Buildings are included at this time; the COL applicant shall include fire zone drawings for those portions of the Yard except for that associated with Turbine and Electrical Building equipment.

This FHA includes a simple evaluation of the Pump House, Guard House, Hot Machine Shop, Service Water/Water Treatment Building, Cold Machine Shop, Warehouse, Training Center, Service Building, Auxiliary Boiler Building, and Administration Building. A more detailed

evaluation of the Service Water/Water Treatment Building and Service Building will be added during the Combined Construction and Operating License (COL) application for a specific site. A more detailed evaluation of the other buildings will be added as needed during detailed design for each building.

As shown on Turbine Building and Electrical Building fire zone drawings (Figures 9A.2-12 and 9A.2-25) as well as Site fire zone drawing (Figure 9A.2-33), the significant outdoor fire hazards shall 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 shall not contain any safety-related or safe shutdown components, and as such, a fire in the Yard shall not affect any of the four divisions used to bring the reactor to hot standby and then cold shutdown conditions.

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

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

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

A preaction sprinkler system shall be 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 shall be 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;
- 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 shall be an integral part of the buildings, designed and installed as required by the IBC for applicable seismic, wind, hydrodynamic, etc, conditions;
- Outdoor fire barriers shall be designed and installed as required by the IBC for applicable seismic, wind, hydrodynamic, etc, conditions;
- Fire suppression system piping in the buildings and in the Yard shall be 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 shall be provided by the building structure itself.
- Outdoor electrical components in the fire protection system shall be weatherproof or protected against moisture intrusion;
- Dry-pipe systems shall be used for all outdoor fire protection piping;
- Outdoor piping, conduit, and components in the fire protection system shall have the required corrosion protection coatings;
- All outdoor fire protection piping and conduit shall be electrically grounded.

9A.4.8 Service Building

The Service Building shall not contain any system or function that could affect the operation or shutdown of the reactor, nor shall 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 shall not affect any of the four divisions used to bring the reactor to hot standby and then cold shutdown conditions. The COL applicant shall design the Service Building fire protection features.

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

The Service Building shall be a completely separate non-seismic structure. It shall have controlled access tunnels to the Reactor Building, the Turbine Building, the Radwaste Building, and the Electrical Building. The exterior wall facing these buildings shall be a 3-hour barrier constructed of fire-resistive concrete. The controlled access doors in this wall shall be rated 3-hour fire resistive, Class A doors. Other exterior walls shall be constructed of concrete, or of gypsum board mounted on metal studs. The stairwells shall be required for personnel access and egress in the event of a fire and shall be 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 shall be 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 shall be designed for Light Hazard Occupancy, 4.2 L/min/m^2 (0.10 gpm/ft^2).

Fire detection shall be provided throughout the Service Building with the use of Class A supervised product-of-combustion detection systems. Alarms, both trouble and fire, shall report

to the Main Control Room. Fire alarms shall be sounded throughout the Service Building. Manual fire alarm pull boxes shall be located at each fire hose and at extinguisher stations.

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

Wall, floor, and ceiling penetrations for piping, HVAC, and cable trays shall be sealed where needed for HVAC control. However, fire dampers or stops shall be 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 shall be 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;
- 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, hydrodynamic, etc, conditions;
- Fire suppression system piping in the Service Building is designed and installed to meet NFPA 13 seismic requirements;
- 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 bring the reactor to hot standby and then cold shutdown conditions. The COL applicant shall design the SF/WT fire protection features. 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 fire-rated. Stairwells shall be 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.

A wet-pipe sprinkler system shall be provided throughout the diesel fire pump room, to provide personnel and property protection, allow egress, and limit the spread of the fire.

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

ABC dry chemical portable fire extinguishers shall be provided on each floor of the facility, located at or near the hose stations and alarm pull boxes. Additional portable fire extinguishers shall be 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 shall be 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;
- Provisions for curbs around open hatches.

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 $5000
- 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 standby condition, and continue to cold shutdown condition if necessary

The first three digits of a four-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 = Other Bldgs

Floor Level within Bldg

Assigned to: 1 = safety-related Div I
2 = safety-related Div II
3 = safety-related Div III
4 = safety-related Div IV
5 = nonsafety redundant A
6 = nonsafety redundant B
9 = nonsafety 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 Reactor Building.

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

9A.5.2 Fuel Building

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

See Figures 9A.2-1 through 9A.2-8 and Figure 9A.2-10 for Fuel Building 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 with the application for COL.

See Figures 9A.2-12, 9A.2-25, and 9A.2-33 for fire drawings for portions of the Yard.

9A.5.8 Service Building

The Service Building is protected in accordance with applicable NFPA codes. A detailed, room-by-room fire protection analysis is not required because this building does not contain any system or function that could affect the safe shutdown of the reactor.

9A.5.9 Service Water/Water Treatment Building

The SF/WT is a site-specific structure and is designed by the COL applicant; the applicant will provide additional information with the application for COL.

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)**
9A.2-6			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1104**	**Class IIIB lubricants Cable insulation Electrical equipment**	**Area-wide ionization**	**Manual pulls (outside Elev at each landing)**	**CO2 fire extinguisher (outside room)**	**Hose racks (in nearby stairwell)**
	1291	**Class IIIB lubricants Cable insulation**			**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)**
9A.2-6			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-11500	**1105**	**Class IIIB lubricants Cable insulation Electrical equipment**	**Area-wide ionization**	**Manual pulls (outside Elev at each landing)**	**CO2 fire extinguisher (outside room)**	**Hose racks (in nearby stairwell)**
	1292	**Class IIIB lubricants Cable insulation**			**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:	**I**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**A**
9A.2-4		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	**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 B**
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** **9A.2-4**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**II**
		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 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		Electrical classification:	**none**
9A.2-2		Safety-related divisional equipment or cables:	**III**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**A**
9A.2-4		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 at each landing)**	**Hose racks (in nearby stairwell)**	**ABC fire extinguishers**
-9100						
-6400						
-1000	**1332**					

< 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 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.

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:	**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:	**IV**
9A.2-3		Nonsafety-related redundant trains or equipment or cables:	**B**
9A.2-4		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:	**Nonsafety 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:	**I**
9A.2-3	**9A.2-8**	Nonsafety-related redundant trains or equipment or cables:	**A**
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	**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**				**ABC fire extinguishers**
-6400	**1250, 1293**	**Cable insulation**				
-1000	**1300, 1304**					
4650	**1400 below floor**	**Cable insulation**				
5050	**1400**	**Cable insulation**			**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
9060	**1500**	**Electrical equipment**				

< 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 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.

