CHAPTER 5

ANALYSIS OF CAPABILITY TO ACHIEVE SAFE SHUTDOWN

5.1 METHODOLOGY

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

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

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

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

a. Both reactor units are assumed to be operating normally at 100 percent power prior to the fire. All equipment in the plant is available for operation prior to the onset of the fire.

b. Offsite Power Availability

   1. No credit is taken for loss of offsite power in situations for which a loss of offsite power would be advantageous.

   2. For safe shutdown, as described in 10CFR50, Appendix R, III.G.2, offsite power is assumed to be lost unless it can be demonstrated that it is unaffected by the fire. If offsite power is lost, it is assumed to be unavailable during the first 72 hours after the onset of the fire.

   3. For alternative shutdown, as described in 10CFR50, Appendix R, III.G.3 and III.L, offsite power is

assumed to be unavailable during the first 72 hours after the onset of the fire.

c. Plant accidents and severe natural phenomena are not considered to occur concurrently with a postulated fire or during the subsequent recovery period.

d. Single active component failures other than those failures directly attributable to fire-caused damage are not assumed to occur.

e. The potential consequences of fire-caused damage to electrical cabling are assumed to include circuit failures such as open circuits, short circuits, hot shorts, and shorts to ground. The evaluation of spurious component operation that may result from these circuit failures is limited by the following assumptions:

   (1) Only one circuit failure per system resulting in spurious operation of a component other than a high/low pressure interface valve may occur per system due to a postulated fire in any given fire area.

   (2) Two or more circuit failures resulting in spurious operation of two or more valves in series at a high/low pressure interface may occur due to a postulated fire in any given fire area.

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

g. No credit is taken for manual fire fighting efforts in limiting the spread of a postulated fire within a fire area. The fire is assumed to disable all equipment and damage all electrical cabling located in the fire area, unless the fire hazard analysis demonstrates otherwise. Additionally, any damage caused by the fire fighting or by inadvertent actuation of fixed fire suppression systems is bounded by the damage assumed to be caused by the fire.

h. Manual operation of devices such as valves, circuit breakers, and hand switches may be used by operations personnel in exercising control over shutdown systems, provided that the devices are in accessible locations and staffing levels are adequate to support such actions. The number of plant operators available is assumed to be limited to the minimum number of operators that are required by the Technical Requirements Manual

i. Credit is taken for the capability to close the MSIVs, if required by the event. Any fire affecting the MSIV circuitry will not prevent the valves from closing. Valve closure can be performed manually (in the control room), automatically (by containment isolation signals), or by tripping the air supply or power supplies for the MSIVs solenoid valves.

5.2 DESCRIPTION OF REACTOR SHUTDOWN METHODS

The following sections provide descriptions of methods that can be used for reactor shutdown and cooldown. Although the safe shutdown analysis for the various fire areas places primary emphasis on achievement of reactor shutdown using the methods described below, other means of achieving shutdown might be available. Use of safety-related and nonsafety-related systems not addressed in the safe shutdown analysis, plus manual operation of certain equipment and controls, could provide numerous combinations of systems with adequate capability to safely shut the plant down.

5.2.1 Reactor Shutdown With Balance of Plant Cooling Systems Available

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

If malfunctions due to the effects of a fire occur in any of the systems that are normally used to achieve reactor shutdown with balance of plant cooling systems available, one of the shutdown methods described in Section 5.2.2 will be used to complete the shutdown.

5.2.2 Reactor Shutdown Without Balance of Plant Cooling Systems Available

For the purpose of this safe shutdown analysis, four methods of shutdown that are operable without balance of plant cooling systems available were selected for detailed study. Each of the four shutdown methods includes systems and components necessary to accomplish the major functions of (a) providing makeup water to the reactor vessel, (b) depressurizing the reactor vessel, and (c) removing decay heat and sensible heat from the reactor and primary

containment. Without offsite power, cold shutdown is achieved using the alternate shutdown cooling mode, which minimizes the equipment required for obtaining cold shutdown. This mode precludes depressurizing the reactor to atmospheric pressure, since the reactor pressure must be maintained above the minimum closing pressure of the relief valves. Although the reactor is not vented (see reference 24 in Appendix C), adequate decay heat removal capability is available, to assure that the reactor coolant temperature can be maintained below 212°F. The systems in each shutdown method that are directly relied on for accomplishing these functions are as follows:

Shutdown Method	Makeup	Depres-surization	Heat Removal
A	RCIC	RVs	RHR in the suppression pool cooling mode; and RHR or Core Spray in the alternate shutdown cooling mode
B	HPCI	RVs	RHR in the suppression pool cooling mode; and RHR or Core Spray in the alternate shutdown cooling mode
C	RHR in the LPCI mode OR core spray	RVs	RHR in the suppression pool cooling mode; and RHR or Core Spray in the alternate shutdown cooling mode
D	HPCI	RVs	RHR in the suppression pool cooling and alternate shutdown cooling modes (alternative shutdown)

The individual components that are used for safe shutdown are listed in Table A-3, together with their corresponding fire area locations and safe shutdown system(s). The safe shutdown analysis was performed from a function/system standpoint, as opposed to a safeguard channel standpoint. Functions and support functions were not restricted to the same safeguard channel as the system used to provide reactor inventory. Therefore, some components are associated with only one shutdown method, while most components are associated with all four shutdown methods. Although these components

are associated with all four methods, they are not necessarily required to be available for all cases in which a given shutdown method is relied on, depending on the location of the postulated fire. This flexibility exists because of the redundancies that have been provided at the system and component levels.

The following sections identify the methods used for safe shutdown in each fire area. In those areas where more than one method of safe shutdown is available, the preferred priority of shutdown methodology is A, then B, and then C. Only the first listed method is needed for safe shutdown capability.

A description of each of the four shutdown methods is provided below.

Method A

After closure of the main steam isolation valves, pressure in the reactor vessel is limited by operation of the relief valves which open in the mechanical relief mode when their pressure setpoints are reached. The steam discharged through the relief valves is condensed in the suppression pool. Water level in the reactor is maintained by the RCIC system, using the condensate storage tank, supplemented by the refueling water storage tank, as the source of water supply. The operation of the RCIC system also removes energy from the reactor in the form of steam used to drive the RCIC turbine. In order to limit the temperature rise of the suppression pool due to the steam discharged into it from the RCIC system and the relief valves, one loop of the RHR system is operated in the suppression pool cooling mode. In this mode, water from the suppression pool is circulated through an RHR heat exchanger and then returned to the suppression pool.

In order to initiate operation of the alternate shutdown cooling mode, it is necessary to depressurize the reactor below a nominal pressure of 150 psia. This is accomplished with the relief valves, in the manually controlled mode, to discharge steam to the suppression pool. After the reactor pressure has been stabilized between 150 and 100 psia, the alternate shutdown cooling mode can be placed into operation. This mode of operation is defined slightly differently depending on whether the RHR system or the core spray system is used to provide coolant makeup to the reactor vessel. If the RHR system is being used to provide coolant makeup, the RHR flow path downstream of the heat exchanger is realigned so that water is discharged into the reactor vessel (via the recirculation loop) as well as into the suppression pool, to maintain rated flow through the RHR heat exchanger. This allows one

loop of the RHR system to provide makeup to the vessel in the alternate shutdown cooling mode and also provide suppression pool cooling. Water from the reactor vessel is returned to the suppression pool by maintaining one or more of the relief valves in the open position. If the core spray system is being used to provide makeup to the reactor vessel, the operating loop of the RHR system must remain in the suppression pool cooling mode for decay heat removal. Prior to initiating alternate shutdown cooling, the RCIC turbine is tripped, and the water level in the reactor vessel is increased to the main steam line nozzles, allowing water to fill the main steam lines and then flow through the open relief valves and down the relief valve discharge lines to the suppression pool.

In both the suppression pool cooling mode and the alternate shutdown cooling mode, the heat is transferred from the RHR system to the HPSW system via the RHR heat exchanger. The HPSW system provides the means for dissipating decay heat from the reactor, to maintain it in a cold shutdown condition.

Depending on the location of a fire within the plant, certain operations that are used in shutdown method A may need to be performed manually from outside of the control room. The specific operations involved are identified in Table A-4. Emergency lighting with at least an 8-hour battery power supply has been provided in all areas needed for operation of safe shutdown equipment and access and egress routes thereto. Portable handheld lighting is provided for illumination of access routes between the powerblock and outside buildings.

Method B

After closure of the main steam isolation valves, pressure in the reactor vessel is limited by operation of the relief valves, which open in the mechanical relief mode when their pressure setpoints are reached.

The steam discharged through the relief valves is condensed in the suppression pool. Water level in the reactor is maintained by the HPCI system, using the condensate storage tank, supplemented by the refueling water storage tank, as the source of water supply. The operation of the HPCI system also removes energy from the reactor in the form of steam used to drive the HPCI turbine. In order to limit the temperature rise of the suppression pool due to the steam discharged into it from the HPCI system and the relief valves, one loop of the RHR system is operated in the suppression pool cooling mode. In this mode, water from the suppression pool is circulated

through an RHR heat exchanger and then returned to the suppression pool.

In order to initiate operation of the alternate shutdown cooling mode, it is necessary to depressurize the reactor below a nominal pressure of 150 psia. This is accomplished with the relief valves, in the manually controlled mode, to discharge steam to the suppression pool. After the reactor pressure has been stabilized between 150 and 100 psia (to avoid prematurely tripping the HPCI turbine due to low steam supply pressure), the alternate shutdown cooling mode can be placed into operation. This mode of operation is defined slightly differently depending on whether the RHR system or the core spray system is used to provide coolant makeup to the reactor vessel. If the RHR system is being used to provide coolant makeup, the RHR flow path downstream of the heat exchanger is realigned so that water is discharged into the reactor vessel (via the recirculation loop) as well as into the suppression pool, to maintain rated flow through the RHR heat exchanger. This allows one loop of the RHR system to provide makeup to the vessel in the alternate shutdown cooling mode and also provide suppression pool cooling. Water from the reactor vessel is returned to the suppression pool by maintaining one or more of the relief valves in the open position. If the core spray system is being used to provide makeup to the reactor vessel, the operating loop of the RHR system must remain in the suppression pool cooling mode for decay heat removal. Prior to initiating alternate shutdown cooling, the HPCI turbine is tripped, and the water level in the reactor vessel is increased to the main steam line nozzles, allowing water to fill the main steam lines and then flow through the open relief valves and down the relief valve discharge lines to the suppression pool.

In both the suppression pool cooling mode and the alternate shutdown cooling mode, heat is transferred from the RHR system to the HPSW system via the RHR heat exchanger. The HPSW system provides the means for dissipating decay heat from the reactor, to maintain it in a cold shutdown condition.

Depending on the location of a fire within the plant, certain operations that are used in shutdown method B may need to be performed manually from outside of the control room. The specific operations involved are identified in Table A-4. Emergency lighting with at least an 8-hour battery power supply has been provided in all areas needed for operation of safe shutdown equipment and access and egress routes thereto. Portable handheld lighting is provided for illumination of access routes between the powerblock and outside buildings.

Method C

If neither the RCIC system nor the HPCI system is available to maintain the water level in the reactor vessel, method C is relied on to shut the plant down. This method involves depressurizing the reactor vessel sufficiently so that either the RHR system or the core spray system can inject water into the vessel.

After closure of the main steam isolation valves, pressure in the reactor vessel is limited by operation of the relief valves, which open in the mechanical relief mode when their pressure setpoints are reached. The steam discharged through the relief valves is condensed in the suppression pool. The reactor vessel is depressurized by using three or more relief valves, in the manually controlled mode, to discharge steam to the suppression pool. Coolant injection to the reactor vessel cannot be initiated until vessel pressure has been reduced below the pressure interlock setpoint of the coolant makeup system (core spray or RHR) and below the pump shutoff head of the system. The pressure interlock setpoint is 450 psig for both systems. The pump will start injecting when reactor pressure is 295 psig for the LPCI mode of the RHR system and 289 psig for the core spray system. If the RHR system is used for providing coolant makeup, one loop of the system is placed in the LPCI mode of operation. If the core spray system is to be used for providing coolant makeup, one loop of the system is placed in operation, using either or both of the pumps in that loop.

Depressurization of the reactor vessel during the period before coolant makeup becomes available will cause a decrease in reactor water level. Although the upper portion of the reactor core may be uncovered briefly during this transient, the effect of steam cooling in the core region will limit the fuel cladding temperatures to acceptable values. Therefore, no fuel damage will result from the temporary uncovering of the core.

When the reactor has been depressurized below a nominal pressure of 150 psia, the alternate shutdown cooling mode can be placed into operation. This mode of operation is defined slightly differently depending on whether the RHR system or the core spray system is used to provide coolant makeup to the reactor vessel. In both cases, however, the reactor water level is raised above the main steam line nozzles, allowing water to fill the main steam lines and then flow through the open relief valves and down the relief valve discharge lines to the suppression pool. This establishes a complete loop for liquid flow from the suppression pool to the reactor vessel and back

to the suppression pool. Reactor pressure is maintained by opening or closing relief valves as necessary.

If the RHR system is being used to provide coolant makeup to the reactor vessel, HPSW flow must be established to the RHR heat exchanger in the operating loop. In addition, the RHR flow path downstream of the RHR heat exchanger is realigned so that water is discharged into the suppression pool as well as into the reactor vessel, to maintain rated flow through the RHR heat exchanger. This allows one loop of the RHR system to provide makeup to the vessel in the alternate shutdown cooling mode and also provide suppression pool cooling. If the core spray system is being used to provide coolant makeup to the reactor vessel, one loop of the RHR system must be placed in the suppression pool cooling mode, and HPSW flow must be established to the RHR heat exchanger in that loop. In either case, heat from the water in the suppression pool is transferred to the HPSW system. The HPSW system provides the means for dissipating decay heat from the reactor, to maintain it in a cold shutdown condition.

Depending on the location of a fire within the plant, certain operations that are used in shutdown method C may need to be performed manually from outside of the control room. The specific operations involved are identified in Table A-4. Emergency lighting with at least an 8-hour battery power supply has been provided in all areas needed for operation of safe shutdown equipment and access and egress routes thereto. Portable handheld lighting is provided for illumination of access routes between the powerblock and outside buildings.

Method D

A fire occurring in the control room, the cable spreading room, the computer room, or the emergency shutdown panel area has the potential to prevent safe shutdown from the control room. Therefore, alternative shutdown capability has been provided to ensure that safe shutdown can be achieved in the event of a fire in any of these four zones. Alternative shutdown is referred to as shutdown method D and relies on the use of four types of alternative control stations. Each alternative control station (ACS) includes transfer/isolation switches than can be used to transfer control of the safe shutdown components from the control room to the control switches located on the ACS. The transfer/isolation switches also provide electric circuit isolation between alternative shutdown circuits and circuits that could be affected by a fire in one of the four areas of concern.

The four types of alternative control stations are described as follows:

a. HPCI Alternative Control Stations

There is a HPCI alternative control station for each unit, located in the recirculation pump M-G set room of each unit at elevation 135 feet of the radwaste building. The following features are located on the HPCI ACS:

(1) Control switches, transfer/isolation switches, and a flow controller for the HPCI system.

(2) Control switches and transfer/isolation switches for one loop of the RHR and HPSW systems. The B loop of RHR and HPSW is used for Unit 2. The D loop of RHR and HPSW is used for Unit 3.

(3) Diagnostic instrumentation for the HPCI, RHR, HPSW, and ESW systems.

(4) Reactor process monitoring instrumentation.

(5) Control switches for two relief valves (A and B).

b. Emergency Switchgear Alternative Control Stations

There are two switchgear alternative control stations for each unit. The stations are located in the B and D 4 kV emergency switchgear rooms, at switchgear units 20A16 and 20A18 for Unit 2 and at switchgear units 30A16 and 30A18 for Unit 3. The following ACS features are located on the front panels of the respective switchgear cubicles:

(1) Transfer/isolation switches and control switches for the diesel generator circuit breakers (safeguard channels B and D).

(2) Transfer/isolation switches and control switches for the load center circuit breakers (safe guard channels B and D).

(3) Transfer/isolation switch and control switch for the 2B and 3D RHR pumps (safeguard channels 2B and 3D, respectively).

(4) Transfer/isolation switch and control switch for the 2B and 3D HPSW pumps (safeguard channels 2B and 3D, respectively).

(5) Transfer/isolation switch and control switch for the A ESW pump (Unit 2 only).

c. Diesel Generator Alternative Control Stations

Alternative control stations are provided for the B and D diesel generators. Since the diesel generators are common to both units, the alternative control stations for the diesel generators are also common to both units. The ACS for the B diesel generator is located in the Unit 2 B 4 kV emergency switchgear room. The ACS for the D diesel generator is located in the Unit 2 D 4 kV emergency switchgear room. Each ACS includes transfer/isolation switches and provides means for manually controlling diesel start, diesel stop, voltage adjustment, and governor speed adjustment.

d. Automatic Depressurization System (Relief Valve) Alternative Control Stations

There are two ADS alternative control stations for each unit each consisting of two panels. The stations are located in the A and B 4 kV emergency switchgear rooms. The following features are located on the alternative control stations:

(1) Transfer/isolation switches for two relief valves (A and B) that isolate potentially damaged circuits and transfer control of these valves to the HPCI ACS.

Isolation switches for 3 relief valves (E, H, and J) that isolate potentially damaged circuits.

(2) An isolation switch for one relief valve (K) that isolates potentially damaged circuits from the control room.

Isolation switches for 5 relief valves (C, D, F, G, and L) that isolate potentially damaged circuits.

(3) A transfer/isolation switch for the Unit 3 RHR B Loop cross-tie valve that isolates potentially damaged circuits from the control room and transfers control of this valve to the Unit 3 RHR ACS.

When the decision has been made to shut the plant down from outside the control room because of a fire in either the control room, cable spreading room, computer room, or emergency shutdown panel area, the operators will scram the reactor and close the main steam isolation valves before leaving the control room. The operators will then proceed to the various alternative control stations and operate the transfer/isolation switches to take manual control of the systems needed for achieving safe shutdown.

After closure of the main steam isolation valves, pressure in the reactor vessel is limited by operation of the relief valves, which open in the mechanical relief mode when their pressure setpoints are reached. The steam discharged through the relief valves is condensed in the suppression pool. Water level in the reactor is maintained by the HPCI system, using the condensate storage tank, supplemented by the refueling water storage tank, as the source of water supply. The operation of the HPCI system also removes energy from the reactor in the form of steam used to drive the HPCI turbine. In order to limit the temperature rise of the suppression pool due to the steam discharged into it from the HPCI system and the relief valves, one loop of the RHR system is operated in the suppression pool cooling mode. In this mode, water from the suppression pool is circulated through an RHR heat exchanger and then returned to the suppression pool.

In order to initiate operation of the alternate shutdown cooling mode of the RHR system, it is necessary to depressurize the reactor below a nominal pressure of 150 psia. This is accomplished by using the relief valves, in the manually controlled mode, to discharge steam to the suppression pool. After the reactor pressure has been stabilized between 150 and 100 psia (to avoid prematurely tripping of the HPCI turbine due to low steam supply pressure), the operating loop of the RHR system is switched from the suppression pool cooling mode to the alternate shutdown cooling mode. This is accomplished by realigning the flow path downstream of the RHR heat exchanger so that water is discharged into the reactor vessel (via the recirculation loop) as well as into the suppression pool, to maintain rated flow through the RHR heat exchanger. This allows one loop of the RHR system to provide makeup to the vessel in the alternate shutdown cooling mode and also provide suppression pool cooling. Water from the reactor vessel is returned to the suppression pool by maintaining one or more of the relief valves in the open position. The water level in the reactor vessel rises to the main steam line nozzles, allowing water to fill the main steam

lines and then flow through the open relief valves and down the relief valve discharge lines to the suppression pool.

Once the alternate shutdown cooling mode has been placed into operation, the HPCI system is shut down.

In both the suppression pool cooling mode and the alternate shutdown cooling mode, heat is transferred from the RHR system to the HPSW system via the RHR heat exchanger. The HPSW system provides the means for dissipating decay heat from the reactor, to maintain it in a cold shutdown condition.

Emergency lighting with at least an 8-hour battery power supply has been provided in all areas needed for operation of safe shutdown equipment and access and egress routes thereto. Portable handheld lighting is provided for illumination of access routes between the powerblock and outside buildings.

The Alternative Control Stations are provided with station battery-backed lights. The batteries and their chargers are protected from a fire in the control room, the cable spreading room, the computer room, or the emergency shutdown panel area.

5.3 SAFE SHUTDOWN ANALYSIS BY FIRE AREA

5.3.1 Fire Area 1: Unit 2 - A and C RHR Heat Exchanger and Pump Rooms (Elev. 91'-6" and 116'-0") Stairwell No. 26 (Elev. 135'-0" to 234'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	NE - Reinforced concrete	3-hr
	E - Reinforced concrete (part adjacent to fire area 5)	3-hr
	E - Reinforced concrete (part adjacent to fire area 6S)	3-hr
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced Concrete (exterior wall)	none
	S - Reinforced concrete (elev. 135'-0" and above)	3-hr
	W - Reinforced concrete (exterior wall)	none
	W - Reinforced concrete (exterior wall, elev. 135'-0" and above)	2-hr
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Reinforced concrete (part adjacent to liquid nitrogen storage (LNS) building. Only fire area 1 is adjacent to the one LNS building at an unrated barrier.)	none
	Reinforced concrete (RHR Room C)	3-hr
	Metal deck, nonreinforced concrete and built-up roofing	none
Access:	Door connecting to fire area 5 Doors connecting to stairwell no. 26	

(b) Major Components in Fire Area

2AE124	RHR Pump Seal Water Cooler HX
2AE24	RHR Heat Exchanger
2AV-25	RHR Pump Room Cooling Fan
2BV-25	RHR Pump Room Cooling Fan

FT2-10-109A	RHR Flow Transmitter
M02-10-89A	RHR HX Discharge Valve
2CE24	RHR Heat Exchanger
2CV25	RHR Pump Room Cooling Fan
2DV25	RHR Pump Room Cooling Fan
DPT2-10-91A	RHR Differential Pressure Transmitter
M02-10-015C	RHR Shutdown Cooling Suction Valve
M02-10-89C	RHR HX Discharge Valve
2AP35	RHR Pump A
M02-10-013A	LPCI Suction Isolation Valve
M02-10-015A	RHR Shutdown Cooling Suction Valve
M02-10-016A	RHR Pump Discharge Bypass Valve
2CE124	RHR Pump Seal Water Cooler HX
2CP35	RHR Pump C
M02-10-013C	LPSI Suction Isolation Valve
M02-10-016C	RHR Pump Discharge Bypass Valve
AO-8098A	RHR Sample Line Isolation Valve
AO-8099A	RHR Sample Line Isolation Valve
AO-8098C	RHR Sample Line Isolation Valve
AO-8099C	RHR Sample Line Isolation Valve
PS2-10-120A	RHR Auto Blowdown Interlock
PS2-10-120C	RHR Auto Blowdown Interlock
PS2-10-120E	RHR Auto Blowdown Interlock

PS2-10-120G RHR Auto Blowdown Interlock

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Lube oil from RHR pumps motors either leaking onto the floor with subsequent ignition of the oil or an overheating of the pump causing ignition of the oil.

(3) Since no combustible material is located in stairwell no. 26, the origin of a postulated fire in the stairwell is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire in the RHR pump rooms will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 1 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Units 2 and 3 are related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Units 2 and 3 has redundant components that are not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 1, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Appendix R, Section III.G.2 was requested and granted by the NRC in an SER dated December 31, 1986 regarding the structural steel supporting the fire barrier in the ceiling of the Unit 2 C RHR Room. Subsequent review has determined

that the ceiling of this room does not form a fire area boundary for Appendix R compliance. Therefore, the portion of the exemption request for the ceiling of the Unit 2 C RHR pump room was unnecessary as documented in ECR 03-00604.

5.3.2 Fire Area 2: Unit 2 - B and D RHR Heat Exchanger and Pump Rooms (Elev. 91'-6" and 116'-0"). Unit 3 - A and C RHR Heat Exchanger and Pump Rooms (Elev. 91'-6" and 116'-0"); Stairwell No. 25 (Elev. 91'-6" to 135'-0"). Units 2 and 3 - HPCI Pump Rooms, Reactor Sump Pump Rooms, RCIC Pump Areas (Elev. 88'-0"); Cooling Water Equipment Rooms (Elev. 116'-0"). Radwaste Building - Standby Gas Treatment Room, Waste Sludge Pump Room, Waste Sludge Tank Room, Floor Drain Collector Tank and Waste Collector Tank Room, Spent Resin Pump Room, Spent Resin Tank Room, Chemical Waste Tank Room, Collector Pump Room, Tank and Pump Area (Elev. 91'-6"); Waste Surge Tank Room (Elev. 108'-0"); Condensate Tank Rooms, Condensate Pump Rooms, Filter Holding Pump Room, Corridor, Laundry Room, Chemical and Funnel Storage, Demineralizer Room, Filter Rooms (Elev. 116'-0"); Medical Station, Radwaste Control Room, Filter Room, Personnel Decontamination Station, Radwaste Drummed Waste and Storage Area (Elev. 135'-0"); Hopper Compartments, Sample Tank and Pump Room, Radwaste H&V Equipment Compartment (Elev. 150'-0"); Centrifuges, Absorbent Feeder Rooms, Radwaste Exhaust Fan Rooms (Elev. 165'-0"); Stairwell No. 34 (Elev. 91'-6" to 165'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete	3-hr
	NE	- Reinforced concrete	3-hr
	E	- Reinforced concrete	3-hr
	E	- Reinforced concrete (part adjacent to fire area 4)	2-hr
	SE	- Reinforced concrete	3-hr
	S	- Reinforced concrete	3-hr
	S	- Reinforced concrete (part adjacent to fire area 4)	2-hr
	W	- Reinforced concrete (exterior wall)	none
	W	- Reinforced concrete (part adjacent to fire area 4)	3-hr

	W - Reinforced concrete (part adjacent to fire zone 4-6)	2-hr
Floor:	Reinforced concrete foundation mat	none
	Reinforced concrete (elev. 116'-0" to 165'-0")	none
Ceiling:	Reinforced concrete (elev. 91'-6" to 135'-0")	none
	Reinforced concrete (Unit 2 cooling water equipment room, elev. 116'-0"; radwaste H&V equipment compartment, elev. 150'-0") [Structural steel members adjacent to fire area 25, elev. 150'-0" will be coated with structural steel fire proofing.]	3-hr
	Metal deck, nonreinforced concrete and built-up roofing	none
Access:	Two doors connecting to fire area 5	
	Doors connecting to stairwell Nos 24, 25, and 34	
	Two doors connecting to fire area 12	
	Four doors connecting to fire area 50	
	Door connecting to fire area 25	
	Door connecting to fire area 57	

(b) Major Components in Fire Area

2BE124	RHR Heat Exchanger
2EV25	RHR Pump Room Cooling Fan
2FV25	RHR Pump Room Cooling Fan
MO2-10-015B	RHR Shutdown Cooling Suction Valve
M02-10-89B	RHR HX Discharge Valve
TT-2442B	Suppression Pool Temperature Transmitter
2DE124	RHR Pump Seal Water Cooler HX
2DE24	RHR Heat Exchanger
2GV25	RHR Pump Room Cooling Fan
2HV25	RHR Pump Room Cooling Fan
FT2-10-109B	RHR Flow Transmitter
M02-10-89D	RHR HX Discharge Valve
20D12	RCIC Motor Control Center
MCC20B39	2D Motor Control Center
M0-2972	ESW Header Isolation Valve
PT-7465	ESW Pressure Transmitter
3AE24	RHR Heat Exchanger
3AV25	RHR Pump Room Cooling Fan

3BV25	RHR Pump Room Cooling Fan
DPT3-10-91C	RHR/HPSW Differential Pressure Transmitter
FT3-10-109A	RHR Flow Transmitter
MO3-10-89A	RHR HX Discharge Valve
3CE24	RHR Heat Exchanger
3CV25	RHR Pump Room Cooling Fan
3DV25	RHR Pump Room Cooling Fan
MO3-10-015C	RHR Shutdown Cooling Suction Valve
MO3-10-89C	RHR HX Discharge Valve
TT-3442B	Suppression Pool Temperature Transmitter
3OD12	RCIC Motor Control Center
MCC30B36	3A Motor Control Center
MO-3972	ESW Header Isolation Valve
00Y03	Distribution Panel
3AE124	RHR Pump Seal Water Cooler HX
3AP35	RHR Pump A
MO3-10-013A	LPCI Suction Isolation Valve
MO3-10-015A	RHR Shutdown Cooling Suction Valve
MO3-10-016A	RHR Pump Discharge Bypass
3CE124	RHR Pump Seal Water Cooler HX
3CP35	RHR Pump C
MO3-10-013C	LPCI Suction Isolation Valve
MO3-10-016C	RHR Pump Discharge Bypass
2BE124	RHR Pump Seal Water Cooler HX
2BP35	RHR Pump B
LT-8123B	Suppression Pool Water Level Transmitter
MO2-10-013B	LPSI Suction Isolation Valve
MO2-10-016B	RHR Pump Discharge Bypass Valve
FT3-13-058	RCIC Pump Discharge Flow Transmitter
FT3-23-082	HPCI Pump Discharge Flow Transmitter
FT3-23-141	HPCI Flow Transmitter
MO3-14-070	Torus Water Cleanup Suction Valve
MO3-14-071	Torus Water Cleanup Suction Valve
PS3-23-84-1	HPCI Pump Low Suction Pressure Alarm Switch
PS3-23-97A	HPCI Turbine Exhaust High Pressure Alarm Switch
PS3-23-97B	HPCI Turbine Exhaust High Pressure Alarm Switch
PT3-23-142	HPCI Pump High Discharge Pressure Transmitter
PT3-23-89	HPCI Steam Supply Pressure Transmitter
3AV22	RCIC Pump Room Cooling Fan
3BV22	RCIC Pump Room Cooling Fan
3OE32	RCIC Condenser
3OP46	RCIC Vacuum Pump

3OP48	RCIC Condensate Pump
3OS38	RCIC Turbine
AO-3333A	RCIC Pump Room Cooler HX Valve
AO-3333B	RCIC Pump Room Cooler HX Valve
HO-5495	RCIC Turbine Stop Valve
MO-5487	RCIC Turbine Trip and Throttle Valve
MO3-13-018	RCIC Pump Suction From CST
MO3-13-020	Outboard RCIC Discharge Isolation Valve
MO3-13-027	RCIC Minimum Flow Bypass to Torus
MO3-13-039	RCIC Pump Suction From Torus
MO3-13-041	RCIC Pump Suction From Torus
MO3-13-131	RCIC Steam to Turbine Isolation Valve
MO3-13-132	RCIC Lube Oil Cooler Isolation Valve
3AV23	HPCI Pump Room Cooling Fan
30C873	HCPI Aux Relay Control Panel
3BV23	HPCI Pump Room Cooling Fan
30D41	HPCI Gland Seal CDSR Vacuum Pump Starter
3OK02	HPCI Vacuum Pump
30D43	HPCI Aux Lube Oil Pump Starter
3OP26	HPCI Auxiliary Lube Oil Pump
30D42	HPCI Gland Seal CDSR Cond Pump Starter
3OP28	HPCI Condensate Pump
30S676	HPCI Governor Control Box
3OS37	HPCI Turbine
HO-5512	HPCI Turbine Control Valve
HO-5513	HPCI Turbine Stop Valve
MO3-23-014	HPCI Steam Line to Turbine
MO3-23-017	HPCI Pump Suction From CST
MO3-23-020	Outboard HPCI Pump Discharge Valve
MO3-23-025	HPCI Minimum Recirc to Torus
MO3-23-057	HPCP Pump Suction From Torus
MO3-23-058	HPCI Pump Suction From Torus
SPE-5505	HPCI Turbine Speed Transmitter
SV3-23-054	Condenser Drain Pot Drain Valve
2DP35	RHR Pump D
2HE58	RHR Pump Room Cooler HX
MO2-10-013D	LPCI Suction Isolation Valve
MO2-10-015D	RHR Shutdown Cooling Suction Valve
MO2-10-106D	RHR Pump Discharge Bypass Valve
2AV23	HPCI Pump Room Cooling Fan
2BV23	HPCI Pump Room Cooling Fan
2OK02	HPCI Vacuum Pump
2OP26	HPCI Auxiliary Lube Oil Pump
2OP28	HPCI Condensate Pump
2OS37	HPCI Turbine
AO-2334A	HPCI Pump Room Cooler HX Valve
AO-2334B	HPCI Pump Room Cooler HX Valve

HO-4512	HPCI Turbine Control Valve
HO-4513	HPCI Turbine Stop Valve
MO2-23-014	HPCI Steam Line to Turbine
MO2-23-017	HPCI Pump Suction From CST
MO2-23-020	Outboard HPCI Pump Discharge Valve
MO2-23-025	HPCI Minimum Recirc to Torus
MO2-23-057	HPCI Pump Suction From Torus
MO2-23-058	HPCI Pump Suction From Torus
SV2-23-054	Condenser Drain Pot Drain Valve
2AV22	RCIC Pump Room Cooling Fan
2BV22	RCIC Pump Room Cooling Fan
2OE32	RCIC Condenser
2OP46	RCIC Vacuum Pump
2OP48	RCIC Condensate Pump
2OS38	RCIC Turbine
HO-4495	RCIC Turbine Stop Valve
MO-4487	RCIC Turbine Trip and Trottle Valve
MO2-13-018	RCIC Pump Suction From CST
MO2-13-020	Outboard RCIC Discharge Isolation Valve
MO2-13-027	RCIC Minimum Flow Bypass To Torus
MO2-13-039	RCIC Pump Suction From Torus
MO2-13-041	RCIC Pump Suction From Torus
MO2-13-131	RCIC Steam To Turbine Isolation Valve
MO2-13-132	RCIC Lube Oil Cooler Isolation Valve
FT2-13-058	RCIC Pump Discharge Flow Transmitter
FT2-23-082	HPCI Pump Discharge Flow Transmitter
MO2-14-070	Torus Water Cleanup Suction Valve
MO2-14-071	Torus Water Cleanup Suction Valve
PT2-23-89	HPCI Steam Supply Pressure Transmitter
SV-4960A	CAD Analysis
SV-4961A	CAD Analysis
O_2E-4963A	CAD Analysis
H_2E-4965A	CAD Analysis
FIT-4954	CAD Bleed
AO-8098B	Vent Stack Iodine Monitor
AO-8099B	RHR Sample Isolation
AO-8098D	Vent Stack Iodine Monitor
AO-8099D	RHR Sample Isolation
PS2-10-120B	RHR Auto Blowdown Interlock
PS2-10-120D	RHR Auto Blowdown Interlock
PS2-10-120F	RHR Auto Blowdown Interlock
PS2-10-120H	RHR Auto Blowdown Interlock
PS3-10-120A	RHR Auto Blowdown Interlock
PS3-10-120C	RHR Auto Blowdown Interlock
PS3-10-120E	RHR Auto Blowdown Interlock
PS3-10-120G	RHR Auto Blowdown Interlock
AO-9098A	Vent Stack Iodine Monitor

AO-9099A	RHR Sample Isolation
AO-9098C	Vent Stack Iodine Monitor
AO-9099C	RHR Sample Isolation
FIT-5954	CAD Bleed
H_2E-5965A	CAD Analysis
O_2E-5963A	CAD Analysis
SV-5960A	CAD Analysis
SV-59611	CAD Analysis
MO2-10-174	RHR Service Water Crosstie
MO2-10-176	RHR Service Water Crosstie
DPIS2-10-121B	RHR Pump Recirc Flow
DPIS2-10-121D	RHR Pump Recirc Flow
DPIS3-10-121A	RHR Pump Recirc Flow
DPIS3-10-121B	RHR Pump Recirc Flow
DPIS3-10-121C	RHR Pump Recirc Flow
MO3-10-174	RHR Service Water Crosstie
MO3-10-176	RHR Service Water Crosstie
TE-5936A	RCIC Steam Leak Detection
TE-5936B	RCIC Steam Leak Detection
TE-5936C	RCIC Steam Leak Detection
TE-5936D	RCIC Steam Leak Detection
AO3-23-042	HPCI Steam Line Drain
AO3-23-043	HPCI Steam Line Drain
AO2-23-042	HPCI Steam Line Drain
AO2-23-043	HPCI Steam Line Drain
SV20469-1	HPCI Steam Line Drain
SV20469-2	HPCI Steam Line Drain
SV20470-1	HPCI Steam Line Drain
SV20470-2	HPCI Steam Line Drain
TE-4941A	HPCI Steam Leak Detection
TE-4941B	HPCI Steam Leak Detection
TE-4941C	HPCI Steam Leak Detection
TE-4941D	HPCI Steam Leak Detection
TE-4936A	RCIC Steam Leak Detection
TE-4936B	RCIC Steam Leak Detection
TE-4936C	RCIC Steam Leak Detection
TE-4936D	RCIC Steam Leak Detection
DPIS2-13-083	RCIC Steam Line Diff Press
DPIS2-13-084	RCIC Steam Line Diff Press
DPIS2-23-76	HPCI Steam Line Diff Press
DPIS2-23-77	HPC Steam Line Diff Press
PS2-23-84-1	HPCI Pump Suction Low Trip
PS2-23-97A	HPCI Pump Turbine Exhaust
PS2-23-68B	HPCI Pump Turbine Steam Press
PS2-23-68C	HPCI Pump Turbine Steam Press
PS2-23-68D	HPCI Pump Turbine Steam Press
TE-5941A	HPCI Steam Leak Detection

TE-5941B	HPCI Steam Leak Detection
TE-5941C	HPCI Steam Leak Detection
TE-5941D	HPCI Steam Leak Detection
CV3-10-3677A	RHR A Flow Control Valve
CV3-10-3677C	RHR C Flow Control Valve
MO3-10-33452A	RHR A/C Cross-Tie Isolation Valve
2AG020	Adjustable Speed Drive 2A
2BG020	Adjustable Speed Drive 2B

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Lube oil from Units 2 and 3- RHR pumps, HPCI pumps, RCIC pumps either leaking onto the floor with subsequent ignition of the oil or an overheating of the pumps causing ignition of the oil.