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

Fire Area:	**F1152**	Description:	**Nonsafety 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:	**III**
9A.2-3	**9A.2-8**	Nonsafety-related redundant trains or equipment or cables:	**A**
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	**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 1251, 1252**		**Area-wide ionization**			
-1000	**1301, 1306**					
4650	**1401 below floor**	**Cable insulation**				
5050	**1401**	**Cable insulation**			**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
9060	**1501**	**Electrical equipment**				

< 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 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:	**Nonsafety 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:	**IV**
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)**

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**					
4650	**1403 below floor**	**Cable insulation**				
5050	**1403**	**Cable insulation**			**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
9060	**1503**	**Electrical equipment**				

< 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 IV 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:	**Nonsafety 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:	**II**
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**	**Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
	1162	**Cable insulation**				
	1163		**Area-wide photoelectric**			
-6400	**1295**		**Area-wide ionization**			
4650	**1402 below floor**	**Cable insulation**				
5050	**1402**	**Cable insulation**			**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
9060	**1502**	**Electrical equipment**				

< 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 II 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:	**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:	**I, II, III, IV**
9A.2-3	**9A.2-8**	Nonsafety-related redundant trains or equipment or cables:	**A, B**
9A.2-4	**9A.2-9**	Surrounded by fire barriers rated at:	**3 hours**
9A.2-5		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	**1206**					
4650	**14P0**					
9060	**1570**					
17500	**17P0, 17P1, 17P2**	**None**				
27000	**18P3A, 18P3B, 18P4A, 18P4B, 18P4C, 18P5A, 18P5B, 18P5C 18P3C, 18P3D, 18P4D, 18P4E, 18P4F, 18P6A, 18P6B, 18P6C**					

< 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:	**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**

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

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.

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

Fire Area:	**F1190**	Description:	**Stairwells A and E**
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
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:	**F1192**	Description:	**Stairwells C and F**
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/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:	**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 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:	**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 (outside Elev at each landing)**	**Hose racks (in nearby stairwell)**
37000	**1980**	**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 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.2-4		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:	**None, no radiological materials present**
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** **9A.2-3**	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:	**None, no radiological materials present**
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** **9A.2-3**	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:	**None, no radiological materials present**
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** **9A.2-3**	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:	**None, no radiological materials present**
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.2-4**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**II**
		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.2-3**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**I**
		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**	**12,360 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 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.

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:	**F1220**	Description:	**Division II Battery**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-3**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**II**
		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**	**12,360 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 II 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:	**F1230**	Description:	**Division III Battery**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-3**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**III**
		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**	**6840 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 III 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:	**F1240**	Description:	**Division IV Battery**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-2** **9A.2-3**	Building code occupancy classification:	**F-1 per IBC 307.9.11**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**IV**
		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**	**6840 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 IV 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:	**F1262**	Description:	**B Demineralizers**
Building:	**Reactor**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 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:	**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 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.

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**

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

Fire Area:	**F1311**	Description:	**Division I 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:	**I**
9A.2-4	**9A.2-8**	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	**1211**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks at stairwells**
-1000	**1311**	**Electrical equipment**				
	1313	**Cable insulation**				
13570	**1610**					
17500	**1711**					
	1700, 1712	**Cable insulation**			**ABC fire extinguishers**	
	1713	**Class IIIB lubricants**				
	1710	**Electical equipment**			**ABC fire extinguishers, CO2 fire extinguishers**	
		Cable insulation				
		Class IIIB lubricants				

< 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 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.

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 II 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:	**II**
9A.2-4	**9A.2-8**	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**	**Electrical equipment**				
	1323	**Cable insulation**				
13570	**1620**					
17500	**1721**					
	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 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 II 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:	**F1331**	Description:	**Division III 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:	**III**
9A.2-4	**9A.2-8**	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**	**Electrical equipment**				
13570	**1630**	**Cable insulation**				
17500	**1731**					
	1703	**Cable insulation**			**ABC fire extinguishers**	
	1730	**Class IIIB lubricants**				
	1732					

< 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 III 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 IV 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:	**IV**
9A.2-4	**9A.2-8**	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**	**Electrical equipment**				
13570	**1640**	**Cable insulation**				
17500	**1741**					
	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 IV 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:	**Hydrogen Gas 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 I Div II**
		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 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**

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.

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

Fire Area:	**F1460**	Description:	**Hydrogen Gas 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 I Div II**
		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 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**

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.

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

Fire Area:	**F1600**	Description:	**Refueling Floor and Common Access**
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.2-7**	Electrical classification:	**none**
9A.2-5	**9A.2-8**	Safety-related divisional equipment or cables:	**none**
9A.2-6	**9A.2-9**	Nonsafety-related redundant trains or equipment or cables:	**A, B**
		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**	**Transient combustibles**	**Area-wide linear heat**	**Manual pulls (outside stairwell at each landing)**	**Hose racks at stairwells**	**ABC fire extinguishers**
13570	**1600**	**Class IIIB lubricants Electrical equipment Cable insulation**				
17500	**17P3**	**None**				
27000	**18P0,18P1,18P2**					
34000	**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	**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 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:	**F1770**	Description:	**Main Steam Tunnel**
Building:	**Reactor & Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:		Building code occupancy classification:	**F-1**
9A.2-7	**9A.2-13**	Electrical classification:	**none**
9A.2-8	**9A.2-14**	Safety-related divisional equipment or cables:	**I, II, III, IV**
	9A.2-15	Nonsafety-related redundant trains or equipment or cables:	**none**
	9A.2-16	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
8200	**part of 4293** **4393**	**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**
17500	**1770**					

< 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.5-2 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:	none
9A.2-3	9A.2-7	Nonsafety-related redundant trains or equipment or cables:	A, B
9A.2-4	9A.2-8	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, 2160, 2151, 2161, 2102, 2190, 2191					
	21P0, 21P1, 21P2	None	Area-wide linear heat			
-6400	2200, 2201, 2202, 2251, 2261	Class IIIB lubricants Cable insulation	Area-wide ionization			
-1000	2300, 2301, 2302	Electrical equipment				
4650	2400	Class IIIB lubricants Cable insulation	Area-wide linear heat			
	2401	Transient combustibles Class A combustibles	Area-wide ionization			
17500	1702	None				

< 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; 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

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 B equipment; all safety-related and safe shutdown equipment is unaffected by fire and are operable. 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	**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 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 stairwell and hoistway doors**
Property loss:	**Negligible**

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	**9A.2-8**	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						
4650						
9060						
22500						

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.5-2 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**
9A.2-8		Except:	**basemat**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650 **22500**	**2490**	**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 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.2-8**	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.2-8**	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**
22500	**2601**	**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:	**9A.2-2** **9A.2-3** **9A.2-4** **9A.2-5**	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	**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**					
	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** **9A.2-5**	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**			

< 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 I 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:	**I**
	9A.2-4	Nonsafety-related redundant trains or equipment or cables:	**A**
	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**
	3110 below floor		**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwells)**
-6800	**3250**					
	3110	**Cable insulation Electrical equipment**				
	3251	**None**			**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
9060	**3401 3404 3406**	**Class IIIB lubricants Cable insulation Filter media**				
	Charcoal Filter	**Charcoal**	**HVAC temperature indication**		**Internal manual spray**	

< 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 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**

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 I 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 II 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:	**II**
		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**
	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 II 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 III 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:	**III**
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	**3260**					
	3130	**Cable insulation Electrical equipment**				
	3261	**Insulation**			**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
9060	**3402 3403 3407**	**Class IIIB lubricants Cable insulation Filter media**				
	Charcoal Filter	**Charcoal**	**HVAC temperature indication**		**Internal manual spray**	

< 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 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**

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 III 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.

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

Fire Area:	**F3140**	Description:	**Division VI Electrical**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 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:	**IV**
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	**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**				
4650	**3301 below floor**	**Cable insulation**				
5250	**3301**	**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 IV 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:	**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:	**9A.2-2** **9A.2-3** **9A.2-4** **9A.2-5**	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	**3191**	**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	**3405**	**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 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 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:	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.2-4	Building code occupancy classification:	B
		Electrical classification:	none
		Safety-related divisional equipment or cables:	I, II, III, IV
		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				
	3270 3271 3273 3274 3204, 3205	Electrical equipment Class A combustibles Filter media Class IIIA lubricants			Hose racks (in nearby stairwells)	ABC fire extinguishers
	3201, 3202	Class A combustibles	Area-wide photoelectric			
	above ceiling	Insulation	Area-wide ionization			

< 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:	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

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 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 Remote Shutdown Panel (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:	**F3302**	Description:	**Non-1E Electrical**
Building:	**Control**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 75, 101, 804**
DCD Fig:	**9A.2-4** **9A.2-5**	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
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 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**
Property loss:	**Significant**

Table 9A5-4 Turbine Building

Fire Area:	**F4100**	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:		Building code occupancy classification:	**F-1**
	9A.2-12	Electrical classification:	**none**
	9A.2-13	Safety-related divisional equipment or cables:	**I, II, III, IV**
	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); exterior underground walls (non-rated); exterior walls above EL 12000 (non-rated)**
	9A.2-17		

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4180, 4181, 4182**	**Class IIIB lubricants Cable insulation**	**Area-wide photoelectric Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**ABC fire extinguishers**	**Hose racks (in nearby stairwells)**
	41F1A,41F1B,41F1C, 41F1D,41F1E,41F1F, 41F1G, 41F0, 41F3, 41F4, 41F5, 41F6, 41F7, 41F8, 41F9					
	4100, 4101, 4102 4105, 4107, 4199	**Class IIIB lubricants Cable insulation Filter media**				
	4106, 4184 4185, 4186	**Class IIIB lubricants Cable insulation**	**Suppression flowswitch**		**Wet-pipe sprinkler 16.3 L/min per m2 over most remote 465 m2**	
4650	**4205, 4206, 4207 4202, 4203**					
	4281, 4282,	**< 28 m3 Hydrogen Class IIIB lubricants**	**Area-wide spot heat**		**ABC fire extinguishers**	
	4201, 4204, 4280, 4284, 4290, 4291, 42F1A,42F1B,42F1C, 42F1D,42F1E,42F1F, 42F1G, 42F1H, 4283, 42F2A,42F2B,42F2C, 42F2D,42F2E,42F2F, 42F2G, 42F2H, 42F4, 4295	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**			

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4100 (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		Electrical classification:	**none**
9A.2-13		Safety-related divisional equipment or cables:	**I, II, III, IV**
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); exterior underground walls (non-rated); exterior walls above EL 12000 (non-rated)**
9A.2-17			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**4200, 4294**	**Electrical equipment Cable insulation Class IIIB lubricants Transient combustibles**	**Suppression flowswitch**	**Manual pulls (outside stairwell at each landing)**	**Dry-pipe sprinkler 8.1 L/min per m2 over most remote 181 m2**	**Hose racks (in nearby stairwells)**
7650	**42F0**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**		**ABC fire extinguishers**	
8200	**4293**					
	4293 (end of tunnel)		**Suppression flowswitch**		**Dry-pilot deluge 37.2 L/min per meter (water curtain)**	
12000	**4300, 4301, 4302, 4303, 4304, 4305, 4306, 4309, 4383, 4387, 4394**	**Class IIIB lubricants Cable insulation Filter media**	**Area-wide ionization**		**ABC fire extinguishers**	
	4380, 4381, 4382	**Cable insulation Class IIIB lubricants**	**Suppression flowswitch**		**Wet-pipe sprinkler 16.3 L/min per m2 over most remote 465 m2**	
16000	**4391, 4392**					
23500						
20000	**4390 4405 curbed area**					
	rest of 4405 4400, 4401, 4402 4403, 4404	**Class IIIB lubricants Cable insulation Filter media**	**Area-wide ionization**		**ABC fire extinguishers**	

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4100 (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		Electrical classification:	**none**
9A.2-13		Safety-related divisional equipment or cables:	**I, II, III, IV**
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); exterior underground walls (non-rated); exterior walls above EL 12000 (non-rated)**
9A.2-17			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
20000	**H2 seal oil unit**	**Class IIIB lubricants < 11,000 L Class IIIA seal oil**	**Suppression flowswitch**	**Manual pulls (outside stairwells at each landing)**	**Dry-pilot deluge 12.2 L/min per m2**	**Hose racks (in nearby stairwells)**
28000	**4580 above ceiling**	**Cable insulation**	**Area-wide ionization**		**ABC fire extinguishers**	
	4500, 4501, 4502 4503, 4504, 4580 4581, 4582, 4583	**Class IIIB lubricants Cable insulation Filter media**				
	4505, 4508, 4509		**Area-wide linear heat**			
	4506, 4507		**Area-wide spot heat**			
	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**			
33000	**4600, 4602**	**Class IIIB lubricants Cable insulation Filter media**	**Area-wide ionization**		**ABC fire extinguishers**	**Hose racks (in nearby stairwells)**
43500	**4505**					
54000						

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4100 (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		Electrical classification:	**none**
9A.2-13		Safety-related divisional equipment or cables:	**I, II, III, IV**
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); exterior underground walls (non-rated); exterior walls above EL 12000 (non-rated)**
9A.2-17			

> 700 in rooms where turbine oil can flow	
< 700 in all other rooms	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:	**Contained within building**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
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. Fire-related failure of safety-related instrumentaion may cause reactor scram or containment isolation. See Sections 9A.6.4.2, 9A.6.4.3, 9A.6.4.5 and 9A.6.4.13.