(3) Charcoal filters in the SGTS air plenum.

(4) Spent charcoal filters in filter room 238.

(5) Ignition of trash in the radwaste drummed waste and storage area from an external source.

(6) Ignition of paper in the radwaste control room from an external source.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation in the main control room. The smoke generated by a fire in the RHR pump rooms will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. Smoke from a fire in the HPCI rooms will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. The CO_2 system can be manually actuated by the fire brigade in the RCIC room. Heat from a fire at the SGTS charcoal filters will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. The deluge system is manually activated for the filter involved. A signal from any smoke detector in the Unit 2 Reactor Building cooling water equipment room will open a

deluge valve, thus supplying water under pressure to closed sprinkler heads located above the M-G set lube oil pumps. A fire under the sprinkler system will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open and extinguish the fire. The system can be manually actuated by the fire brigade to supply water to the sprinklers. The sprinkler system in the Unit 3 Reactor Building Cooling Water equipment room above the MG Set Lube Oil pumps has been removed per ECR 13-00338. A fire in the drummed waste and storage area of the radwaste building will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. Water from the wet pipe sprinkler system will flow out of the open head(s) to extinguish the fire. Flow of water through an alarm check valve will energize a flow switch that transmits an alarm to the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 2 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method C for Units 2 and 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method C for Units 2 and 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary buses is not affected by a fire in this area. Offsite power to the 4kV switchgear via the 00A020 emergency auxiliary bus may be affected by a fire in this area.

Therefore, for a fire in Fire Area 2, shutdown method C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) In accordance with Generic Letter 86-10, a fire hazard analysis has been performed to demonstrate that the 10-gauge metal deck ceiling between areas 2 and 25 provides

a fire resistance equivalent to that required by the barrier (see reference 10 in Appendix C and section 5.3.19(f)(8)). The analysis credits low combustible loading.

(2) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C and section 5.3.19.(f)(1))for a steel angle between fire areas 02 and 25. A 4 inch high by 1/4 inch thick steel angle traverses the top of the wall between the two fire areas for its entire length. The basis for the exemption was the fire barrier geometry and combustible loading.

(3) An exemption was granted from Section III.F of Appendix R by the NRC in the SER dated March 13, 1985, for lack of fire detection in the chemical waste tank room, elevation 91'-6". The only safety-related equipment in the room is cable in conduit. There are no fixed combustibles in the room, which is normally locked closed due to extremely high radiation levels.

(4) An exemption was granted by the NRC in an SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the south wall of the Unit 2 HPCI pump room. Early warning fire detection is provided. Combustible loading is low.

(5) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for the standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of dampers in two ducts through the north wall of the reactor sump pump room (fire zone 2-64) could jeopardize secondary containment capability in the event of a reactor building isolation. Combustible loading is low and chance of transmission of smoke through the ducts is low.

(6) An exemption was granted from Section III.G.2 of Appendix R by the NRC in the SER dated December 31, 1986, for a 1.5-hour-rated fire damper located outside a 3-hour barrier on each side of the wall in lieu of a 3-hour damper. The dampers were located outside the barrier in two ducts in the east wall of fire zone 2-61. The duct is

manufactured from schedule 40 steel. Combustible loading on each side of the barrier is low.

(7) An exemption from the requirements of Section III.G.2 of Appendix R was granted by the NRC in an SER dated December 31, 1986 (see reference 18 in Appendix C and section 5.3.19.(f)(5)), for heating and ventilation ducts passing through a fire barrier without a 3 hour rated fire damper. The ducts penetrate the west wall of the remote shutdown panel area duct chase, elevation 150'-0" and the radwaste building heating and ventilating compartment. The installation of a damper in either of the ducts would potentially contaminate clean radiological areas and expose workers to unacceptable radiation hazards. Combustible loading in the area is low with most of the combustibles associated with cable tray near the ceiling of the remote shutdown panel area.

(8) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in the SER dated December 31, 1986, for protecting structural steel forming a part of or supporting fire barriers to provide fire resistance equivalent to that required of the barrier for both the Units 2 and 3 HPCI rooms, fire zone 2-59 and 2-62, respectively. The CO_2 system in each room will ensure that a fire is controlled quickly. However, there is no structural steel in the HPCI room that supports a fire area boundary. Therefore, an exemption is no longer necessary and the CO_2 system is not needed to support the exemption.

(9) An evaluation was done for the bus duct penetrating the wall between fire areas 02 and 57. The evaluation determined that the barrier is adequate for the fire hazard. The basis credits low combustible loading.

(10) ECR-NCR 99-02669 addresses the acceptability of a 1.5 hour rated fire door in the stairwell barrier that separates the M-G set room (fire area 58) from Stair tower 25 (fire area 2). The acceptability is based in part on the normal use of 1.5 rated doors in stair towers.

(11) ECR 04-00077 and 04-00078 address the change of the HPCI Pump Room CO_2 fire suppression systems from automatic to manual initiation. These ECRs include a technical

evaluation that provides the justification for this change.

(12) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

(13) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.3 Fire Area 4: Unit 2 - Stairwell No. 24 (Elev. 91'-6" to 135'-0"); Recirculation Pump M-G Set Room (Elev. 135'-0")

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (part adjacent to fire area 2)	2-hr
	N - Reinforced concrete (part elev. 135'-0")	3-hr
	E - Reinforced concrete (part adjacent to fire area 2)	2-hr
	E - Reinforced concrete (part adjacent to fire area 57 elev. 135'-0")	3-hr
	S - Reinforced concrete	3-hr
	W - Reinforced concrete (part adjacent to fire area 2)	2-hr
	W - Reinforced concrete (exterior wall	none
Floor:	Reinforced concrete foundation mat	none
	Reinforced concrete (elev. 135'-0")	3-hr
Ceiling:	Reinforced concrete	3-hr

Access: Door connecting to stairwell no. 24
Doors connecting M-G set room to fire area 2

(b) Major Components in Fire Area

20CO4BX	HPCI Alternative Control Station
20C873	HPCI Aux Relay Control Panel
20D41	HPCI Gland Seal CDSR Vacuum Pump Starter
20D42	HPCI Gland Seal CDSR Cond Pump Starter
20D43	HPCI Aux Lube Oil Pump Starter
20S676	HPCI Governor Control Box

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Deleted.

(3) Since no combustible material is located in stairwell no. 24, the origin of a postulated fire in the stairwell is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation in the main control room. A signal from any smoke detector in the area will open a deluge valve, thus supplying water under pressure to closed sprinkler heads. A fire under the sprinkler system will melt the fusible link on the directional spray nozzles and pendent sprinkler heads at a predetermined temperature, causing the heads to open and extinguish the fire. The system can be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 4 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method C for Unit 2 and shutdown methods A, B, and C for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any

functions that could be lost. Equipment located in this fire area that is associated with shutdown method C for Unit 2 and shutdown methods A, B, and C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary bus may be affected by a fire in this area. Offsite power to the 4kV switchgear via the 00A020 emergency auxiliary bus is not affected by a fire in this area.

Therefore, for a fire in Fire Area 4, shutdown method C will be available to safely shut down Unit 2 and shutdown methods A, B, and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986, for protecting structural steel forming a part of or supporting fire barriers to provide fire resistance equivalent to that required of the barrier. The existing sprinkler system in the M-G set room provides floor area coverage for an oil fire and is sufficient to protect against fire from other combustibles located in the room. A fire from combustibles other than oil which could adversely the structural steel is not considered credible.

(2) An exemption from Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see references 10 and 20 in Appendix C and section 5.3.46) for a fire barrier between area 4 and area 57. A smoke tight porcelain through bushing is provided in a 14-gauge steel bus duct between fire area 4 and fire area 57. The bushing has not been tested to demonstrate its ability to withstand a 3 hour fire. The automatic sprinkler system provides full room coverage in the M-G set room which contains the greatest fire hazard. The combination of the steel bus duct, porcelain bushing, and the sprinkler system will provide adequate resistance for preventing the spread of fire.

(3) In a letter from the licensee to the NRC dated September 16, 1983 (see reference 25 in Appendix C) the licensee

identified that detection would not be installed in stairwell 24 (fire area-zone 4-6) in accordance with Appendix R, section III.F. In lieu of detection, a 3 hour rated barrier was installed to protect the safety related raceway in the area.

(4) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

5.3.4 Fire Area 5: Unit 2 - A, B, and C Core Spray Pump Rooms (Elev. 91'-6"), Stairwell No. 18 (Elev. 91'-6" to 116'-0"); Torus Area (Elev. 91'-6"); North and South Vacuum Breaker Areas (Elev. 116'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (parts adjacent to fire areas 4 and 2)	3-hr
	N - Reinforced concrete (part adjacent to fire area 9)	2-hr
	E - Reinforced concrete (part adjacent to fire area 50)	3-hr
	E - Reinforced concrete (part adjacent to fire area 9)	2-hr
	S - Reinforced concrete (exterior wall)	none
	SW - Reinforced concrete	3-hr
	W - Reinforced concrete (exterior wall)	none
	NW - Reinforced concrete	3-hr
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Reinforced concrete, exterior boundary	none
	Reinforced concrete (contains two open gratings adjacent to fire area 6S, 40 sq ft and 87 sq ft respectively, and a 50 sq ft open grating adjacent to the combustible free zone (CFZ) between fire areas 6N and 6S in the west corridor, unrated)	3-hr

One structural steel member in fire zone 5-5G and two in 5-5F will be coated with structural steel fire proofing.)

Access: Door connecting to fire area 9
Doors connecting to fire area 1
Two doors connecting to fire area 2
Two doors connecting to fire area 50

(b) Major Components in Fire Area

MO-4244	Vacuum Breaker Valves
MO-4244A	Vacuum Breaker Valves
MO2-10-034A	RHR Supply To Torus
MO2-10-034B	RHR Supply To Torus
MO2-10-039A	RHR Supply To Torus
MO2-10-039B	RHR Supply To Torus
MO2-10-154	RHR Recirc Loop A Return Valve
MO2-10-154B	RHR Recirc Loop B Return Valve
MO2-13-030	RCIC Test Bypass to CST
MO2-14-026A	Core Spray Test Bypass Valve
MO2-14-026B	Core Spray Test Bypass Valve
MO2-23-021	HPCI Test Bypass to CST
MO2-23-024	HPCI Redundant Test Bypass to CST
MO2-23-031	HPCI Flush Line Shutoff To Torus
TE-2-2-71A1	Torus Temperature Element
TE-2-2-71A2	Torus Temperature Element
TE-2-2-71B1	Torus Temperature Element
TE-2-2-71B2	Torus Temperature Element
TE-2-2-71C1	Torus Temperature Element
TE-2-2-71C2	Torus Temperature Element
TE-2-2-71D1	Torus Temperature Element
TE-2-2-71D2	Torus Temperature Element
TE-2-2-71E1	Torus Temperature Element
TE-2-2-71E2	Torus Temperature Element
TE-2-2-71F1	Torus Temperature Element
TE-2-2-71F2	Torus Temperature Element
TE-2-2-71G1	Torus Temperature Element
TE-2-2-71G2	Torus Temperature Element
TE-2-2-71H1	Torus Temperature Element
TE-2-2-71H2	Torus Temperature Element
TE-2-2-71J1	Torus Temperature Element
TE-2-2-71J2	Torus Temperature Element
TE-2-2-71K1	Torus Temperature Element
TE-2-2-71K2	Torus Temperature Element
TE-2-2-71L1	Torus Temperature Element
TE-2-2-71L2	Torus Temperature Element

TE-2-2-71M1	Torus Temperature Element
TE-2-2-71M2	Torus Temperature Element
TE-2-2-71N1	Torus Temperature Element
TE-2-2-71N2	Torus Temperature Element
TE-2442A	Torus Temperature Element
TE-2442B	Torus Temperature Element
2DE133	Core Spray Pump Motor Oil Cooler HX
2DP37	Core Spray Pump
2GE57	Core Spray Pump Room Cooler HX
2GV24	Core Spray Pump Room Cooling Fan
2HE57	Core Spray Pump Room Cooler HX
2HV24	Core Spray Pump Room Cooling Fan
AO-2336G	Core Spray Pump Room Cooler HX Valve
AO-2336H	Core Spray Pump Room Cooler HX Valve
MO2-14-05D	Core Spray Minimum Bypass Valve
MO2-14-07D	Core Spray Pump Suction Valve
FT2-14-40B	Core Spray Flow Transmitter
FT2-14-40A	Core Spray Flow Transmitter
2CE133	Core Spray Pump Motor Oil Cooler HX
2CE57	Core Spray Pump Room Cooler HX
2CP37	Core Spray Pump
2CV24	Core Spray Pump Room Cooling Fan
2DE57	Core Spray Pump Room Cooler HX
2DV24	Core Spray Pump Room Cooling Fan
AO-2336C	Core Spray Pump Room Cooler HX Valve
AO-2336D	Core Spray Pump Room Cooler HX Valve
MO2-14-05C	Core Spray Minimum Bypass Valve
MO2-14-07C	Core Spray Pump Suction Valve
2AE133	Core Spray Pump Motor Oil Cooler HX
2AE57	Core Spray Pump Room Cooler HX
2AP37	Core Spray Pump
2AV24	Core Spray Pump Room Cooling Fan
2BE57	Core Spray Pump Room Cooler HX
2BV24	Core Spray Pump Room Cooling Fan
AO-2336A	Core Spray Pump Room Cooler HX Valve
AO-2336B	Core Spray Pump Room Cooler HX Valve
MO2-14-05A	Core Spray Minimum Bypass Valve
MO2-14-07A	Core Spray Pump Suction Valve
2BE133	Core Spray Pump Motor Oil Cooler HX
2BP37	Core Spray Pump
2EE57	Core Spray Pump Room Cooler HX
2EV24	Core Spray Pump Room Cooling Fan
2FE57	Core Spray Pump Room Cooler HX
2FV24	Core Spray Pump Room Cooling Fan
AO-2336E	Core Spray Pump Room Cooler HX Valve
AO-2336F	Core Spray Pump Room Cooler HX Valve
LT-8027A	Torus Water Level Transmitter

LT-8027B	Torus Water Level Transmitter
LT-8123A	Torus Water Level Transmitter
MO2-14-05B	Core Spray Minimum Bypass Valve
MO2-14-07B	Core Spray Pump Suction Valve
AO-2511	Cont Atmos Control
AO-2512	Cont Atmos Control
AO-2513	Torus Exhaust Bypass
AO-2514	Torus Exhaust Bypass
SV2-20-82	Radwaste Cont Sump Drain
SV2-20-83	Radwaste Cont Sump Drain
SV2-20-94	Radwaste Cont Sump Drain
SV2-20-95	Radwaste Cont Sump Drain
SV-4950A	CAD Supply
SV-4950B	CAD Supply
SV-4951A	CAD Supply
SV-4951B	CAD Supply
SV-2980	Drywell Sample Return Isolation
TE-4937A	RCIC - Steam Leak Detection
TE-4937B	RCIC - Steam Leak Detection
TE-4937C	RCIC - Steam Leak Detection
TE-4937D	RCIC - Steam Leak Detection
TE-4938A	RCIC - Steam Leak Detection
TE-4938B	RCIC - Steam Leak Detection
TE-4938C	RCIC - Steam Leak Detection
TE-4938D	RCIC - Steam Leak Detection
TE-4939A	RCIC - Steam Leak Detection
TE-4939C	RCIC - Steam Leak Detection
TE-4939D	RCIC - Steam Leak Detection
TE-4942A	HPCI - Steam Leak Detection
TE-4942B	HPCI - Steam Leak Detection
TE-4942C	HPCI - Steam Leak Detection
TE-4942D	HPCI - Steam Leak Detection
TE-4943A	HPCI - Steam Leak Detection
TE-4943B	HPCI - Steam Leak Detection
TE-4943C	HPCI - Steam Leak Detection
TE-4943D	HPCI - Steam Leak Detection
DPIS2-14-810	Core Spray Min Flow
AO-2502A	Torus Vacuum Relief
AO-2968	CAC Inst N_2
DPIS-2503A	Cont Atmos Control
DPT2-02-116A	Steam Line Flow
DPT2-02-116B	Steam Line Flow
DPT2-02-116C	Steam Line Flow
DPT2-02-116D	Steam Line Flow
DPT2-02-117A	Steam Line Flow
DPT2-02-117B	Steam Line Flow
DPT2-02-117C	Steam Line Flow

DPT2-02-117D	Steam Line Flow
DPT2-02-118A	Steam Line Flow
DPT2-02-118B	Steam Line Flow
DPT2-02-118C	Steam Line Flow
DPT2-02-118D	Steam Line Flow
DPT2-02-119A	Steam Line Flow
DPT2-02-119B	Steam Line Flow
DPT2-02-119C	Steam Line Flow
DPT2-02-119D	Steam Line Flow
PS2-14-044B	Core Spray Auto Blowdown Interlock
PS2-14-044D	Core Spray Auto Blowdown Interlock
PS2-14-044A	Core Spray Auto Blowdown Interlock
PS2-14-044C	Core Spray Auto Blowdown Interlock
AO-2502B	Cont Atmos Control
DPIS2-12-124A	RWCU Break Isolation
DPIS2-12-124B	RWCU Break Isolation
DPIS-2503B	Cont Atoms Control
H_2E-4965C	CAD Analysis
H_2E-4965D	CAD Analysis
O_2E-4963C	CAD Analysis
O_2E-4963D	CAD Analysis
SV-4960C	CAD Analysis
SV-4960D	CAD Analysis
SV-4961C	CAD Analysis
SV-4961D	CAD Analysis
DPIS2-14-81C	Core Spray Min Flow
DPIS2-14-81A	Core Spray Min Flow
DPIS2-14-81B	Core Spray Min Flow
LS2-23-91A	HPCI Suppression Pool Level
LS2-23-91B	HPCI Suppression Pool Level

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Lube oil from the core spray pumps either leaking onto the floor with subsequent ignition of the oil or an overheating of the pumps causing ignition of the oil.