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4103**	Description:	**Feedwater Pumps**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 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.2-14		Nonsafety-related redundant trains or equipment or cables:	**A, B**
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	**4183**	**Class IIIB lubricants Cable insulation**	**Area-wide photoelectric**	**Area-wide spot heat**	**Preaction sprinkler 12.2 L/min per m2 over most remote 302 m2**	**Hose racks (in nearby stairwells)**
	4104	**Class IIIB lubricants Cable insulation < 28 m3 Hydrogen**	**Dry-pilot detection**			
	4103	**Class IIIB lubricants Cable insulation Filter media**	**Area-wide ionization**			
	4292	**None**	**Area-wide ionization**			

> 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 up to all four redundant FW pumps, but 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 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 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4108**	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.2-14		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-15		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	**Adsorber** **Adsorber A** **Adsorber B** **Adsorber C** **Adsorber D** **Adsorber E** **Adsorber F** **Adsorber G** **Adsorber H**	**Charcoal**	**Process indication**	**Manual pulls (outside Elev at each landing)**	**Internal manual spray in each adsorber vessel**	**Hose racks (in nearby stairwell)**
	4108	**Class IIIB lubricants** **Cable insulation**	**Area-wide ionization**		**ABC fire extinguishers (outside Elev at each landing)**	
12000	**4386**					

< 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:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and interior doors**
Property loss:	**Moderate**

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4190**	Description:	**Elevator A**
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		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); elevator doors (1.5 hr rated)**
9A.2-17			

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**	**Manual pulls (outside Elev at each landing)**	**ABC fire extinguishers (outside Elev at each landing)**	**Hose racks (in nearby stairwell)**
36000	**4680**	**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 9A5-4 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		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)**
9A.2-17			

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 landing)**	**Hose racks**	**ABC fire extinguishers**
4650						
12000						
20000						
28000						
33000						
36000						

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 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4192**	Description:	**Elevator B**
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		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); elevator doors (1.5 hr rated)**
9A.2-17			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4192**	**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)**
57000	**4681**	**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 9A5-4 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		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)**
9A.2-17			

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 landing)**	**Hose racks**	**ABC fire extinguishers**
4650						
12000						
20000						
28000						
33000						
43500						
54000						
57000						

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 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4194**	Description:	**Elevator C**
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		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); elevator doors (1.5 hr rated)**
9A.2-17			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4194**	**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)**
31000	**4682**	**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 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4195**	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		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)**
9A.2-17			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4195**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
8200						
12000						
20000						
28000						
31000						

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 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4196**	Description:	**Elevator D**
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		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); elevator doors (1.5 hr rated)**
9A.2-17			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4196**	**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)**
31000	**4683**	**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 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4197**	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		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)**
9A.2-17			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-1400	**4197**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
4650						
12000						
20000						
28000						
31000						

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 9A5-4 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.2-14**	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
4650	**4250**	**Electrical equipment** **Cable insulation** **Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwells at each landing)**	**Hose racks (in nearby stairwells)**	**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 safety division 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:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A5-4 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** **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
4650	**4260**	**Electrical equipment** **Cable insulation** **Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls (outside stairwells at each landing)**	**Hose racks (in nearby stairwells)**	**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 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:	**Moderate**

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4307**	Description:	**Turbine EHC**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 15, 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:	**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
12000	**4307**	**<3,500 L Class IIIA hydraulic oil Cable insulation Class IIIB lubricants**	**Suppression flowswitch**	**Manual pulls (outside stairwells at each landing)**	**Dry-pilot deluge 12.2 L/min per m2**	**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 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; 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**

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4308**	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.2-14** **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
12000	**4308**	**< 50,000 L Class IIIB lubricants** **Cable insulation**	**Suppression flowswitch**	**Manual pulls (outside stairwells at each landing)**	**Dry-pilot foam-water deluge 16.3 L/min per m2**	**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 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; 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**

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4350**	Description:	**Instrument Air 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	**4350**	**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 A equipment and no safety-related or safe shutdown divisional equipment; all safety division 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:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4360**	Description:	**Instrument Air 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	**4360**	**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 9A5-4 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.2-17**	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 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 A equipment and no safety-related or safe shutdown divisional equipment; all safety division 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:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Moderate**

Table 9A5-4 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** **9A.2-17**	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 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:	**Moderate**

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4651**	Description:	**Water Surge Tanks A**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-17**	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
33000	**4651**	**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 A equipment and no safety-related or safe shutdown divisional equipment; all safety division 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:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells**
Property loss:	**Minor**

Table 9A5-4 Turbine Building (Cont.)

Fire Area:	**F4661**	Description:	**Water Surge Tanks B**
Building:	**Turbine**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-17**	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
33000	**4661**	**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.5-5 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**	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	**6200, 6201, 6280, 6281, 6282, 6283, 6284, 6285, 6286**					
4650	**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 per 10 CFR 100 limits**
Life safety:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via stairwells and exterionr doors**
Property loss:	**Moderate**

Table 9A.5-5 Radwaste Building (cont.)

Fire Area:	**F6170**	Description:	**Electrical Equipment**
Building:	**Radwaste**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-20** **9A.2-21**	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)**
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	**6192**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-2350						
4650						
10650						

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:		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	**6193**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-2350						
4650						
10650						

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:		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	**6194**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
-2350						
4650						
10650						

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** **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
-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 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**

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.5-6 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.2-27		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**
9A.2-30			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5292B**	**Insulation**	**Area-wide ionization**	**Manual pulls (at EXITs)**	**Hose racks (in nearby stairwells)**	**ABC fire extinguishers**
	5100, 5101, 5102, 5189	**Cable insulation**				
9080	**5200**					
13000	**5300**					
	5391					
18000	**5400**					
22000	**5500**					
27000	**5600**					
30000	**5703**					

< 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 doors**
Property loss:	**Negligible**

Table 9A.5-6 Electrical Building (Cont.)