(3) Hydrogen and oxygen caused by leaks from cylinders in the vacuum breaker room with subsequent ignition of the gases.

(4) Since no combustible material is located in stairwell no. 18, the origin of a postulated fire in the area is indeterminate.

(5) Ignition of fire retardant impregnated wood scaffolding material located in the torus room storage container. (An unlikely occurrence because of the inherent fire protection properties associated with fire retardant material.)

(d) Consequence of Fire with Active Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 5 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method A for Unit 2 and shutdown methods A, B, and C for Unit 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method A for Unit 2 and shutdown methods A, B, and C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost. Suppression pool indication is considered available via physical separation between redundant components and cables located in this fire area.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 5, shutdown method A will be available to safely shut down Unit 2 and shutdown methods A, B, and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of dampers in two ducts through the north wall of the Unit 2,

B core spray pump room, (fire zone 5-5D) could jeopardize secondary containment capability in the event of a reactor building isolation. Combustible loading is low, and chance of transmission of smoke through the ducts is low.

(2) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C) for lack of suppression in the U2 torus area (room 1) elevation 91'-6" (fire area 5-5c). The basis for the exemption was physical separation between redundant components and low combustible loading.

(3) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and sections 5.3.5.(f)(3) and 5.3.6.(f)(3)) for three gratings located in the floor of the U2 reactor building on elevation 135'-0" which is adjacent to fire area 5. These gratings are located in fire area-zones 6S, 6S-20 (the neutron monitoring room) and in the CFZ in the west corridor between fire areas 6N and 6S. The basis for the exemption was low combustible loading and the fire protection features present.

(4) In a letter from the licensee to the NRC dated September 16, 1983 (see reference 25 in Appendix C) the licensee identified that detection would not be installed in stairwell 18 (fire area 5-7) in accordance with Appendix R, section III.F. In lieu of detection, a 3 hour rated barrier was installed to protect the safety related raceway in the area.

(5) An engineering evaluation has been performed to replace a 2 foot thick concrete hatch plug in the 3 hour rated floor slab between fire area-zone 5-5C and 6N-5H with hatch plug fabricated from structural steel and lightweight concrete. This evaluation is documented in Minor Physical Change (MPC) Engineering Change Request (ECR) PB 98-00382.

(6) An exemption from the requirements of Appendix R Section III.G.2 was granted in an SER from the NRC dated March 13, 1985 for post fire manual operation of valves for a fire in this area.

5.3.5 Fire Area 6N: Unit 2 - North CRD Equipment Area, North Isolation Valve Compartment, Drywell Access, Corridors (Elev. 135'-0")

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (part adjacent to fire area 4)	3-hr
	N - Reinforced concrete (part adjacent to fire area 9)	2-hr
	E - Reinforced concrete (part adjacent to fire area 50)	3-hr
	E - Reinforced concrete (part adjacent to fire area 9)	2-hr
	S - Reinforced concrete (part adjacent to fire area 17) (contains an 84 sq ft steel blowout panel, unrated)	3-hr
	S - Reinforced concrete (part adjacent to fire area 18)	none
	W - Reinforced concrete (part adjacent to fire area 17)	3-hr
	W - Reinforced concrete (exterior wall)	none
Floor:	Reinforced concrete(contains one 50 sq ft open grating in the CFZ between fire areas 6N and 6S in the west corridor which is adjacent to fire area 5, unrated) (One structural steel member adjacent to fire area 5 will be coated with structural steel fire proofing.)	3-hr
Ceiling:	Reinforced concrete (Nine structural steel members will be coated with structural steel fire proofing.)	3-hr
Access:	Door connecting to fire area 9 Two doors connecting to fire area 17 Corridors connecting to fire area 6S	

(b) Major Components in Fire Area

AO-4807 HPCI Steam Isolation Bypass

MO2-10-017	RHR Shutdown Cooling Suction Valve
MO2-10-025B	RHR Recirc Loop B Return Valve
MO2-10-026B	RHR Drywell Spray Isolation Valve
MO2-10-031B	RHR Drywell Spray Isolation Valve
MO2-14-011B	Outboard Core Spray Discharge Valve
MO2-14-012B	Inboard Core Spray Discharge Valve
MO2-23-016	Inboard HPCI Steam Supply Isolation Valve
2OD11	HPCI Motor Control Center
2OY32	Lighting Panel
MCC20B37	2B Motor Control Center
SV-8130A	Backup N_2 Supply
MO-2373	Recirc Pumps Cooling Water Isolation
MO-2374	Recirc Pumps Cooling Water Isolation
SV-4948B	CAD Supply
TE-4944A	HPCI Steam Leak Det
TE-4944B	HPCI Steam Leak Det
TE-4944C	HPCI Steam Leak Det
TE-4944D	HPCI Steam Leak Det
AO-2521A	CAD Purge
AO-2521B	CAD Purge
FT-8130A	Instrument Nitrogen
FT-8130B	Instrument Nitrogen
MO-2200A	Drywell Clr Inlet Isol
MO-2200B	Drywell Clr Inlet Isol
PT-8142A	Instrument Nitrogen
SV2-03-32B	Scram Disch Vol Vent Isol
SV2-03-35B	Scram Disch Vol Vent Isol
SV-4966A	CAD Analysis
SV-4966B	CAD Analysis
SV-4966C	CAD Analysis
SV-4966D	CAD Analysis
SV-8101	CAD Analysis

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Since there are no combustible materials located in the north isolation valve room and the drywell areas, the origin of a postulated fire is indeterminate.

(3) Wood with subsequent ignition from an external source (an unlikely occurrence because of the fire protection properties associated with fire retardant material).

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room. Heat from a fire in the west corridor will cause heat detectors to activate which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. When both heat detectors in the west corridor are activated, a deluge valve will open supplying water to the water curtain system's open sprinkler heads to extinguish the fire. Fire will be prevented from passing through the corridor and affecting fire area 6S.

(e) Effect of Fire on Safe Shutdown

Fire Area 6N contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method C for Unit 2 and shutdown methods A, B, and C for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method C for Unit 2 and shutdown methods A, B, and C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary bus may be affected by a fire in this area. Offsite power to the 4kV switchgear via the 00A020 emergency auxiliary bus is not affected by a fire in this area.

Therefore, for a fire in Fire Area 6N, shutdown method C will be available to safely shut down Unit 2 and shutdown methods A, B, and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure

of dampers in two ducts through the floor of the elevation 135 feet CRD area could jeopardize secondary containment capability in the event of a reactor building isolation. Combustible loading is low, and chance of transmission of smoke through the ducts is low.

(2) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for a heating and ventilating duct through a 3-hour fire barrier without a fire damper. The duct is through the floor of the elevation 135 feet CRD area and is a carbon steel pipe. Transmission of smoke through the hard-piped duct into the torus would be inconsequential.

(3) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.4.(f)(3)) for a grating located in the floor of the U2 reactor building on elevation 135'-0". This grating is located in the CFZ between fire areas 6N and 6S in the west corridor which is adjacent to fire area 5. The basis for the exemption was low combustible loading and the fire protection features present.

(4) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.6.(f)(4)) for the lack of automatic suppression throughout the area. The basis for the exemption is that Area 6N is separated from 6S by a CFZ on one side and an automatically actuated deluge water curtain and a CFZ on the other. Components and cables associated with redundant methods are separated from each other via the CFZ. Automatic detection is provided. An engineering analysis evaluates the CFZ with respect to the equipment credited for safe shutdown in Fire Areas 6S and 6N, demonstrating that the separation provided is equivalent to III.G.2 of 10CFR 50 Appendix R.

(5) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986 (see reference 18 in Appendix C and section 5.3.13.(f)(3)) for separation of cables and equipment and non-safety circuits of redundant trains by a fire barrier having a 3 hour rating. A steel blowout panel and labyrinth are provided for steam venting in

the event of a high energy line break between fire areas 6N and 17 and between fire areas 17 and 50. There are no fixed combustibles in fire area 17. Operation of affected equipment in the MSIV room occurs early in the safe shutdown scenario, and no spurious actuation in the room can affect valve positioning.

(6) An engineering evaluation has been performed to replace a 2 foot thick concrete hatch plug in the 3 hour rated floor slab between fire area-zone 5-5C and 6N-5H with hatch plug fabricated from structural steel and lightweight concrete. This evaluation is documented in Minor Physical Change (MPC) Engineering Change Request (ECR) PB 98-00382.

(7) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.6 Fire Area 6S: Unit 2 - South CRD Equipment Area,

Neutron Monitoring Room, South Isolation Valve Compartment CRD Equipment Room (Elev. 135'-0"); Cleanup Recirculation Pump Rooms, Regen Heat Exchanger Room, Non-Regen Heat Exchanger Room, Transfer Pump Room, Backwash Receiving Tank Room, Operating Area, Isolation Valve Compartment (Elev. 165'-0"); Stairwell No. 30 (Elev. 165'-0" to 180'-0"); Valve Compartments (Elev. 180'-0"); Reactor Building Ventilating Equipment Area, Prefilter and HEPA Filter Compartments, Laydown Area, Filter-Demineralizer Compartments, Holding Pump Compartments, Source Storage and Calibration (Elev. 195'-0"); Steam Separator and Steam Dryer Storage Pit (Elev. 209'-0"); Reactor Building Fan Room (Elev. 214'-0"); New Fuel Storage (Elev. 217'-0")" Washdown Area, laydown areas (Elev. 234'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (parts adjacent to fire areas 17, 25, and 27)	3-hr
	N - Reinforced concrete (part adjacent to fire area 9)	2-hr
	N - Reinforced concrete (part adjacent to fire area 18 and exterior wall	3-hr
	E - Reinforced concrete (part adjacent to fire area 50)	3-hr
	E - Reinforced concrete (part adjacent to fire area 9)	2-hr
	E - Reinforced concrete (part adjacent to fire area 50, elev. 195'-0", see 5.3.6(f)(2) for discussion about evaluation of the barrier)	3-hr
	E - Reinforced concrete (exterior wall, elev. 234'-0")	none
	S - Reinforced concrete (part adjacent to boilerhouse; only fire area 6S is adjacent to the boilerhouse)	none
	S - Reinforced concrete (part adjacent to liquid nitrogen storage building)	3-hr
	S - Reinforced concrete (part adjacent to fire area 1)	3-hr
	S - Reinforced concrete (exterior wall)	none
	W - Reinforced concrete (exterior wall)	none
	W - Reinforced concrete (part adjacent to fire area 1)	3-hr
Floor:	Reinforced concrete (contains two open gratings adjacent to fire area 5, 40 sq ft and 87 sq ft respectively, and a 50 sq ft open grating also adjacent to fire area 5 that is located in the CFZ between fire areas 6N and 6S in the west corridor, unrated) (Two structural steel members adjacent to fire area 5-5F will be coated with structural steel fire proofing. Nine structural steel members adjacent to fire area 6N will be coated with fire proofing.)	3-hr
	Reinforced concrete (area north of column line 12, elev. 165'-0")	3-hr
Ceiling:	Metal deck, nonreinforced concrete and	none

built-up roofing

Access: Doors connecting to fire areas 1 and 9
Corridors connecting to fire area 6N
Door connecting to fire area 18
Equipment access lock
Door connecting to fire area 50

(b) Major Components in Fire Area

MO2-10-025A	RHR Recirc Loop A Return Valve
MO2-10-026A	RHR Drywell Spray Isolation Valve
MO2-14-011A	Outboard Core Spray Discharge Valve
MO2-14-012A	Inboard Core Spray Discharge Valve
SV-8130B	Backup N_2 Supply Valve
2OY35	Distribution Panel
LT2-2-3-70	Reactor Water Level Transmitter
MCC20B38	2C Motor Control Center
MO2-12-018	RWCU Containment Isolation Valve
2OB10	2A Emergency Load Center
20B11	2B Emergency Load Center
2OV12	2C Emergency Load Center
2OB13	2D Emergency Load Center
LT2-2-3-110A	Reactor Water Level Transmitter
LT2-2-3-110B	Reactor Water Level Transmitter
LT2-2-3-61	Reactor Water Level Transmitter
LT2-2-3-72A	Reactor Water Level Transmitter
LT2-2-3-72B	Reactor Water Level Transmitter
LT2-2-3-72C	Reactor Water Level Transmitter
LT2-2-3-72D	Reactor Water Level Transmitter
MCC20B36	2A Motor Control Center
MO2-10-031A	RHR Drywell Spray Isolation Valve
MO2-12-056	RWCU To Condenser Hot Well
MO2-12-057	RWCU To Condenser Hot Well
PR-8102A	Drywell Pressure Transmitter
PT-8102B	Drywell Pressure Transmitter
PT-8102C	Drywell Pressure Transmitter
PT-8102D	Drywell Pressure Transmitter
PT2-2-3-404A	Reactor Pressure Transmitter
PT2-2-3-404B	Reactor Pressure Transmitter
PT2-6-105	Reactor Pressure Transmitter
PT2-6-53A	Reactor Pressure Transmitter
PT2-6-53B	Reactor Pressure Transmitter
CV2-12-55	RWCU Pump Suction Flow Control Valve
MO2-12-053	RWCU To Condenser Hot Well
PT-2508A	Drywell Pressure Transmitter
PT-2508B	Drywell Pressure Transmitter

AO-2505	Drywell Vent Isolation Valve
AO-2520	Containment Atmos Control
SV-4948A	CAD Supply
AO-2519	Cont N_2 Purge
AO-2523	Containment Atmos Control
AO-2969A	Inst N_2 Isolation
PT-2-02-3-52D	Core Spray/RHR Pressure Permissive
N210025A	Motor Control Center
DPIS-2-02-116A	Steam Line Flow
DPIS-2-02-116B	Steam Line Flow
DPIS-2-02-116C	Steam Line Flow
DPIS-2-02-116D	Steam Line Flow
DPIS-2-02-117A	Steam Line Flow
DPIS-2-02-117B	Steam Line Flow
DPIS-2-02-117C	Steam Line Flow
DPIS-2-02-117D	Steam Line Flow
DPIS-2-02-118A	Steam Line Flow
DPIS-2-02-118B	Steam Line Flow
DPIS-2-02-118C	Steam Line Flow
DPIS-2-02-118D	Steam Line Flow
DPIS-2-02-119A	Steam Line Flow
DPIS-2-02-119B	Steam Line Flow
DPIS-2-02-119C	Steam Line Flow
DPIS-2-02-119D	Steam Line Flow
LT2-02-3-083A	Reactor Water Level Transmitter
LT2-02-3-083B	Reactor Water Level Transmitter
LT2-02-3-099A	Reactor Water Level Transmitter
LT2-02-3-099B	Reactor Water Level Transmitter
LT2-02-3-099C	Reactor Water Level Transmitter
LT2-02-3-099D	Reactor Water Level Transmitter
LT2-02-3-101A	Reactor Water Level Transmitter
LT2-02-3-101B	Reactor Water Level Transmitter
LT2-02-3-101C	Reactor Water Level Transmitter
LT2-02-3-101D	Reactor Water Level Transmitter
LT2-02-3-111A	Reactor Shroud Level Transmitter
LT2-02-3-111B	Reactor Shroud Level Transmitter
PT-2-02-3-404A	Reactor Pressure
PT-2-02-3-404B	Reactor Pressure
PT2-02-3-55A	Reactor Prot System
PT2-02-3-55B	Reactor Prot System
PT2-02-3-55C	Reactor Prot System
PT2-02-3-55D	Reactor Prot System
PT2-05-12A	Drywell Pressure Transmitter
PT2-05-12B	Drywell Pressure Transmitter
PT2-05-12C	Drywell Pressure Transmitter
PT2-05-12D	Drywell Pressure Transmitter
PT2-10-100A	Drywell Pressure Transmitter

PT2-10-100B	Drywell Pressure Transmitter
PT2-10-100C	Drywell Pressure Transmitter
PT2-10-100D	Drywell Pressure Transmitter
SV-20465	SGTS Containment Isolation
SV-4949A	Cont Atmos Control
AO-2506	Cont Atmos Control
AO-2507	Cont Atmos Control
AO-2509	Cont Atmos Control
AO-2510	Cont Atmos Control
AO-4235	Inst N_2 Isol Valve
E/P-4957	CAD Purge and Vent
FIT-4957	CAD Purge and Vent
H_2E-4965B	CAD Analysis
O_2E-4965B	CAD Analysis
RE2-17-432A	Reactor Building Vent Rad Monitor
RE2-17-432B	Reactor Building Vent Rad Monitor
RE2-17-432C	Reactor Building Vent Rad Monitor
RE2-17-432D	Reactor Building Vent Rad Monitor
SV-4960B	CAD Isol Valve
SV-4961B	CAD Isol Valve
SV-8100	CAD Analysis

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) A boronated shield door in front of the access opening to the drywell with subsequent ignition from an outside source.

(3) Ignition of combustibles in the South Isolation Valve Room.

(4) Since there are no combustible materials located in the drywell areas, the origin of a postulated fire is indeterminate.

(5) Since the combustible materials located in the neutron monitoring room result in only few seconds of fire severity change the origin of a postulated fire is indeterminate.

(6) Since there are no combustibles in the heat exchanger rooms, pump rooms, and valve compartments, the origin of a postulated fire is indeterminate.

(7) Wood and paper with subsequent ignition from external sources.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room. Heat from a fire in the west corridor will cause heat detectors to activate which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. Upon receipt of the alarm in the control room, the plant fire brigade will be dispatched to extinguish the fire. When both heat detectors in the west corridor are activated, a deluge valve will open supplying water to the water curtain system's open sprinkler heads to extinguish the fire. Fire will be prevented from passing through the corridor and affecting fire area 6N.

(e) Effect of Fire on Safe Shutdown

Fire Area 6S contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method B for Unit 2 and shutdown methods A, B, and C for Unit 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method B for Unit 2 and shutdown methods A, B, and C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary bus may be affected by a fire in this area. Offsite power to the 4kV switchgear via the 00A020 emergency auxiliary bus is not affected by a fire in this area.