Fire Area:	**F5150**	Description:	**Batteries 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 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	**5150**	**3420 L of battery acid** **Battery cell cases** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**
	5151	**11,040 L of battery acid** **Battery cell cases** **Cable insulation**				
	5152	**13,680 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 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:	**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:	**F5154**	Description:	**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** **9A.2-27**	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	**5154**	**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**

> 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 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:	**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:	**F5255**	Description:	**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.2-27**	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
8000	**5255**	**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**

> 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 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:	**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:	**F5156**	Description:	**D-G Electrical Equipment A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 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	**5156**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pulls (at EXITs)**	**CO2 fire extinguishers**	**Hydrants**

< 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 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:	**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:	**F5160**	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.2-26**	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:	**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	**5160**	**3420 L of battery acid** **Battery cell cases** **Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**
	5161	**11,040 L of battery acid** **Battery cell cases** **Cable insulation**				
	5162	**13,680 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 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:	**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:	**F5164**	Description:	**Diesel Generator B**
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** **9A.2-27**	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	**5164**	**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**

> 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 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:	**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:	**F5265**	Description:	**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.2-27**	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
8000	**5265**	**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**

> 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 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:	**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:	**F5166**	Description:	**D-G Electrical Equipment B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 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:	**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	**5166**	**Electrical equipment** **Cable insulation**	**Area-wide ionization**	**Manual pulls (at EXITs)**	**CO2 fire extinguishers**	**Hydrants**

< 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 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:	**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:	**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:		Building code occupancy classification:	**B**
9A.2-25		Electrical classification:	**none**
9A.2-26		Safety-related divisional equipment or cables:	**none**
9A.2-27		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**basemat (non-rated)**
9A.2-30			
9A.2-31			

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, 5183, 5184, 5185, 5186A, 5186B, 5186C, 5187**	**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 (in nearby stairwells)**
	above ceiling 5292A	**Insulation**	**Area-wide ionization**		**Class 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:	**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:	**F5188**	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** **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:	**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	**5188**	**Cable insulation** **Class IIIB lubricants**	**Area-wide ionization**	**Manual pulls** **(at EXITs)**	**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 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.5-6 Electrical Building (Cont.)

Fire Area:	**F5190**	Description:	**Elevator A**
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.2-27		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**
9A.2-30			
9A.2-31			

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 Elev at each landing)**	**ABC fire extinguishers (outside Elev at each landing)**	**Hose racks (in nearby stairwell)**
30000	**5701**	**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.5-6 Electrical Building (Cont.)

Fire Area:	**F5191**	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.2-27		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**
9A.2-30			
9A.2-31			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5191**	**None**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks**	**ABC fire extinguishers**
9800						
13000						
18000						
22000						
27000						
30000						

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.5-6 Electrical Building (Cont.)

Fire Area:	**F5192**	Description:	**Elevator B**
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.2-27		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**basemat (non-rated); elevator doors (1.5 hr rated)**
9A.2-30			
9A.2-31			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5192**	**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)**
30000	**5703**	**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.5-6 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.2-27		Nonsafety-related redundant trains or equipment or cables:	**none**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**basemat (non-rated)**
9A.2-30			
9A.2-31			

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 landing)**	**Hose racks**	**ABC fire extinguishers**
9800						
13000						
18000						
22000						
27000						
30000						

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.5-6 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.2-26**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**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 **1300** **4650**	**5194**	**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.5-6 Electrical Building (Cont.)

Fire Area:	**F5250**	Description:	**Lower Cable Spreading A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-26** **9A.2-27**	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	**5250**	**Cable insulation**	**Suppression flowswitch**	**Manual pulls (at EXITs)**	**Wet-pipe sprinkler 12.2 L/min per m2 over most remote 235 m2**	**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 only redundant train A on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train B on-site and off-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:	**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:	**F5260**	Description:	**Lower Cable Spreading B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-26** **9A.2-27**	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 **9800**	**5163** **5260**	**Cable insulation**	**Suppression flowswitch**	**Manual pulls (at EXITs)**	**Wet-pipe sprinkler 12.2 L/min per m2 over most remote 235 m2**	**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 only redundant train B on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train A on-site and off-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:	**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:	**F5301**	Description:	**Battery C**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-27** **9A.2-28**	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
13000	**5301**	**5520 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 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 doors**
Property loss:	**Moderate**

Table 9A.5-6 Electrical Building (Cont.)

Fire Area:	**F5302**	Description:	**Electrical Equipment C**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-27** **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:	**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
13000	**5302**	**Electrical equipment** **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 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 doors**
Property loss:	**Moderate**

Table 9A.5-6 Electrical Building (Cont.)

Fire Area:	**F5303**	Description:	**Electronic Equipment**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-27** **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:	**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
13000	**5303 below floor**	**Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell)**	**CO2 fire extinguishers**	**Hose racks (in nearby stairwell)**
13400	**5303**	**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 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 doors**
Property loss:	**Moderate**

Table 9A.5-6 Electrical Building (Cont.)

Fire Area:	**F5350**	Description:	**Lower Electrical Equipment A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-27** **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
13000	**5350**	**Electrical equipment** **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 affects only redundant train A on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train B on-site and off-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:	**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:	**F5360**	Description:	**Lower Electrical Equipment B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-27** **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:	**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
13000	**5360**	**Electrical equipment** **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 affects only redundant train B on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train A on-site and off-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:	**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:	**Upper Cable Spreading A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-28** **9A.2-29**	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 **18000**	**5153** **5450**	**Cable insulation**	**Suppression flowswitch**	**Manual pulls (at EXITs)**	**Wet-pipe sprinkler 12.2 L/min per m2 over most remote 235 m2**	**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 only redundant train A on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train B on-site and off-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:	**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:	**F5460**	Description:	**Upper Cable Spreading B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 14, 72, 101, 804**
DCD Fig:	**9A.2-28** **9A.2-29**	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	**5460**	**Cable insulation**	**Suppression flowswitch**	**Manual pulls (at EXITs)**	**Wet-pipe sprinkler 12.2 L/min per m2 over most remote 235 m2**	**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 only redundant train B on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train A on-site and off-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:	**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:	**F5550**	Description:	**Upper Electrical Equipment A**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-29** **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
22000	**5550**	**Electrical equipment** **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 affects only redundant train A on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train B on-site and off-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:	**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:	**F5560**	Description:	**Upper Electrical Equipment B**
Building:	**Electrical**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 14, 72, 101, 804**
DCD Fig:	**9A.2-29** **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:	**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
22000	**5560**	**Electrical equipment** **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 affects only redundant train B on-site and off-site power and related equipment and no safety-related equipment; all safety divisions and redundant train A on-site and off-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:	**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:	**F5650**	Description:	**HVAC Equipment A**
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.2-27		Nonsafety-related redundant trains or equipment or cables:	**A**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**none**
9A.2-30			
9A.2-31			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5290A, 5291A**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks (at stairwells)**	**ABC fire extinguishers**
27000	**5650, 5651, 5652, 5653**	**Filter media Insulation**				
	Charcoal Filter in 5653	**Charcoal**	**HVAC temperature indication**		**Internal manual spray**	**Hose racks (at 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 results in loss of only redundant train A equipment; all safety divisions and redundant train B 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 inteior doors**
Property loss:	**Moderate**