Therefore, for a fire in Fire Area 6S, shutdown method B will be available to safely shut down Unit 2 and shutdown methods A, B, and C will be available to safely shut down Unit 3.

A postulated fire in the vicinity of the reactor vessel instrumentation reference leg backfill system could adversely affect reactor vessel water level indication due to reference leg density changes caused by an increase in water temperature. Since there are no fire initiators in close proximity to the backfill system tubing, administratively controlled transient combustible free zones throughout the locations of the backfill system on elevations 135 feet and 165 feet in the reactor building will preclude any adverse effect on level indication, due to fire, prior to annunciation in the main control room. Following annunciation in the main control room the backfill system will be administratively isolated from the reference legs.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of dampers in two ducts through the floor of elevation 165 feet operating area could jeopardize secondary containment capability in the event of a reactor building isolation. Combustible loading is low, and chance of transmission of smoke through the ducts is low.

(2) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986 (see reference 18 in Appendix C and section 5.3.40 (f)(3)), to provide fixed suppression. The exemption credits the substantial barrier provided by the wall and the distance between credited components on either side. Subsequently, the barrier was evaluated and determined to be adequate for the fire hazard.

(3) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.4.(f)(3)) for three gratings located in the floor of the U2 reactor building on elevation 135'-0" which is adjacent to fire area 5. These gratings are located in fire area-zones 6S, 6S-20 (the neutron monitoring room) and in the CFZ in the west corridor between fire areas 6N and 6S. The basis for the exemption was low combustible loading and the fire protection features present.

(4) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.5.(f)(4)) for the lack of automatic suppression throughout the area. The basis for the exemption is that Area 6N is separated from 6S by a CFZ on one side and an automatically actuated deluge water curtain and a CFZ on the other. Components and cables associated with redundant methods are separated from each other via the CFZ. Automatic detection is provided. An engineering analysis evaluates the CFZ with respect to the equipment credited for safe shutdown in Fire Areas 6S and 6N, demonstrating that the separation provided is equivalent to III.G.2 of 10CFR 50 Appendix R.

(5) An exemption from the requirements of Appendix R, Section III.F, was granted in an SER from the NRC dated August 18, 2000, for the lack of fire detection in fire zones 6S-5M and 6S-42. The bases for the approval of the exemption in these two zones is minimal access to the rooms (since they are locked high radiation areas), low combustible loading, and the location of redundant shutdown features (to those located in these zones) outside the fire zone.

(6) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

(7) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.7 Fire Area 9: Units 2 - Stairwell No. 19, Elevator Shaft (Elev. 91'-0" to 251'-8"); Elevator Machine Room (Elev. 251'-8")

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (parts adjacent to fire areas 2, 4, and 25; exterior wall, elev. 195'-0")	3-hr
	N - Reinforced concrete (exterior wall	2-hr
	E - Reinforced concrete (part adjacent to fire area 50)	3-hr
	E - Reinforced concrete (exterior wall, elev. 234'-0")	2-hr
	S - Reinforced concrete	2-hr
	W - Reinforced concrete	2-hr
Floor:	Reinforced concrete foundation mat	none
	Reinforced concrete (elevator machine room)	3-hr
Ceiling:	Metal deck, nonreinforced concrete and built-up roofing	3-hr
Access:	Doors connecting to fire areas 5, 6N, 6S, and 25	

(b) Major Components in Fire Area

None.

(c) Postulated Fire in Area

Since there are no combustibles present, the origin of a postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

Upon notification of a fire, the plant fire brigade will be dispatched to extinguish the fire.

(e) Effect of Fire on Safe Shutdown

Fire Area 9 does not contain safe shutdown cables or equipment.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 9, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of dampers in two ducts through the south wall elevation 91'-6" could jeopardize secondary containment capability in the event of a reactor building isolation.

Combustible loading is low, and chance of transmission of smoke through the ducts is low.

5.3.8 Fire Area 10: Unit 3 - B and D RHR Heat Exchanger and Pump Rooms (Elev. 91'-6" and 116'-0"); Stairwell No. 27 (Elev. 135'-0" to 234'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (exterior wall to elev. 135'-0")	none
	N - Reinforced concrete (exterior wall elev. 135'-0" and above)	2-hr
	E - Reinforced concrete (part adjacent to fire area 12)	3-hr
	E - Reinforced concrete (part adjacent to fire area 13N)	3-hr
	SE - Reinforced concrete	3-hr
	S - Reinforced concrete	3-hr

	W - Reinforced concrete (exterior wall to elev. 135'-0")	none
	W - Reinforced concrete (exterior wall elev. 135'-0" and above)	2-hr
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Reinforced concrete (RHR room B)	3-hr
	Reinforced concrete	none
	Metal deck, nonreinforced concrete and built-up roofing	none
Access:	Doors connecting to stairwell no. 27	
	Door connecting to fire area 12	

(b) Major Components in Fire Area

3BE24	RHR Heat Exchanger
3EV25	RHR Pump Room Cooling Fan
3FV25	RHR Pump Room Cooling Fan
MO3-10-015B	RHR Shutdown Cooling Suction Valve
MO3-10-89B	RHR HX Discharge Valve
3DE24	RHR Heat Exchanger
3GE58	RHR Pump Room Cooler HX
3GV25	RHR Pump Room Cooling Fan
3HV25	RHR Pump Room Cooling Fan
AO-3335G	RHR Pump Room Cooler HX Valve
DPT3-10-179	RHR/HPSW Differential Pressure Transmitter
FT3-10-109B	RHR Flow Transmitter
FT3-10-178	RHR Loop B Flow Transmitter
MO3-10-89D	RHR HX Discharge Valve
3BE124	RHR Pump Seal Water Cooler HX
3BP35	RHR Pump B
LT-9123B	Torus Water Level Transmitter
LT-9456	Suppression Pool Water Level Transmitter
MO3-10-013B	LPCI Suction Isolation Valve
MO3-10-016B	RHR Pump Discharge Bypass
3DE124	RHR Pump Seal Water Cooler HX
3DP35	RHR Pump D
MO3-10-013D	LPSI Suction Isolation Valve
MO3-10-015D	RHR Shutdown Cooling Suction Valve
ML3-10-016D	RHR Pump Discharge Bypass
AO-9098B	RHR Sample Line Isolation Valve
AO-9099B	RHR Sample Line Isolation Valve
AO-9098D	RHR Sample Line Isolation Valve
AO-9099D	RHR Sample Line Isolation Valve
PS3-10-120B	RHR Auto Blowdown Interlock

PS3-10-120D	RHR Auto Blowdown Interlock
DPIS3-10-121D	RHR Pump D Recirc Flow
CV-3-10-3677B	RHR B Flow Control Valve
CV-3-10-3677D	RHR D Flow Control Valve
MO3-10-33452B	RHR B/D Cross-Tie Isolation Valve

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Lube oil from the RHR pump either leaking onto the floor with subsequent ignition of the oil or an overheating of the pumps causing ignition of the oil.

(3) Since there are no combustible materials located in stairwell no. 27, the origin of a postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 10 contains safe shutdown cables and equipment.

Cables located in this area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown methods A and C for Unit 3 are associated with equipment that has redundant components not affected by a fire in this area. Equipment located in this area that is associated with shutdown methods A, B, and C for Unit 2 and shutdown methods A and C for Unit 3 has redundant components not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 10, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown methods A and C will be available to safely shut down Unit 3.

5.3.9 Fire Area 12: Unit 3 - A, B, and C Core Spray Pump Rooms (Elev. 91'-6"); Torus Area (Elev. 92'-6"); Stairwell No. 23 (Elev. 91'-6" to 116'-0")

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (exterior wall)	none
	E - Reinforced concrete (part adjacent to fire area 50)	3-hr
	E - Reinforced concrete (part adjacent to fire area 16)	2-hr
	S - Reinforced concrete (part adjacent to fire area 2)	3-hr
	S - Reinforced concrete (part adjacent to fire area 16)	2-hr
	SW - Reinforced concrete	3-hr
	W - Reinforced concrete (exterior wall	none
	NW - Reinforced concrete	3-hr
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Reinforced concrete, exterior boundary	none
	Reinforced concrete(contains two open gratings adjacent to fire area 13S, 40 sq ft and 87 sq ft respectively, and a 50 sq ft open grating adjacent to the CFZ between fire areas 13N and 13S in the west corridor, unrated) (One structural steel member in fire zone 12-13G adjacent to fire area 13S and two structural steel members in fire zone 12-13F adjacent to fire area 13N will be coated with structural steel fire proofing.)	3-hr
Access:	Door connecting to fire area 16	
	Door connecting to fire area 10	
	Two doors connecting to fire area 2	
	Two doors connecting to fire area 50	

(b) Major Components in Fire Area

FT3-14-40B Core Spray Flow Transmitter

LT-9453	CST Level Transmitter
FT3-14-40A	Core Spray Flow Transmitter
PT-7466	ESW Pressure Transmitter
MO-5244	Vacuum Breaker Valves
MO-5244A	Vacuum Breaker Valves
MO3-10-034A	RHR Supply To Torus
MO3-10-034B	RHR Supply To Torus
MO3-10-039A	RHR Supply To Torus
MO3-10-039B	RHR Supply To Torus
MO3-10-154A	RHR Recirc Loop A Return Valve
MO3-10-154B	RHR Recirc Loop B Return Valve
MO3-13-030	RCIC Test Bypass To CST
MO3-14-026A	Core Spray Test Bypass Valve
MO3-14-026B	Core Spray Test Bypass Valve
MO3-23-021	HPCI Test Bypass To CST
MO3-23-024	HPCI Redundant Test Bypass To CST
MO3-23-031	HPCI Flush Line Shutoff To Torus
TE-3-2-71A1	Torus Temperature Element
TE-3-2-71A2	Torus Temperature Element
TE-3-2-71B1	Torus Temperature Element
TE-3-2-71B2	Torus Temperature Element
TE-3-2-71C1	Torus Temperature Element
TE-3-2-71C2	Torus Temperature Element

TE-3-2-71D1	Torus Temperature Element
TE-3-2-71D2	Torus Temperature Element
TE-3-2-71E1	Torus Temperature Element
TE-3-2-71E2	Torus Temperature Element
TE-3-2-71F1	Torus Temperature Element
TE-3-2-71F2	Torus Temperature Element
TE-3-2-71G1	Torus Temperature Element
TE-3-2-71G2	Torus Temperature Element
TE-3-2-71H1	Torus Temperature Element
TE-3-2-71H2	Torus Temperature Element
TE-3-2-71J1	Torus Temperature Element
TE-3-2-71J2	Torus Temperature Element
TE-3-2-71K1	Torus Temperature Element
TE-3-2-71K2	Torus Temperature Element
TE-3-2-71L1	Torus Temperature Element
TE-3-2-71L2	Torus Temperature Element
TE-3-2-71M1	Torus Temperature Element
TE-3-2-71M2	Torus Temperature Element
TE-3-2-71N1	Torus Temperature Element
TE-3-2-71N2	Torus Temperature Element
TE-3442A	Torus Temperature Element
TE-3442B	Torus Temperature Element
TE-9457	Suppression Pool Temperature Element
3DE133	Core Spray Pump Motor Oil Cooler HX

3DP37	Core Spray Pump
3GE57	Core Spray Pump Room Cooler HX
3GV-24	Core Spray Pump Room Cooling Fan
3HE57	Core Spray Pump Room Cooler HX
3HV-24	Core Spray Pump Room Cooling Fan
AO-3336G	Core Spray Pump Room Cooler HX Valve
AO-3336H	Core Spray Pump Room Cooler HX Valve
MO3-14-05D	Minimum Bypass Valve
MO3-14-07D	Core Spray Pump Suction Valve
3BE133	Core Spray Pump Motor Oil Cooler HX
3BP37	Core Spray Pump
3EE57	Core Spray Pump Room Cooler HX
3EV-24	Core Spray Pump Room Cooling Fan
3FE57	Core Spray Pump Room Cooler HX
3FV-24	Core Spray Pump Room Cooling Fan
AO-3336E	Core Spray Pump Room Cooler HX Valve
AO-3336F	Core Spray Pump Room Cooler HX Valve
MO3-14-05B	Core Spray Minimum Bypass Valve
MO3-14-07B	Core Spray Pump Suction Valve
3CE133	Core Spray Pump Motor Oil Cooler HX
3CE57	Core Spray Pump Room Cooler HX
3CP37	Core Spray Pump
3CV-24	Core Spray Pump Room Cooling Fan

3DE57	Core Spray Pump Room Cooler HX
3DV-24	Core Spray Pump Room Cooling Fan
AO-3336C	Core Spray Pump Room Cooler HX Valve
AO-3336D	Core Spray Pump Room Cooler HX Valve
LT-9027A	Torus Water Level Transmitter
LT-9027B	Torus Water Level Transmitter
LT-9123A	Torus Water Level Transmitter
MO3-14-05C	Core Spray Minimum Bypass Valve
MO3-14-07C	Core Spray Pump Suction Valve
MO-3200B	Drywell Cooling
3AE133	Core Spray Pump Motor Oil Cooler HX
3AE57	Core Spray Pump Room Cooler HX
3AP37	Core Spray Pump
3AV24	Core Spray Pump Room Cooling Fan
3BE57	Core Spray Pump Room Cooler HX
3BV24	Core Spray Pump Room Cooling Fan
AO-3336A	Core Spray Pump Room Cooler HX Valve
AO-3336B	Core Spray Pump Room Cooler HX Valve
MO3-14-05A	Core Spray Minimum Bypass Valve
MO3-14-07A	Core Spray Pump Suction Valve
AO-3502B	Cont Atmos Control
DPIS-3503B	Cont Atmos Control
DPT-3-02-116A	Steam Line Flow
DPT-3-02-116B	Steam Line Flow

DTP-3-02-116C	Steam Line Flow
DPT-3-02-116D	Steam Line Flow
DPT-3-02-117A	Steam Line Flow
DPT-3-02-117B	Steam Line Flow
DPT-3-02-117C	Steam Line Flow
DTP-3-02-117D	Steam Line Flow
DPT-3-02-118A	Steam Line Flow
DPT-3-02-118B	Steam Line Flow
DPT-3-02-118C	Steam Line Flow
DPT-3-02-118D	Steam Line Flow
DPT-3-02-119A	Steam Line Flow
DTP-3-02-119B	Steam Line Flow
DPT-3-02-119C	Steam Line Flow
DPT-3-02-119D	Steam Line Flow
H_2E-5965C	CAD Analysis
H_2E-5965D	CAD Analysis
O_2E-5963C	CAC Analysis
O_2E-5963D	CAC Analysis
PS3-14-044A	Core Spray Auto Blowdown Interlock
PS3-14-044C	Core Spray Auto Blowdown Interlock
PS3-14-044B	Core Spray Auto Blowdown Interlock
PS3-14-044D	Core Spray Auto Blowdown Interlock
SV-5960C	CAD Analysis

SV-5960D	CAD Analysis
SV-5961C	CAD Analysis
SV-5961D	CAD Analysis
DPIS3-12-124A	RWCU Break Isolation
DPIS3-12-124B	RWCU Break Isolation
DPIS-3503A	Cont Atmos Control
AO-3511	Cont Atmos Control
AO-3512	Cont Atmos Control
AO-3513	Cont Atmos Control
AO-3514	Cont Atmos Control
AO-3968	CAC Inst N_2
MO3-10-038A	RHR Torus Cooling
MO3-10-038B	RHR Torus Cooling
SV3-20-82	Radwaste Cont Sump Drain
SV3-20-83	Radwaste Cont Sump Drain
SV3-20-94	Radwaste Cont Sump Drain
SV3-20-95	Radwaste Cont Sump Drain
SV-5950A	CAD Analysis
SV-5950B	CAD Analysis
SV-5951A	CAD Analysis
SV-5951B	CAD Analysis
TE-5937A	RCIC Steam Leak Detection
TE-5937B	RCIC Steam Leak Detection
TE-5937C	RCIC Steam Leak Detection

TE-5937D	RCIC Steam Leak Detection
TE-5938A	RCIC Steam Leak Detection
TE-5938B	RCIC Steam Leak Detection
TE-5938C	RCIC Steam Leak Detection
TE-5938D	RCIC Steam Leak Detection
TE-5939A	RCIC Steam Leak Detection
TE-5939B	RCIC Steam Leak Detection
TE-5939C	RCIC Steam Leak Detection
TE-5939D	RCIC Steam Leak Detection
TE-5942A	HPCI Steam Leak Detection
TE-5942B	HPCI Steam Leak Detection
TE-5942C	HPCI Steam Leak Detection
TE-5942D	HPCI Steam Leak Detection
TE-5943A	HPCI Steam Leak Detection
TE-5943B	HPCI Steam Leak Detection
TE-5943C	HPCI Steam Leak Detection
TE-5943D	HPCI Steam Leak Detection
DPIS3-14-81D	Core Spray Minimum Flow
DPIS3-14-81B	Core Spray Minimum Flow
DPIS3-14-81C	Core Spray Minimum Flow
DPIS3-14-81A	Core Spray Minimum Flow

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Lube oil from core spray pumps either leaking onto the floor with subsequent ignition of the oil or an overheating of the pumps causing ignition of the oil.

(3) Since no combustible material is located in stairwell no. 23, the origin of a postulated fire in the area is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 12 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown method A for Unit 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Unit 2 and shutdown method A for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost. Suppression pool indication is considered available via physical separation between redundant components and cables located in this fire area.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 12, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown method A will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C) for lack of suppression in the U3 torus area (room 37) elevation 91'-6" (fire area 12-13C). The basis for the exemption was physical separation between redundant safe shutdown components and cables and low combustible loading.

(2) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and sections 5.3.10.(f)(5) and 5.3.11.(f)(2)) for three gratings located in the floor of the U3 reactor building on elevation 135'-0" which is adjacent to fire area 12. These gratings are located in fire area-zones 13S, 13S-20 (the neutron monitoring room) and in the CFZ in the west corridor between fire area-zones 13N and 13S. The basis for the exemption was low combustible loading and the fire protection features present.

(3) An engineering evaluation has been performed to allow replacement of a 2 foot thick concrete hatch plug with a hatch plug fabricated from structural steel and lightweight concrete (see reference 23 in Appendix C). The new hatch plug provides separation commensurate with the hazards in the area.

(4) An exemption from the requirements of Appendix R Section III.G.2 was granted in an SER from the NRC dated March 13, 1985 for post fire manual operation of valves for a fire in this area.

5.3.10 Fire Area 13N: Unit 3 - North CRD Equipment Area, Drywell Access, North Isolation Valve Compartment (Elev. 135'-0"); Operating Area, Backwash Receiving Tank, Non-Regen Heat Exchanger Room, Regen Heat Exchanger Room, Cleanup Recirculation Pump Room, Isolation Valve Compartment, Transfer Pump Room (Elev. 165'-0")' Stairwell No. 31 (Elev. 165'-0" to 180'-0"); Valve Compartment (Elev. 180'-0"); Reactor Building Ventilating Equipment Area, Prefilter and HEPA Filter Compartments, Holding Pump Compartments, Source Storage and Calibration (elev. 195'-0"); Steam Separator and Steam Dryer Storage Pit (Elev. 209'-0"); Reactor Building Fan Room (Elev. 214'-0"); New Fuel Storage (Elev. 217'-0"); Washdown Area (Elev. 234'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete (part adjacent to fire area 10)	3-hr
	N	- Reinforced concrete (part adjacent to recombiner building; only fire area 13N is adjacent to the recombiner building)	2-hr
	N	- Reinforced concrete (exterior wall above elev. 176'-0")	none
	E	- Reinforced concrete (part adjacent to fire area 50)	3-hr
	E	- Reinforced concrete (part adjacent to fire area 16)	2-hr
	E	- Reinforced concrete (part adjacent to fire area 50, elev. 195'-0")	3-hr
	E	- Reinforced concrete (exterior wall, elev. 234'-0")	none
	S	- Reinforced concrete (part adjacent to fire area 16)	2-hr
	S	- Reinforced concrete (parts adjacent to fire areas 20, 25, and 26) (part adjacent to fire area 20 contains an 84 sq ft steel blowout panel, unrated)	3-hr
	S	- Reinforced concrete (part adjacent to fire area 21 and exterior wall)	none
	W	- Reinforced concrete (exterior wall	none
	W	- Reinforced concrete (part adjacent to fire area 10)	3-hr
Floor:		Reinforced concrete (elev. 135'-0") (contains one 50 sq ft open grating in the CFZ between fire areas 13N and 13S in the west corridor which is adjacent to fire area 12, unrated) (Two structural steel members adjacent to fire zone 12-13F will be coated with structural steel fire proofing.)	3-hr
		Reinforced concrete (area south of column line 29, elev. 165'-0"	3-hr
Ceiling:		Metal deck, nonreinforced concrete	none

and built-up roofing

Access: Doors connecting to fire areas 10 and 16
Equipment access lock
Two doors connecting to fire area 20
Door connecting to fire area 50

(b) Major Components in Fire Area

MO2-10-017	RHR Shutdown Cooling Suction Valve
MO3-10-025B	RHR Recirc Loop B Return Valve
MO3-10-026B	RHR Drywell Spray
MO3-14-011B	Outboard Core Spray Discharge Valve
MO3-14-012B	Inboard Core Spray Discharge Valve
MO3-23-016	Outboard HPCI Steam Supply Isolation Valve
SV-9130A	Backup N_2 Supply Valve
30D11	HPCI Motor Control Center
MCC30B37	3B Motor Control Center
MCC30B39	3B Motor Control Center
MCC30B80	3B/D Motor Control Center
MCC30B82	3D/B Motor Control Center
30B10	3A Emergency Load Center
30B11	3B Emergency Load Center
30B12	3C Emergency Load Center
30B13	3D Emergency Load Center
LT3-2-3-110A	Reactor Water Level Transmitter
LT3-2-3-61	Reactor Water Level Transmitter
LT3-2-3-72A	Reactor Water Level Transmitter

MO3-12-056	RWCU To Condenser Hot Well
MO3-12-68	RWCU to RCIC (Feedwater)
MO3-12-057	RWCU to Condenser Hot Well
PT-9102A	Drywell Pressure Transmitter
PT-9102C	Drywell Pressure Transmitter
PT3-2-3-404A	Reactor Pressure Transmitter
PT3-6-53A	Reactor Pressure Transmitter
MO3-10-031B	RHR Drywell Spray
MO3-12-018	RWCU Containment Isolation Valve
CV3-12-55	RWCU Pump Suction Flow Control Valve
MO3-12-053	RWCU to Condenser Hot Well
PT-3508A	Drywell Pressure Transmitter
PT-3508B	Drywell Pressure Transmitter
TE-5944A	HPCI Steam Leak Det
TE-5944B	HPCI Steam Leak Det
TE-5944C	HPCI Steam Leak Det
TE-5944D	HPCI Steam Leak Det
AO-3505	Cont Atmos Control
AO-3969A	Inst N_2 Isolation
FT-9130A	Inst N_2 Flow
FT-9130B	Inst N_2 Flow
LT3-02-3-73A	Reactor Shroud Level Transmitter
MO-3200A	Drywell Cooling
MO-3200B	Drywell Cooling

MO-3201A	Drywell Cooling
MO-3201B	Drywell Cooling
PT3-02-3-052C	Core Spray/RHR Pressure Permissive
PT-9142A	Inst N_2
PT-9142B	Inst N_2
SV3-03-32B	CRD Drain and Isolation
SV3-03-35B	CRD Drain and Isolation
SV-5966A	CAD
SV-5966B	CAD
SV-5966C	CAD
SV-5966D	CAD
SV-9101	CAD
N310025B	Motor Control Center
DPIS3-02-116A	Steam Line Flow
DPIS3-02-116B	Steam Line Flow
DPIS3-02-117A	Steam Line Flow
DPIS3-02-117B	Steam Line Flow
DPIS3-02-118A	Steam Line Flow
DPIS3-02-118B	Steam Line Flow
DPIS3-02-119A	Steam Line Flow
DPIS3-02-119B	Steam Line Flow
LIS3-02-3-057A	Main Steam and Feedwater
LIS3-02-3-057B	Main Steam and Feedwater

LT3-02-3-072A	Reactor Level Transmitter
LT3-02-3-072B	Reactor Level Transmitter
LT3-02-3-072C	Reactor Level Transmitter
LT3-02-3-072D	Reactor Level Transmitter
LT3-02-3-099A	Reactor Level Transmitter
LT3-02-3-099B	Reactor Level Transmitter
LT3-02-03-101A	Reactor Level Transmitter
LT3-02-3-101B	Reactor Level Transmitter
PT3-02-3-052A	Core Spray/RHR Pressure Permissive
PT3-02-3-052B	Core Spray/RHR Pressure Permissive
PT3-02-3-404A	Reactor Pressure Transmitter
PT3-02-3-55A	Reactor Pressure Transmitter
PT3-05-12A	Drywell Pressure Transmitter
PT3-05-12B	Drywell Pressure Transmitter
PT3-10-100A	Drywell Pressure Transmitter
PT3-10-100B	Drywell Pressure Transmitter
PT3-10-100C	Drywell Pressure Transmitter
PT3-10-100D	Drywell Pressure Transmitter
SV-30465	SGTS Containment Isolation
MO3-10-033	RHR Head Cooling
SV-5948A	CAD Supply
SV-5949A	CAD Supply
AO-3506	Cont Atmos Control
AO-3507	Cont Atmos Control

AO-3509	Cont Atmos Control
AO-3510	Cont Atmos Control
AO-5235	Inst N Supply
E/P-5957	CAD Analysis
FIT-5957	CAD Analysis
RE3-17-432A	Reactor Building Vent Rad Monitor
RE3-17-432B	Reactor Building Vent Rad Monitor
RE3-17-432C	Reactor Building Vent Rad Monitor
RE3-17-432D	Reactor Building Vent Rad Monitor
SV-5960B	CAD Analysis
SV-5961B	CAD Analysis
SV-9100	CAD Analysis
SV-3671G	CAD Analysis

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Since there are no combustible materials located in the north isolation valve room and the drywell access, the origin of a postulated fire is indeterminate.

(3) Since there are no combustibles in the heat exchanger rooms, pump rooms, and valve compartments, the origin of a postulated fire is indeterminate.

(4) Wood and paper with subsequent ignition from an external source.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 13N contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown method A for Unit 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Unit 2 and shutdown method A for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 13N, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown method A will be available to safely shut down Unit 3.

A postulated fire in the vicinity of the reactor vessel instrumentation reference leg backfill system could adversely affect reactor vessel water level indication due to reference leg density changes caused by an increase in water temperature. Since there are no fire initiators in close proximity to the backfill system tubing, administratively controlled transient combustible free zones throughout the locations of the backfill system on elevations 135 feet and 165 feet in the reactor building will preclude any adverse effect on level indication, due to fire, prior to annunciation in the main control room. Following annunciation in the main control room the backfill system will be administratively isolated from the reference legs.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for

standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of dampers in two ducts through the floor of elevation 165 feet operating area could jeopardize secondary containment capability in the event of a reactor building isolation. Combustible loading is low, and chance of transmission of smoke through the ducts is low.

(2) An exemption from the requirements of Appendix R Section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.11.(f)(3)) for the lack of automatic suppression throughout the area. The basis for the exemption is that Area 13N is separated from 13S by a CFZ on one side and an automatically actuated deluge water curtain and a CFZ on the other. Redundant safe shutdown components and cables are separated from each other via the CFZ. Automatic detection is provided. An engineering analysis evaluates the CFZ with respect to the equipment credited for safe shutdown in Fire Areas 13S and 13N, demonstrating that the separation is equivalent to III.G.2 of 10CFR 50 Appendix R.

(3) An engineering evaluation has been performed to allow replacement of a 2 foot thick concrete hatch plug between fire area-zones 12-13F and 13N-13H with a hatch plug fabricated from structural steel and lightweight concrete (see reference 23 in Appendix C). The new hatch plug provides separation commensurate with the hazards in the area.

(4) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986 (see reference 18 in Appendix C and section 5.3.16.(f)(3)) for separation of cables and equipment and non-safety circuits of redundant trains by a fire barrier having a 3 hour rating. A steel blowout panel and labyrinth are provided for steam venting in the event of a high energy line break between fire areas 13N and 20 and between fire areas 20 and 50. There are no fixed combustibles in fire area 20. Operation of affected equipment in the MSIV room (room 254) occurs early in the safe shutdown scenario, and credited valves will not spuriously actuate.

(5) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March

13, 1985 (see reference 19 in Appendix C and section 5.3.9.(f)(2)) for a grating located in the floor of the U3 reactor building on elevation 135'-0". This grating is located in the CFZ between fire areas 13N and 13S in the west corridor which is adjacent to fire area 12. The basis for the exemption was low combustible loading and the fire protection features present.

(6) An exemption from the requirements of Appendix R, Section III.F was granted in an SER from the NRC, dated August 18, 2000, for the lack of fire detection in fire zones 13N-13M and 13N-36. The bases for the approval of the exemption in these two zones is minimal access to the rooms (since they are locked high radiation areas), low combustible loading, and the location of redundant shutdown features (to those located in these zones) outside the fire zone.

(7) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

(8) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.11 Fire Area 13S: Unit 3 - South CRD Equipment Area, South Isolation Valve Compartment, Neutron Monitoring Room, Corridors (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete (part adjacent to fire area 21)	none
	N	- Reinforced concrete (part	3-hr

	adjacent to fire area 20)	
E	- Reinforced concrete (part adjacent to fire area 50)	3-hr
E	- Reinforced concrete (part adjacent to fire area 16)	2-hr
S	- Reinforced concrete (part adjacent to fire area 16)	2-hr
S	- Reinforced concrete (parts adjacent to fire areas 2 and 58)	3-hr
W	- Reinforced concrete (exterior wall	none
W	- Reinforced concrete (part adjacent to fire area 20)	3-hr

Floor:	Reinforced concrete(contains two open gratings adjacent to fire area 12, 40 sq ft and 87 sq ft respectively, and a 50 sq ft open grating also adjacent to fire area 12 that is located in the CFZ between fire areas 13N and 13S in the west corridor, unrated) One structural steel member adjacent to fire zone 12-13G will be coated with structural steel fire proofing.)	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 16 Corridors connecting to fire area 13N Door connecting to fire area 21	

(b) Major Components in Fire Area

MO3-10-025A	RHR Recirc Loop A Return Valve
MO3-10-026A	RHR Drywell Spray
MO3-10-031A	RHR Drywell Spray
SV-9130A	Backup N_2 Supply Valve
30Y32	Lighting Panel
30Y35	Distribution Panel
30S1048	Manual Power Transfer Switch for MCC30B383
LT3-2-3-110B	Reactor Water Level Transmitter
LT3-2-3-112	Reactor Water Level Transmitter
LT3-2-3-70	Reactor Water Level Transmitter
LT3-2-3-72B	Reactor Water Level Transmitter
MCC30B38	3C Motor Control Center
MCC30B81	3C/A Motor Control Center

MO3-14-011A	Outboard Core Spray Discharge Valve
MO3-14-012A	Inboard Core Spray Discharge Valve
PIT3-2-3-60B	Reactor Pressure Indicator Transmitter
PT-9102B	Drywell Pressure Transmitter
PT-9102D	Drywell Pressure Transmitter
PT-9458	Drywell Pressure Transmitter
PT3-2-3-404B	Reactor Pressure Transmitter
PT3-6-105	Reactor Pressure Transmitter
PT3-6-53B	Reactor Pressure Transmitter
AO-3520	Cont Atmos Control
MO-3373	Recirc Pumps Clg Wtr Isol
MO-3374	Recirc Pumps Clg Wtr Isol
SV3-03-33	Scram Disch Vol Vent Isol
SV3-03-36	Scram Disch Vol Vent Isol
SV-5948B	CAD Supply
SV-5949B	CAD Supply
SV-9130B	Instrument Nitrogen
AO-3519	Cont N_2 Purge
AO-3521A	Cont Atmos Control
AO-3521B	Cont Atmos Control
AO-3523	Cont Atmos Control
DPIS3-02-116C	Steam Line Flow
DPIS3-02-116D	Steam Line Flow
DPIS3-02-117C	Steam Line Flow
DPIS3-02-117D	Steam Line Flow
DPIS3-02-118C	Steam Line Flow
DPIS3-02-118D	Steam Line Flow
DPIS3-02-119C	Steam Line Flow
DPIS3-02-119D	Steam Line Flow
LIS3-02-3-058A	Main Steam and Feedwater
LIS3-02-3-058B	Main Steam and Feedwater
LT3-02-3-083A	Reactor Low Water Level Transmitter
LT3-02-3-083B	Reactor Low Water Level Transmitter
LT3-02-3-099C	Reactor Low Water Level Transmitter
LT3-02-3-099D	Reactor Low Water Level Transmitter
LT3-02-3-101C	Reactor Low Water Level Transmitter
LT3-02-3-101D	Reactor Low Water Level Transmitter
LT3-02-3-072D	Reactor High Water Level Transmitter
LT3-02-3-073B	Reactor Shroud Low Level Transmitter
PT3-02-3-052B	Reactor Low Pressure Transmitter
PT3-02-3-052D	Reactor Low Pressure Transmitter
PT3-02-3-404B	Reactor Pressure Transmitter
PT3-02-3-55C	Reactor Pressure Transmitter
PT3-02-3-55D	Reactor Pressure Transmitter
PT3-10-100B	Drywell High Pressure Transmitter
PT3-10-100D	Drywell High Pressure Transmitter
PT3-05-12C	Drywell High Pressure Transmitter

PT3-05-12D	Drywell High Pressure Transmitter
SV3-03-35B	Scram Disch Vent Isol
SV3-03-117	Control Rod Drive
SV3-03-118	Control Rod Drive
SV3-03-32A	Scram Disch Vent Isol
SV3-03-35A	Scram Disch Vent Isol

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) A boronated shield door in front of the access opening to the drywell with subsequent ignition from an outside source.

(3) Since there are no combustible materials located in the south isolation valve room and the neutron monitoring room, the origin of a postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room. Heat from a fire in the west corridor will cause heat detectors to activate which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. When both heat detectors in the west corridor are activated, a deluge valve will open supplying water to the water curtain system's open sprinkler heads to extinguish the fire. Fire will be prevented from passing through the corridor and affecting fire area 13N.

(e) Effect of Fire on Safe Shutdown

Fire Area 13S contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown method B for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Unit 2 and shutdown method B for Unit 3 has redundant

components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 13S, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown method B will be available to safely shut down Unit 3.

A postulated fire in the vicinity of the reactor vessel instrumentation reference leg backfill system could adversely affect reactor vessel water level indication due to reference leg density changes caused by an increase in water temperature. Since there are no fire initiators in close proximity to the backfill system tubing, administratively controlled transient combustible free zones throughout the locations of the backfill system on elevations 135 feet and 165 feet in the reactor building will preclude any adverse effect on level indication, due to fire, prior to annunciation in the main control room. Following annunciation in the main control room the backfill system will be administratively isolated from the reference legs.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of dampers in two ducts through the floor of elevation 135 feet CRD area could jeopardize secondary containment capability in the event of a reactor building isolation. Combustible loading is low, and chance of transmission of smoke through the ducts is low.

(2) An exemption from the requirements of Appendix R section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.9.(f)(2)) for three gratings located in the floor of the U3 reactor building on elevation 135'-0" which is adjacent to fire area 12. These gratings are located in fire area-zones 13S, 13S-20 (the neutron monitoring room) and in the CFZ in the west corridor between fire

areas 13N and 13S. The basis for the exemption was low combustible loading and the fire protection features present.

(3) An exemption from the requirements of Appendix R Section III.G.2 was granted in an SER from the NRC dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.10.(f)(2)) for the lack of automatic suppression throughout the area. The basis for the exemption is that Area 13N is separated from 13S by a CFZ on one side and an automatically actuated deluge water curtain and a CFZ on the other. Redundant safe shutdown components and cables are separated from each other via the CFZ. Automatic detection is provided. An engineering analysis evaluates the CFZ with respect to the equipment credited for safe shutdown in Fire Areas 13S and 13N, demonstrating that the separation provided is equivalent to III.G.2 of 10CFR 50 Appendix R.

(4) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

5.3.12 Fire Area 16: Unit 3 - Stairwell No. 22, Elevator Shaft (Elev. 91'-6" to 251'-8"); Elevator Machine Room (Elev. 251'-8").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete	2-hr
	E	- Reinforced concrete (part adjacent to fire area 50)	3-hr
	E	- Reinforced concrete (exterior wall elev. 234'-0")	2-hr
	S	- Reinforced concrete (parts adjacent to fire areas 2 and 25, exterior wall; elev. 195'-0")	3-hr
	S	- Reinforced concrete (exterior wall, elev. 234'-0")	2-hr
	W	- Reinforced concrete	2-hr

Floor:	Reinforced concrete foundation mat	none
	Reinforced concrete (elevation machine room)	3-hr
Ceiling:	Metal deck, nonreinforced concrete and built-up roofing	3-hr

Access: Doors connecting to fire areas 2, 12, 13N, 13S, 25, and 50

(b) Major Components in Fire Area

None.