Table 9A.5-6 Electrical Building (Cont.)

Fire Area:	**F5660**	Description:	**HVAC 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.2-27		Nonsafety-related redundant trains or equipment or cables:	**B**
9A.2-28		Surrounded by fire barriers rated at:	**3 hours**
9A.2-29		Except:	**none**
9A.2-30			
9A.2-31			

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**5290B, 5291B**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls (outside stairwell at each landing)**	**Hose racks (at stairwells)**	**ABC fire extinguishers**
27000	**5660, 5661, 5662, 5663**	**Filter media Insulation**				
	Charcoal Filter	**Charcoal**	**HVAC temperature indication**		**Internal manual spray**	**Hose racks (at 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 results in loss of only redundant train B equipment; all safety divisions and redundant train A 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 inteior 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 LO 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 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 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**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F4251**	Description:	**A Feedpump ASD Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 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	**ASD A Transformer**	**< 4000 L Class IIIA insulating mineral oil (~15 MVA)**	**Transformer instrumentation**	**None**	**Hydrants**	**CO2 fire extinguishers**

< 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 (turbine operates at 100% w/ 3 FW pumps)**
Radiological release:	**None, no radiological materials present**
Life Safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Moderate**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F4252**	Description:	**C Feedpump ASD Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 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	**ASD C Transformer**	**< 4000 L Class IIIA insulating mineral oil (~15 MVA)**	**Transformer instrumentation**	**None**	**Hydrants**	**CO2 fire extinguishers**

< 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 (turbine operates at 100% w/ 3 FW pumps)**
Radiological release:	**None, no radiological materials present**
Life Safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Moderate**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F4261**	Description:	**B Feedpump ASD Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 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	**ASD B Transformer**	**< 4000 L Class IIIA insulating mineral oil (~15 MVA)**	**Transformer instrumentation**	**None**	**Hydrants**	**CO2 fire extinguishers**

< 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 (turbine operates at 100% w/ 3 FW pumps)**
Radiological release:	**None, no radiological materials present**
Life Safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Moderate**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F4262**	Description:	**D Feedpump ASD Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 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	**ASD D Transformer**	**< 4000 L Class IIIA insulating mineral oil (~15 MVA)**	**Transformer instrumentation**	**None**	**Hydrants**	**CO2 fire extinguishers**

< 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 (turbine operates at 100% w/ 3 FW pumps)**
Radiological release:	**None, no radiological materials present**
Life Safety:	**N/A**
Manual firefighting:	**Access via open north side**
Property loss:	**Moderate**

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** **9A.2-14**	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 MT w/ ST**
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** **9A.2-14**	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 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:	**F4273**	Description:	**Phase C Main Transformer**
Building:	**Yard**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 15, 24, 804**
DCD Fig:	**9A.2-13** **9A.2-14**	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 10, 24, 804**
DCD Fig:	**9A.2-13** **9A.2-14**	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**	**none (transformer maintained dry) (~625 MVA)**	**None**	**None**	**Hydrants**	**ABC fire extinguishers**

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** **9A.2-26** **9A.2-27**	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** **9A.2-26** **9A.2-27**	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**	**~756,000L 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 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, 72, 804**
DCD Fig:	**9A.2-25** **9A.2-26** **9A.2-27**	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, 72, 804**
DCD Fig:	**9A.2-25** **9A.2-26** **9A.2-27**	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**	**~756,000L 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:	**F7150**	Description:	**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**
		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:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**7150**	**< 2500 L Class II fuel Class IIIB lubricants Cable insulation**	**Suppression flowswitch**	**Manual pull**	**Wet-pipe sprinkler 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 nonseismic diesel-driven fire pump; remaining two (motor-driven and diesel-driven) Seismic Category I fire pumps are unaffected by fire and are 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:	**Travel distance limits to EXITs meet NFPA 101**
Manual firefighting:	**Access via exterior door**
Property loss:	**Minor**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F7180**	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	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:	**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	Assuming automatic & manual FP equipment does not function, impact of design basis fire on safe shutdown:
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**

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:	**F8110**	Description:	**Breathing Air Storage Division I**
Building:	**EBAS Structure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 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:	**I**
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), exterior walls (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**8110**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls**	**Hydrants**	**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 Division I emergency breathing air; Division II and III of breathing air and trains A and B 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:	**Limited access via hatch**
Property loss:	**Moderate**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F8120**	Description:	**Breathing Air Storage Division II**
Building:	**EBAS Structure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 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:	**II**
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), exterior walls (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**8120**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls**	**Hydrants**	**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 Division II emergency breathing air; Division I and III of breathing air and trains A and B 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:	**Limited access via hatch**
Property loss:	**Minor**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F8130**	Description:	**Breathing Air Storage Division III**
Building:	**EBAS Structure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 24, 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:	**III**
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), exterior walls (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
-7400	**8130**	**Class IIIB lubricants Cable insulation**	**Area-wide ionization**	**Manual pulls**	**Hydrants**	**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 Division III emergency breathing air; Division I and II of breathing air and trains A and B 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:	**Limited access via hatch**
Property loss:	**Minor**

Table 9A.5-7 Yard (Cont.)

Fire Area:	**F8250**	Description:	**Electric Firepump A**
Building:	**Fire Pump Enclosure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 20, 24, 72, 101, 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 (fire wall common with F8260)**
		Except:	**exterior walls (non-rated), roof (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**8250**	**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 results in loss of only the motor-driven fire pump; remaining two diesel-driven fire pumps (Seismic Category I and nonseismic) 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:	**F8260**	Description:	**Diesel Fire Pump B**
Building:	**Fire Pump Enclosure**	Applicable codes:	**IBC; Reg Guide 1.189; NFPA 10, 13, 20, 24, 30, 37, 72, 101, 804**
DCD Fig:	**9A.2-4**	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 (fire wall common with F8250)**
		Except:	**exterior walls (non-rated), roof (non-rated)**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
4650	**8260**	**< 2500 L Class II fuel Class IIIB lubricants Cable insulation**	**Suppression flowswitch**	**Manual pull**	**Wet-pipe sprinkler 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 Seismic Category I diesel-driven fire pump; remaining two (motor-driven and nonseismic diesel-driven) fire pumps 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:	**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.2-25**	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
-2000	**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.2-25**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**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	**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** **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:	**none**

Consisting of the following Rooms:			Fire Detection		Fire Suppression	
EL	Room #	Potential Combustibles	Primary	Backup	Primary	Backup
1300	**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 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.

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:	**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.2-13**	Building code occupancy classification:	**F-1**
		Electrical classification:	**none**
		Safety-related divisional equipment or cables:	**none**
		Nonsafety-related redundant trains or equipment or cables:	**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
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**

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. It is a COL license requirement to provide a detailed design with equivalent construction to tested wall assemblies when penetrating rated fire barriers or testing will be required. Refer to Subsection 9A.7.6 for COL information.

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 fire water 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 will 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 I or II) from 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 air header dump valves act as a diverse backup to the scram logic and are safety-related. Separate divisions of 240 VDC power energize the two air header dump 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 steam line (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 Class 1E 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 and causes MSIV closure before the fire burns out the equipment. No fire will propagate along the fire-retardant cabling to the control room and cause damage to the 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 Steam Line Tunnel Area Ambient Temperature temperature element located in the MSL Tunnel
- Main Steam Line Tunnel Area Ambient Temperature temperature element located in the Turbine Building

Backup trips for MSIV isolation, either direct 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 per 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 will occur or propagate as a result of these possible failures.

In summary, failure of the MSIV sensors in the Turbine Building and their cables in any fashion 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 steam lines 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 will provide 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 will 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 II power actuates Solenoid 2 and Division I power actuates Solenoid 3. Solenoid 1 is the test solenoid and is powered by Division I (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. Failure of the MSIV or its control and interlocking circuits that could be caused by a postulated fire outside the containment cannot prevent closure of 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 Motor 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 hardwired 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 (i.e., synchro cables, FMCRD brake and motor cables, reed switch rod position status cables) are contained in flexible metallic conduit under the vessel, arranged in the pull boxes mounted just above the CRD restraint structure. All of these RC&IS cables are classified as non-safety.

FMCRD Separation Switch Cables

The FMCRD cables for the Class 1E separation switches of each FMCRD 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 essential 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 essential 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 essential multiplex system power supplies. This provides natural circuit protection in event of shorts or grounds on the system. Such events do not jeopardize the integrity or independence of the higher voltage divisional power busses 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 I and III cables are routed under vessel to the 0° to 180° half of the core, whereas Division II and IV cables are routed under 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 the Division I LPRM cables into the 0° to 90° quadrant of the lower drywell; Division II into the 180° to 270° quadrant; Division III into 90° to 180° quadrant; and Division IV 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 classed 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 therefore a fire is not possible. 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.

Administrative procedures to control combustible materials are provided. These procedures prohibit combustibles from being stored in areas with divisional cable or 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. Multidivisional 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 to isolate redundant sets of 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 and/or grounding of these cables due to postulated fire does not jeopardize the emergency power busses 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 will not damage equipment in the other division. The SLC equipment is all 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 spurious operation or failure of the squib injection valves and no other divisional equipment would be affected. Spurious operation or failure of 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 close to isolate containment when isolation is required. In general, outboard isolation valves are assigned to Division I and inboard isolation valves to Division II. In some cases this results in Division I outboard isolation valves being located in Division II areas. This is acceptable from a functional standpoint because a fire in an area outside of containment and involving the penetration 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 Remote Shutdown System (RSS) panel, located in separate fire areas within the Reactor Building.

9A.6.4.13 Safety-Related Instrumentation in Turbine Buildings

Safety-related devices within the Turbine 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 safety-related RPS output devices listed in the table receive a signal from the RPS to initiate an anticipatory trip of the Feedwater Pumps. The devices listed in the Table 9A.6-1 are provided for DCD Tier 2, Chapter 15, Analysis of Anticipated Operating Occurrences, and DCD Tier 2, Chapter 15, Analysis of Infrequent Events, and do not perform a safe-shutdown function in the event of a fire.

The cables associated with these devices will be routed in individual raceway specific to their associated division, and will be 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 within their fire area 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 will exhaust 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 will 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 will not affect electrical cabinets or consoles from multiple divisions. The Main Control Room Complex is

continuously manned so that any fire will be 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 I or II Remote Shutdown System (RSS) panels (located remotely from Main Control Room, in the Reactor Building) enable the operators to bring the reactor to a safe shutdown.

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 or 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 will be 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 fire water will not affect the ability to safely shutdown the reactor. If the fire water is assumed to transport immediately to the basement of the Control Building, the resulting accumulation of water will not affect safety-related equipment located in the basement. In either case, the fire fighting activities will not prevent the reactor from being safely shutdown.

Finally, in the unlikely event that a fire in the Main Control Room were to require evacuation, use of either the Division I or II Remote Shutdown System (RSS) panel (located remotely from Main Control Room, in the Reactor Building) enable the operators to bring the reactor to a safe shutdown.

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 or 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 be self-extinguishing or very slow to spread. No transient combustibles stored in the subfloor volume during normal activities to 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 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 will 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 I or II Remote Shutdown System (RSS) panel (located remotely from Main Control Room, in the Reactor Building) enable the operators to bring the reactor to a safe shutdown

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 diesel generators, the capacity of each of the diesel day tanks will likely exceed 4164 L (1100 gallons) to allow enough fuel for at least 8 hours of diesel operation at the maximum load demand and is expected to exceed BTP recommended limits.

Justification: The ESBWR design includes two independent and physically separated nonsafety-related diesel generators, either of which is capable of providing the full electrical load for the redundant nonsafety-related electrical buses. Neither diesel generators 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 of masonry or concrete construction. 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 Diesel Generator (DG) rooms and are positioned such that the 3-hour fire rated walls, ceiling, and floor of the day tank room 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 with 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 will be extinguished. In the unlikely event the fire cannot be extinguished, the day tank 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.