(c) Postulated Fire in Area

Since there are no combustibles present, the origin of postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

Upon notification of a fire, the plant fire brigade will be dispatched to extinguish the fire.

(e) Effect of Fire on Safe Shutdown

Fire Area 16 does not contain safe shutdown cables or equipment.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 16, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for standby gas treatment system ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of dampers in two ducts through the north wall elevation 91'-6" could jeopardize secondary containment capability in the event of a reactor building isolation.

Combustible loading is low, and chance of transmission of smoke through the ducts is low.

5.3.13 Fire Area 17: Unit 2 - MSIV Room (Elev. 135'-0")

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (contains an 84 sq ft steel blowout panel, unrated)	3-hr
	E - Reinforced concrete (contains a 302 sq ft steel blowout panel, unrated)	3-hr
	S - Reinforced concrete	3-hr
	W - Reinforced concrete	3-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Two doors connecting to fire area 6N	

(b) Major Components in Fire Area

AO2-02-86A	Outboard Main Steam Isolation Valve
AO2-02-86B	Outboard Main Steam Isolation Valve
AO2-02-86C	Outboard Main Steam Isolation Valve
AO2-02-86D	Outboard Main Steam Isolation Valve
MO2-02-77	Main Steam Drain
MO2-02-78	Main Steam Drain
MO2-02-79	Main Steam Drain
MO2-13-016	Outboard RCIC Steam Supply Isolation Valve
MO2-13-021	Inboard RCIC Discharge Isolation Valve
MO2-23-019	Inboard HPCI Pump Discharge Valve

(c) Postulated Fire in Area

Since the combustible materials located in this area result in only few seconds of fire severity, the origin of a postulated fire is indeterminate. A fire caused by external sources in this area is unlikely because of high radiation levels during plant operation.

(d) Consequence of Fire with Active Fire Suppression

Upon notification of a fire, the plant fire brigade will be dispatched to extinguish the fire.

(e) Effect of Fire on Safe Shutdown

Fire Area 17 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method C for Unit 2 and shutdown methods A, B, and C for Unit 3 are related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown method C for Unit 2 and shutdown methods A, B, and C for Unit 3 has redundant components that are not affected by a fire in this area.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 17, shutdown method C will be available to safely shut down Unit 2 and shutdown methods A, B, and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.F of Appendix R was granted by the NRC in the SER dated March 13, 1985, for lack of detection in this area. The basis for the exemption is the lack of combustible material in the area, the inaccessibility of the area during plant operation, and that equipment required for SSD Method 2C is not located in the area, or has redundant equipment located outside the area.

(2) An exemption from Section III.G of Appendix R was granted by the NRC in the SER dated December 31, 1986, for ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of a damper in the supply or exhaust ductwork could cause a MSIV closure and a resultant reactor transient.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986 (see reference 18 in Appendix C and sections 5.3.5. (f)(5) and 5.3.40. (f)(2)) for separation of cables and equipment and non-safety circuits of redundant trains

by a fire barrier having a 3 hour rating. A steel blowout panel and labyrinth are provided for steam venting in the event of a high energy line break between fire areas 6N and 17 and between fire areas 17 and 50. There are no fixed combustibles in fire area 17. Operation of affected equipment in the MSIV room (room 208) occurs early in the safe shutdown scenario, and credited valves will not spuriously actuate.

5.3.14 Fire Area 18: Unit 2 - Drywell Area (Elev. 116'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	Reinforced concrete	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Reinforced concrete	none
Access:	Access hatches connecting to fire areas 6N and 6S Door connecting to fire area 19	

(b) Major Components in Fire Area

AO2-02-80A	Inboard Main Steam Isolation Valve
AO2-02-80B	Inboard Main Steam Isolation Valve
AO2-02-80C	Inboard Main Steam Isolation Valve
AO2-02-80D	Inboard Main Steam Isolation Valve
AO2-10-163A	Check Valve Bypass
AO2-10-163B	Check Valve Bypass
AO2-14-15A	Check Valve Bypass
AO2-14-15B	Check Valve Bypass
MO2-02-029A	Feedwater Injection Valve
MO2-02-029B	Feedwater Injection Valve
MO2-02-053A	Recirc Pump 2A Discharge Isolation Valve
MO2-02-053B	Recirc Pump 2B Discharge Isolation Valve
MO2-02-74	Main Steam Drain
MO2-10-018	RHR Shutdown Cooling Suction Valve
MO2-12-015	RWCU Containment Isolation Valve
MO2-13-015	Inboard RCIC Steam Supply Isolation Valve
MO2-23-015	Inboard HPCI Steam Supply Isolation Valve
POT2-02-071A	SRV Acoustic Monitor
POT2-02-071B	SRV Acoustic Monitor

POT2-02-071C	SRV Acoustic Monitor
POT2-02-071D	SRV Acoustic Monitor
POT2-02-071E	SRV Acoustic Monitor
POT2-02-071F	SRV Acoustic Monitor
POT2-02-071G	SRV Acoustic Monitor
POT2-02-071H	SRV Acoustic Monitor
POT2-02-071J	SRV Acoustic Monitor
POT2-02-071K	SRV Acoustic Monitor
POT2-02-071L	SRV Acoustic Monitor
RV2-02-070A	Main Steam Line Safety Valve
RV2-02-070B	Main Steam Line Safety Valve
RV2-02-071A	Main Steam Relief Valve
RV2-02-071B	Main Steam Relief Valve
RV2-02-071C	Main Steam Relief Valve
RV2-02-071D	Main Steam Relief Valve
RV2-02-071E	Main Steam Relief Valve
RV2-02-071F	Main Steam Relief Valve
RV2-02-071G	Main Steam Relief Valve
RV2-02-071H	Main Steam Relief Valve
RV2-02-071J	Main Steam Relief Valve
RV2-02-071K	Main Steam Relief Valve
RV2-02-071L	Main Steam Relief Valve
TE-2501-26	Drywell Temperature Element
TE-2501-27	Drywell Temperature Element
TE-2501-36A	Drywell Temperature Element
TE-2501-36B	Drywell Temperature Element
TE2-02-113A	SRV Disc Temperature Element
TE2-02-113B	SRV Disc Temperature Element
TE2-02-113C	SRV Disc Temperature Element
TE2-02-113D	SRV Disc Temperature Element
TE2-02-113E	SRV Disc Temperature Element
TE2-02-113F	SRV Disc Temperature Element
TE2-02-113G	SRV Disc Temperature Element
TE2-02-113H	SRV Disc Temperature Element
TE2-02-113J	SRV Disc Temperature Element
TE2-02-113K	SRV Disc Temperature Element
TE2-02-113L	SRV Disc Temperature Element

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Lube oil from the recirculating pumps either leaking onto the floor with subsequent ignition of the oil or an

overheating of the pumps causing ignition of the oil. A fire in this area during plant operation is extremely unlikely since the drywell is normally inerted with nitrogen.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 18 contains safe shutdown cables and equipment.

Since Fire Area 18 has an inerted atmosphere during normal operation, no fire is postulated that is considered capable of affecting the safe shutdown cables and equipment.

5.3.15 Fire Area 19: Unit 2 - Control Rod Drive Area (Elev. 116'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	Reinforced concrete	none
Floor:	Six-inch steel vessel encased by concrete	none
Ceiling:	Reinforced concrete	none
Access:	Door connecting to fire area 18	

(b) Major Components in Fire Area

Control rod drive mechanisms.

(c) Postulated Fire in Area

Since there are no combustible materials in the control rod drive area, the origin of a postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 19 does not contain safe shutdown cables or shutdown equipment.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 19, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

5.3.16 Fire Area 20: Unit 3 - MSIV Room (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete (contains an 84 sq ft steel blowout panel, unrated)	3-hr
	E	- Reinforced concrete (contains a 302 sq ft steel blowout panel, unrated)	3-hr
	S	- Reinforced concrete	3-hr
	W	- Reinforced concrete	none
Floor:		Reinforced concrete	3-hr
Ceiling:		Reinforced concrete	3-hr
Access:		Two doors connecting to fire area 13N	

(b) Major Components in Fire Area

AO3-02-86A	Outboard Main Steam Isolation Valve
AO3-02-86B	Outboard Main Steam Isolation Valve
AO3-02-86C	Outboard Main Steam Isolation Valve
AO3-02-86D	Outboard Main Steam Isolation Valve
MO3-02-77	Main Steam Drain
MO3-02-78	Main Steam Drain
MO3-02-79	Main Steam Drain
MO3-13-016	Outboard RCIC Steam Supply Isolation Valve

MO3-13-021	Inboard RCIC Discharge Isolation Valve
MO3-23-019	Inboard HPCI Pump Discharge Valve
MO3-2-038A	Main Steam and Feedwater
MO3-2-038B	Main Steam and Feedwater
MO3-12-068	RWCU Isolation Valve

(c) Postulated Fire in Area

Since there are no combustible materials in the MSIV room, the origin of a postulated fire is indeterminate. A fire caused by external sources in this area is extremely unlikely because of high radiation levels during plant operation.

(d) Consequence of Fire with Active Fire Suppression

Upon notification of a fire, the plant fire brigade will be dispatched to extinguish the fire.

(e) Effect of Fire on Safe Shutdown

Fire Area 20 contains safe shutdown cables and equipment.

Cables located in this area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown method C for Unit 3 are associated with equipment that has redundant components not affected by a fire in this area. Equipment located in this area that is associated with shutdown methods A, B, and C for Unit 2 and shutdown method C for Unit 3 has redundant components not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 20, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown method C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption to Section III.F of Appendix R was granted by the NRC in the SER dated March 13, 1985, for lack of detection in this area. The basis for the exemption is the lack of combustible material in the area, the inaccessibility of the area during plant operation, and that equipment required for SSD Method 3C is not located

in the area, or has redundant equipment located outside the area.

(2) An exemption from Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for ductwork through 3-hour fire barriers without fire dampers. Inadvertent closure of a damper in the supply or exhaust ductwork could cause a MSIV closure and a resultant reactor transient.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986 (see reference 18 in Appendix C and sections 5.3.10.(f)(4) and 5.3.40 (f)(2)) for separation of cables and equipment and non-safety circuits of redundant trains by a fire barrier having a 3 hour rating. A steel blowout panel and labyrinth are provided for steam venting in the event of a high energy line break between fire areas 13N and 20 and between fire areas 20 and 50. There are no fixed combustibles in fire area 20. Operation of affected equipment in the MSIV room (room 254) occurs early in the safe shutdown scenario, and credited valves will not spuriously actuate.

5.3.17 Fire Area 21: Unit 3 - Drywell Area (Elev. 116'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	Reinforced concrete	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Reinforced concrete	none
Access:	Access hatches connecting to fire areas 13N, and 13S Door connecting to fire area 22	

(b) Major Components in Fire Area

AO3-02-80A	Inboard Main Steam Isolation Valve
AO3-02-80B	Inboard Main Steam Isolation Valve
AO3-02-80C	Inboard Main Steam Isolation Valve
AO3-02-80D	Inboard Main Steam Isolation Valve

AO3-10-163A	Check Valve Bypass
AO3-10-163B	Check Valve Bypass
AO3-14-15A	Check Valve Bypass
AP3-14-15B	Check Valve Bypass
MO3-02-029A	Feedwater Injection Valve
MO3-02-029B	Feedwater Injection Valve
MO3-02-053A	Recirc Pump 3A Discharge Isolation Valve
MO3-02-053B	Recirc Pump 3B Discharge Isolation Valve
MO3-02-74	Main Steam Drain
MO3-10-018	RHR Shutdown Cooling Suction Valve
MO3-12-015	RWCU Containment Isolation Valve
MO3-13-015	Inboard RCIC Steam Supply Isolation Valve
MO3-23-015	Inboard HPCI Steam Supply Isolation Valve
POT3-02-071A	SRV Acoustic Monitor
POT3-02-071B	SRV Acoustic Monitor
POT3-02-071C	SRV Acoustic Monitor
POT3-02-071D	SRV Acoustic Monitor
POT3-02-071E	SRV Acoustic Monitor
POT3-02-071F	SRV Acoustic Monitor
POT3-02-071G	SRV Acoustic Monitor
POT3-02-071H	SRV Acoustic Monitor
POT3-02-071J	SRV Acoustic Monitor
POT3-02-071K	SRV Acoustic Monitor
POT3-02-071L	SRV Acoustic Monitor
RV3-02-070A	Main Steam Line Safety Valve
RV3-02-070B	Main Steam Line Safety Valve
RV3-02-070C	Main Steam Line Safety Valve
RV3-02-071A	Main Steam Line Relief Valve
RV3-02-071B	Main Steam Line Relief Valve
RV3-02-071C	Main Steam Line Relief Valve
RV3-02-071D	Main Steam Line Relief Valve
RV3-02-071E	Main Steam Line Relief Valve
RV3-02-071F	Main Steam Line Relief Valve
RV3-02-071G	Main Steam Line Relief Valve
RV3-02-071H	Main Steam Line Relief Valve
RV3-02-071J	Main Steam Line Relief Valve
RV3-02-071K	Main Steam Line Relief Valve
RV3-02-071L	Main Steam Line Relief Valve
TE-3501-26	Drywell Temperature Element
TE-3501-27	Drywell Temperature Element
TE-3501-36A	Drywell Temperature Element
TE-3501-36B	Drywell Temperature Element
TE-9455	Drywell Temperature Element
TE3-02-113A	SRV Disc Temperature Element
TE3-02-113B	SRV Disc Temperature Element
TE3-02-113C	SRV Disc Temperature Element
TE3-02-113D	SRV Disc Temperature Element

TE3-02-113E	SRV Disc Temperature Element
TE3-02-113F	SRV Disc Temperature Element
TE3-02-113G	SRV Disc Temperature Element
TE3-02-113H	SRV Disc Temperature Element
TE3-02-113J	SRV Disc Temperature Element
TE3-02-113K	SRV Disc Temperature Element
TE3-02-113L	SRV Disc Temperature Element
TE3-2-320	SRV Discharge Temperature Element

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type).

(2) Lube oil from the recirculating pumps either leaking onto the floor with subsequent ignition of the oil or an overheating of the pumps causing ignition of the oil. A fire in this area during plant operation is extremely unlikely since the drywell is normally inerted with nitrogen.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 21 contains safe shutdown cables and equipment.

Since Fire Area 21 has an inerted atmosphere during normal operation, no fire is postulated that is considered capable of affecting the safe shutdown cables and equipment.

5.3.18 Fire Area 22: Unit 3 - Control Rod Drive Area (Elev. 116'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	Reinforced concrete	none
Floor:	Six-inch steel vessel encased by concrete	none

Ceiling:	Reinforced concrete	none
Access:	Door connecting to fire area 21	

(b) Major Components in Fire Area

Control rod drive mechanisms.

(c) Postulated Fire in Area

Since there are no combustible materials in the control rod drive area, the origin of a postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 22 does not contain safe shutdown cables or shutdown equipment.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 22, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

5.3.19 Fire Area 25: Cable Spreading Room (Elev. 150'-0"), Computer Room (Elev. 150'-0"), Radwaste Building Fan Room, Control Room, Instrument Lab, Shop, Offices (Elev. 165'-0")

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	E - Reinforced concrete	3-hr
	S - Reinforced concrete	3-hr
	W - Reinforced concrete (parts adjacent to fire areas 27, 2, and 26)	3-hr
	W - Concrete masonry units (parts	3-hr

	adjacent to fire area 2)	
Floor:	Reinforced concrete	3-hr
	Reinforced concrete (control room)	none(smoke and hot gas barrier)
Ceiling:	Nonreinforced concrete and built-up roofing	none
	Reinforced concrete between column lines M-M and 18-23 (control room)	3-hour
Access:	Door connecting to fire area 27	
	Door connecting to fire area 2	
	Door connecting to fire area 26	
	Doors connecting to stairwell nos. 19 and 22	
	Six doors connecting to fire area 50	

(b) Major Components in Fire Area

Fire area 25 contains the controls, instrumentation, and logic for all the plant's major safety-related systems.

(c) Postulated Fire in Area

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is of the self-extinguishing type or coated with fire proofing material).

(2) Wood with subsequent ignition from an external source.

(3) Paper used in procedures with subsequent ignition.

(4) Carpet with subsequent ignition from an external source. (This is an unlikely event, however, because this carpet was specifically selected and tested to be resistant to ignition. Typically, carpet laid on a floor over concrete requires a well developed fire to ignite the carpet.)

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

In the cable spreading room, a signal from one smoke detector, will cause an audible-visual alarm in the main control room. Upon receipt of the alarm, the fire brigade will be dispatched to extinguish the fire. Fire dampers in HVAC openings above the doors into the cable spreading room will close when temperatures exceed 165°F. The system can be manually actuated by the fire brigade immediately outside the cable spreading room.

In the fan room, a fire in cable trays containing safety-related cable will activate line type heat detectors which will cause an audible-visual alarm in the main control room. Upon receipt of the alarm, the fire brigade will be dispatched to extinguish the fire. A signal from a smoke detector or THE operation of the manual pull station located at the valve station will open a deluge valve to supplying water to the pre-action sprinkler system in the fan room. Heat from a fire will cause the sprinkler heads(s) to fuse thus releasing water to control the fire.

In the control room, three cable trays above the false ceiling contain cable that is not IEEE-383 tested. These cables are covered with a fireproof coating. Line type heat detectors are provided in these trays. Heat from a fire in these trays will activate the heat detectors which will cause an audible-visual alarm annunciation at the fire alarm, the fire brigade will be dispatched to extinguish the fire. A total flooding of CO_2 system can be manually activated at either the north or south end of the computer room inside the cable spreading room to extinguish the fire. Fire dampers in HVAC ducts are provided with automatic electric release devices to close the openings.

(e) Effect of Fire on Safe Shutdown

Fire Area 25 contains safe shutdown cables and equipment.

Alternative shutdown capabilities (Method D) are available through the use of alternative shutdown panels, manual operator actions, and cable/raceway encapsulations.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses are presumed lost in accordance with Section III.L of Appendix R.

Therefore, for a fire in Fire Area 25, alternative shutdown method D will be available to safely shut down Units 2 and 3 from outside the Control Room.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C and section 5.3.2.(f)(2))for a steel angle between fire areas 02 and 25. A 4 inch high by 1/4 inch thick steel angle traverses the top of the wall between the two fire areas for its entire length. The basis for the exemption was the fire barrier geometry and combustible loading.