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 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 opening to these rooms are the exterior equipment doors which could be opened if fire fighting activities necessitate so that any overflow would spill outside the building and not spread to other parts of the electrical building. Therefore, any overflow from the sump area of the room will not affect any other equipment, nor will it affect safe shutdown equipment or equipment needed for support of safe shutdown equipment.

9A.6.5.5 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 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 diesel generator rooms are designed to prevent inadvertent actuation by utilizing preaction automatic sprinkler type. The sprinkler piping and closed head sprinklers are pneumatically supervised for leakage, and any inadvertent actuation of the deluge valve during testing or maintenance will 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 will annunciate 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 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 diesel generators, either of which is capable of providing the full electrical load for the redundant nonsafety-related electrical buses. Neither diesel generators is 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.6.5.6 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 or 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 will be 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 fire water will not affect the ability to safely shutdown the reactor. If the fire water is assumed to transport immediately to the basement of the building, the resulting accumulation of water will not affect safety-related equipment located in the basement. In either case, the fire fighting activities will not prevent the reactor from being safely shutdown.

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 will 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 I or II Remote Shutdown System (RSS) panel (located remotely from Main Control Room, in the Reactor Building) enable the operators to bring the reactor to a safe shutdown.

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. The COL licensee shall obtain approval from the appropriate authority having jurisdiction prior to construction for the "alternative method" of fire protection for unsprinklered buildings, which are discussed in the following subsections. Refer to Subsections 9A.7.7-9A.7.11 for COL information.

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 proposed 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) 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) 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.

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. The unsprinklered Reactor Building contains fire area F1600 which exceeds 1115 m^2; the unsprinklered Fuel Building contains fire area F2100 which exceeds 1115 m^2; and the partially sprinklered Turbine Building contains fire area F4100 which exceeds 1115 m^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. 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.

In compliance with NFPA 804 and Regulatory Guide 1.189, no sprinkler protection is proposed throughout 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) 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) within the unsprinklered portion of the Turbine Building fire area F4100;
- As shown in Table 9A.5-4, automatic fire suppression throughout Turbine Building rooms that contain significant fire hazards (>700 MJ/m^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, F2100, and F4100 would be ineffective against a floor level fire; the extreme height would likely prevent sufficient heat from reaching sprinkler heads to actuate them;
- Subdividing fire areas F1600, F2100, and F4100 into fire areas less than 1115 m^2 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 proposed 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) 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) 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); 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;
- 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 proposed throughout 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) 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) 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;
- Adding enough exterior openings to comply with Section 903.2.10 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	I, II, III, IV	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	I, II, III, IV	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	I, II, III, IV	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	I, II, III, IV	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
Turbine Control Valve Position	Input	Transmitter (Analog signal between upper and lower limits)	TB	4506 and 4507	I, II, III, IV	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

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 Area Temperatures (Main Steam Leak Detection)	Input	Temperature Elements (Analog signal between upper and lower limits)	TB	4390 and 4393	I, II, III, IV	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
Safety-Related Feedwater Pump Breaker Trip	Output	Breaker Trip Coils	TB	4102	I, II	Loss of RPS Ability to Trip Feedwater Pumps	Trip of all Feedwater Pump Breakers Resulting in Loss of Feedwater Flow; Refer to Subsection 15.2.5.3
Safety Related Feedwater Pump Breaker DC Control Power	N/A	Breaker Trip Coils	TB	4102	I, II	Loss of RPS Ability to Trip Feedwater Pumps	Loss of RPS Ability to Trip Feedwater Pumps
Feedwater Line Diff. Pressure (Indication of Feedwater Pump Runout)	Input	Transmitter (Analog signal between upper and lower limits)	TB	4293	I, II, III, IV	Indication to RPS of Feedwater Pump Runout; Refer to Subsection 15.2.4.2	Indication to RPS of Feedwater Pump Runout; Refer to Subsection 15.2.4.2

9A.7 COL INFORMATION

9A.7.1 The COL applicant shall establish fire hazard design acceptance criteria for the Service Water/Water Treatment Building and Service Building (Refer to 9A.1).

9A.7.2 The COL applicant shall include drawings showing the fire area separation and fire protection features for the Yard buildings, Service Water/Water Treatment Building, and Service Building (Refer to 9A.2.2).

9A.7.3 The COL applicant shall include fire zone drawings for those portions of the Yard except for that associated with Turbine and Electrical Building equipment (Refer to 9A.4.7).

9A.7.4 The COL applicant shall design the Service Building fire protection features (Refer to 9A.4.8).

9A.7.5 The COL applicant shall design the Service Water/Water Treatment Building fire protection features (Refer to 9A.4.9).

9A.7.6 The COL holder shall provide detailed design for piping penetrations in the Reactor Building with equivalent construction to tested wall assemblies when penetrating rated fire barriers, or fire testing will be required. The COL licensee shall provide a reliable design for piping penetrations in the Reactor Building with equivalent construction to tested wall assemblies when rated fire barrier testing is required (Refer to 9A.6.1).

9A.7.7 The COL holder shall obtain approval from the appropriate authority having jurisdiction prior to construction for the "alternate method" of fire protection for the unsprinklered Reactor Building, involving underground levels (Refer to 9A.6.6.1), large fire areas (Refer to 9A.6.6.2), three or more stories above grade (Refer to 9A.6.6.3), and lack of exterior access openings for fire department personnel (Refer to 9A.6.6.4).

9A.7.8 The COL holder shall obtain approval from the appropriate authority having jurisdiction prior to construction for the "alternate method" of fire protection for the unsprinklered Fuel Building, involving underground levels (Refer to 9A.6.6.1), large fire areas (Refer to 9A.6.6.2), and lack of exterior access openings for fire department personnel (Refer to 9A.6.6.4).

9A.7.9 The COL holder shall obtain approval from the appropriate authority having jurisdiction prior to construction for the "alternate method" of fire protection for the unsprinklered Control Building, involving underground levels (Refer to 9A.6.6.1) and lack of exterior access openings for fire department personnel (Refer to 9A.6.6.4).

9A.7.10 The COL holder shall obtain approval from the appropriate authority having jurisdiction prior to construction for the "alternate method" of fire protection for the partially sprinklered Turbine Building, involving large fire areas (Refer to 9A.6.6.2).

9A.7.11 The COL holder shall obtain approval from the appropriate authority having jurisdiction prior to construction for the "alternate method" of fire protection for the partially sprinklered Electrical Building, involving three or more stories above grade (Refer to 9A.6.6.3).