(2) An exemption was granted by the NRC from Section III.G.2 of Appendix R in an SER dated March 13, 1985, to allow in the cable spreading room

a. Two 1.5-hour-rated fire dampers in series in lieu of one 3-hour-rated damper.

b. One 1.5-hour-rated fire damper in lieu of a 3-hour-rated damper.

The two dampers in series are located in three places in the east and west walls. A single 1.5-hour damper is also located in three places in the east and west walls. Early warning fire detection is provided. The cable spreading room is provided with a total flooding CO_2 system.

(3) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the east and west walls in six separate locations in the remote shutdown panel area (fire zone 25-108A). Early warning fire detection is provided. Combustible loading is low.

(4) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the west wall of the control room (fire zone 25-108) in seven separate locations.

Early warning fire detection is provided. Combustible loading is low.

(5) An exemption for the requirements of Section III.G.2 of Appendix R was granted by the NRC in the SER dated December 31, 1986, for heating and ventilation ducts through a fire barrier without a 3-hour fire damper. The ducts penetrate the west wall of the remote shutdown panel area duct chase, elevation 150 feet and the radwaste building heating and ventilating compartment. The installation of a damper in either of the ducts would potentially contaminate clean radiological areas and expose workers to unacceptable radiation hazards. Combustible loading in the area is low with most of the combustibles associated with cable tray near the ceiling of the remote shutdown panel area.

(6) An exemption was granted in the SER dated March 13, 1985, from the requirements of Appendix R, Section III.G.3 for a fixed suppression system in the control room. The control room is continuously occupied, protected with an automatic smoke detection system, and protected with portable fire extinguishers and manual hose stations adjacent to the control room entrances. Alternative shutdown capability will be provided outside the control room.

(7) NRC approval of the installation of carpeting in the main control room was granted in an SER dated October 10, 1985 (see reference 3 in Appendix C). Subsequent to receipt of the SER, clarification was provided in a letter from the licensee to the NRC dated May 29, 1986 (see reference 3 in Appendix C).

(8) In accordance with Generic Letter 86-10, a fire hazard analysis has been performed to demonstrate that the 10-gauge metal deck ceiling between areas 02 and 25 provides a fire resistance equivalent to that required by the barrier (see reference 10 in Appendix C and section 5.3.2(f)(1)). The analysis credits low combustible loading.

(9) The NRC approved a License Amendment Request and issued a Safety Evaluation on June 24, 2005, for changes to the PBAPS 2 & 3 Fire Protection Program. The modifications involved converting the exiting automatic carbon dioxide fire suppression systems installed in each of the four

emergency diesel generator rooms and cable spreading room to manual actuation.

5.3.20 Fire Area 26: Unit 3 - M-G Set Ventilation Supply Fan Room (Elev. 165'-0").

(a) Structural and Architectural Design Features of Fire Area

Construction		Rating
Walls:	N - Reinforced concrete	3-hr
	E - Reinforced concrete	3-hr
	S - Reinforced concrete	3-hr
	W - Reinforced concrete (exterior wall with louvered openings)	none
Floor:	Reinforced concrete	3-hr
Ceiling:	Metal deck nonreinforced concrete and built-up roofing	none
Access:	Door connecting to fire area 25	

(b) Major Components in Fire Area

None.

(c) Postulated Fire in Area

Since there are no combustible materials in the area, the origin of a postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 26 contains safe shutdown cables but does not contain safe shutdown equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown methods A and C for Unit 3 are either related to equipment with redundant components not affected by a fire in this area, or

related to equipment for which manual operator actions can be taken to recover any functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 or 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 26, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown methods A and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

(2) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.21 Fire Area 27: Unit 2 - M-G Set Ventilation Supply Fan Room (Elev. 165'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete	3-hr
	E	- Reinforced concrete	3-hr
	S	- Reinforced concrete	3-hr
	W	- Reinforced concrete (exterior wall with louvered openings)	none
Floor:		Reinforced concrete	3-hr
Ceiling:		Metal deck nonreinforced concrete and built-up roofing	none

Access: Door connecting to fire area 25

(b) Major Components in Fire Area

None.

(c) Postulated Fire in Area

Since there are no combustible materials in the area, the origin of a postulated fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 27 contains safe shutdown cables but does not contain safe shutdown equipment.

Cables located in this fire area that are associated with shutdown methods B and C for Unit 2 and shutdown methods A, B, and C for Unit 3 are either related to equipment with redundant components not affected by a fire in this area, or are related to equipment for which manual operator actions can be taken to recover any functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 27, shutdown methods B and C will be available to safely shut down Unit 2 and shutdown methods A, B, and C will be available to safely shut down Unit 3.

5.3.22 Fire Area 30: Battery Room 268 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete	3-hr
	E	- Reinforced concrete	3-hr

	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 31 Door connecting to fire area 50	

(b) Major Components in Fire Area

3BD01	Station Battery
3BD18	Distribution Panel
3DD01	Station Battery

(c) Postulated Fire in Area

Ignition of electrical cabling from cables outside of conduit (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 30 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A and C for Units 2 and 3 are either related to equipment with redundant components not affected by a fire in this area or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A and C for Units 2 and 3 may have redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 30, shutdown methods A and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the south wall. Early warning fire detection is provided. Combustible loading is low.

(3) An exemption was granted by the NRC in the SER dated December 31, 1986, from Appendix R, Section III.G.2 for protecting structural steel forming a part of or supporting fire barriers to provide fire resistance equivalent to that required of the barrier. Calculations indicate that critical steel temperatures will not be exceeded with one door open.

(4) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.23 Fire Area 31: Battery Room 266 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	E - Concrete masonry units	2-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr

Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 30 Door connecting to fire area 57	

(b) Major Components in Fire Area

3AD01	3A Station Battery
3AD18	Distribution Panel
3CD01	Station Battery

(c) Postulated Fire in Area

Ignition of electrical cabling from cables outside of conduit (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 31 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods B and C for Unit 2 and shutdown method B for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that

is associated with shutdown methods B and C for Unit 2 and shutdown method B for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 31, shutdown methods B and C will be available to safely shut down Unit 2 and shutdown method B will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the east wall. Early warning fire detection is provided. Combustible loading is low.

(3) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

5.3.24 Fire Area 32: Emergency Switchgear Room 261 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Concrete masonry units	2-hr
	E	- Concrete masonry units	2-hr
	S	- Concrete masonry units	2-hr
	W	- Concrete masonry units	2-hr

Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 57 Door connecting to fire area 33	

(b) Major Components in Fire Area

30A17	3C Emergency Auxiliary Switchgear
3AD03-1,-2	Battery Charger
3CD03-1,-2	Battery Charger

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 32 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods B and C for Unit 2 and shutdown method B for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods B and C for Unit 2 and

shutdown method B for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 32, shutdown methods B and C will be available to safely shut down Unit 2 and shutdown method B will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the east wall. Early warning fire detection is provided. Combustible loading is low.

(3) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(4) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

5.3.25 Fire Area 33: Emergency Switchgear Room 267 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

Construction	Rating

Walls:	N - Concrete masonry units	2-hr
	E - Reinforced concrete	3-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 32 Door connecting to fire area 50	

(b) Major Components in Fire Area

30A15	3A Emergency Auxiliary Switchgear
30S598	MO3-10-016A Automatic Power Transfer Switch
MCC30B59	3A Motor Control Center

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 33 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods B and C for Unit 2 and shutdown method C for Unit 3 are either encapsulated by a qualified fire barrier,

related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods B and C for Unit 2 and shutdown method C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 33, shutdown methods B and C will be available to safely shut down Unit 2 and shutdown method C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

5.3.26 Fire Area 34: Emergency Switchgear Room 265 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

Construction	Rating

Walls:	N - Concrete masonry units	2-hr
	E - Concrete masonry units	2-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 57 Door connecting to fire area 35	

(b) Major Components in Fire Area

30A18	3D Emergency Auxiliary Switchgear
3BD03-1,-2	Battery Charger
3DD03-1,-2	Battery Charger
3DD19X	Fuse Box
3DD306	125 VDC Panel
MCC00B50	480 V AC Motor Control Center

(c) Postulated Fire in Area

Ignition of electrical cabling from cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 34 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A and C for Units 2 and 3 are either encapsulated by a qualified fire barrier, or related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown methods A and C for Units 2 and 3 has redundant components that are not affected by a fire in this area.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 34, shutdown methods A and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the west wall. Early warning fire detection is provided. Combustible loading is low.

(3) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(4) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

5.3.27 Fire Area 35: Emergency Switchgear Room 263

(Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Concrete masonry units	2-hr
	E - Reinforced concrete	3-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 34 Door connecting to fire area 50	

(b) Major Components in Fire Area

30A16 3B Emergency Auxiliary Switchgear

MCC30B60 3B Motor Control Center

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 35 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A and C for Unit 2 and shutdown method A for Unit 3 are either encapsulated by a qualified fire barrier, or related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown methods A and C for Unit 2 and shutdown method A for Unit 3 has redundant components that are not affected by a fire in this area.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 35, shutdown methods A and C will be available to safely shut down Unit 2, and shutdown method A will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

5.3.28 Fire Area 36: Emergency Switchgear Room 226 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Concrete masonry units	2-hr

	E - Concrete masonry units	2-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 57 Door connecting to fire area 37	

(b) Major Components in Fire Area

20A18	2D Emergency Auxiliary Switchgear
2BD03-1,-2	Battery Charger
2DD03-1,-2	Battery Charger
20S598	MO-2-10-16D Automatic Power Transf./Isol. Switch

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 36 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method A for Units 2 and 3 are either encapsulated by a qualified fire barrier, related to equipment with

redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method A for Units 2 and 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 36, shutdown method A will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the west wall. Early warning fire detection is provided. Combustible loading is low.

(3) The basis for the exemption granted by the NRC for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(4) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

(5) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire

operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.29 Fire Area 37: Emergency Switchgear Room 231 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Concrete masonry units	2-hr
	E - Reinforced concrete	3-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 36 Door connecting to fire area 50	

(b) Major Components in Fire Area

20A16	2B Emergency Auxiliary Switchgear
2BD306	Distribution Panel
MCC20B60	2B Motor Control Center

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water

to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 37 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method A for Unit 2 and shutdown methods A and C for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method A for Unit 2 and shutdown methods A and C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 37, shutdown method A will be available to safely shut down Unit 2 and shutdown methods A and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated

October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

(4) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.30 Fire Area 38: Emergency Switchgear Room 217 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Concrete masonry units	2-hr
	E - Concrete masonry units	2-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 57 Door connecting to fire area 39	

(b) Major Components in Fire Area

20A17	2C Emergency Auxiliary Switchgear
2AD03-1,-2	Battery Charger
2CD03-1,-2	Battery Charger

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 38 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method B for Unit 2 and shutdown methods B and C for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method B for Unit 2 and shutdown methods B and C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 38, shutdown method B will be available to safely shut down Unit 2 and shutdown methods B and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-

hour damper in the west wall. Early warning fire detection is provided. Combustible loading is low.

(3) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(4) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

(5) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

5.3.31 Fire Area 39: Emergency Switchgear Room 227 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Concrete masonry units	2-hr
	E - Reinforced concrete	3-hr
	S - Concrete masonry units	2-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 38 Door connecting to fire area 50	

(b) Major Components in Fire Area

20A15 2A Emergency Auxiliary Switchgear

MCC20B59 2A Motor Control Center

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 39 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method B for Unit 2 and shutdown methods B and C for Unit 3 are either encapsulated by a qualified fire barrier, or related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown method B for Unit 2 and shutdown methods B and C for Unit 3 has redundant components that are not affected by a fire in this area.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 39, shutdown method B will be available to safely shut down Unit 2, and shutdown methods B and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls in the fire area. The basis credits low combustible loading.

5.3.32 Fire Area 40: Battery Room 225 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Concrete masonry units	2-hr
	E - Reinforced concrete	3-hr
	S - Reinforced concrete	3-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 41 Door connecting to fire area 50	

(b) Major Components in Fire Area

2BD01	2B Station Battery
2BD18	Distribution Panel
2DD01	Station Battery

(c) Postulated Fire in Area

Ignition of electrical cabling from cables outside of conduit (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 40 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A and C for Units 2 and 3 are either encapsulated by a qualified fire barrier, or related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown methods A and C for Units 2 and 3 has redundant components that are not affected by a fire in this area.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary bus may be affected by a fire in this area. Offsite power to the 4kV switchgear via the 00A020 emergency auxiliary bus is not affected by a fire in this area.

Therefore, for a fire in Fire Area 40, shutdown methods A and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the

2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two 1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the north wall. Early warning fire detection is provided. Combustible loading is low.

(3) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

5.3.33 Fire Area 41: Battery Room, Room 218 (Elev. 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Concrete masonry units	2-hr
	E - Concrete masonry units	2-hr
	S - Reinforced concrete	3-hr
	W - Concrete masonry units	2-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete	3-hr
Access:	Door connecting to fire area 57 Door connecting to fire area 40	

(b) Major Components in Fire Area

2AD01	2A Station Battery
2AD18	Distribution Panel
2CD01	2C Station Battery

(c) Postulated Fire in Area

Ignition of electrical cabling from cables outside of conduit (an unlikely occurrence in the absence of a fire source

external to the cabling since power cable is of the self-extinguishing type).

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 41 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method B for Unit 2 and shutdown methods B and C for Unit 3 are either encapsulated by a qualified fire barrier, or related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown method B for Unit 2 and shutdown methods B and C for Unit 3 has redundant components that are not affected by a fire in this area.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 41, shutdown method B will be available to safely shut down Unit 2, and shutdown methods B and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls surrounding the fire area. The basis credits low combustible loading.

(2) An exemption was granted by the NRC in the SER dated March 13, 1985, from Section III.G.2 of Appendix R to allow two

1.5-hour-rated fire dampers in series in lieu of one 3-hour damper in the north wall. Early warning fire detection is provided. Combustible loading is low.

(3) The basis for the exemption granted by the NCR for not protecting structural steel in the area in the SER dated December 31, 1986 (see reference 18 in Appendix C) was changed in the submittal to the NRC indicating completion of modification P00813 (see reference 26 in Appendix C). The new basis credits the pre-action sprinkler system installed in the area.

5.3.34 Fire Area 43: Diesel Generator Building Bay D (Elev. 127'-0" and 151'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (exterior wall)	none
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete	3-hr
	W - Reinforced concrete (exterior wall)	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Nonreinforced concrete and E.P.D.M Membrane roofing	none
Access:	Two doors connecting to fire area 44 Two doors exiting building	

(b) Major Components in Fire Area

0DV64	E4 DG Building Vent Supply
0DV91	E4 DG Building Supply Fan
0DD13	Distribution Panel
0DG12	E4 Diesel Generator
0DP167	E4 Lube Oil Pump
0DP60	E4 Oil Transfer Pump
MCC00B56	Motor Control Center

0DC216 DG Cardox Control Panel

(c) Postulated Fire in Area

(1) Fuel oil leaking onto the floor with subsequent ignition of the fuel.

(2) Lube oil leaking onto the floor with subsequent ignition of the fuel.

(d) Consequence of Fire with Active Fire Suppression

Heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. There are nine heat detectors in this diesel generator bay including one in the day tank room. A manually actuated, fixed, total flooding CO_2 fire suppression system is provided in this diesel generator bay.

(e) Effect of Fire on Safe Shutdown

Fire Area 43 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown methods A and C for Unit 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Unit 2 and shutdown methods A and C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 43, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown methods A and C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

(1) An exemption to Section III.F of Appendix R was granted by the NRC in the SER dated March 13, 1985, for lack of automatic fire detection in the ventilation supply enclosures of the diesel generator building. There are no fixed combustibles in the area.

(2) The NRC approved a License Amendment Request and issued a Safety Evaluation on June 24, 2005, for changes to the PBAPS 2 and 3 Fire Protection Program. The modifications involved converting the automatic carbon dioxide fire suppression systems installed in each of the four emergency diesel existing generator rooms and cable spreading room to manual actuation.

5.3.35 Fire Area 44: Diesel Generator Building Bay C (Elev. 127'-0" and 151'-0").

(a) Structural and Architectural Design Features of Fire Area

Construction		Rating
Walls:	N - Reinforced concrete	3-hr
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete	3-hr
	W - Reinforced concrete (exterior wall)	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Nonreinforced concrete and E.P.D.M. Membrane roofing	none
Access:	Two doors connecting to fire area 43 One door connecting to fire area 45 Two doors exiting building	

(b) Major Components in Fire Area

0CV64	E3 DG Building Vent Supply
0CV91	E3 DG Building Supply Fan
0CD13	Distribution Panel
0CG12	E3 Diesel Generator

0CP167	E3 Lube Oil Pump
0CP60	E3 Oil Transfer Pump
MCC00B55	Motor Control Center
0CC216	DG Cardox Control Panel

(c) Postulated Fire in Area

(1) Fuel oil leaking onto the floor with subsequent ignition of the fuel.

(2) Lube oil leaking onto the floor with subsequent ignition of the fuel.

(d) Consequence of Fire with Active Fire Suppression

Heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room.

There are nine heat detectors in this diesel generator bay including one in the day tank room. A manually actuated, fixed, total flooding CO_2 fire suppression system is provided in this diesel generator bay.

(e) Effect of Fire on Safe Shutdown

Fire Area 44 contains safe shutdown cables and equipment.

Cables located in this area that are associated with shutdown methods B and C for Units 2 and 3 are associated with equipment that has redundant components not affected by a fire in this area. Equipment located in this area that is associated with shutdown methods B and C for Units 2 and 3 has redundant components not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 44, shutdown methods B and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption to Section III.F of Appendix R was granted by the NRC in the SER dated March 13, 1985, for lack of automatic fire detection in the ventilation supply enclosures of the diesel generator building. There are no fixed combustibles in the area.

(2) The NRC approved a License Amendment Request and issued a Safety Evaluation on June 24, 2005, for changes to the PBAPS 2 and 3 Fire Protection Program. The modifications involved converting the automatic carbon dioxide fire suppression systems installed in each of the four emergency diesel existing generator rooms and cable spreading room to manual actuation.

5.3.36 Fire Area 45: Diesel Generator Building Bay B (Elev. 127'-0" and 151'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete	3-hr
	W - Reinforced concrete (exterior wall)	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Nonreinforced concrete and E.P.D.M. Membrane roofing	none
Access:	One door connecting to fire area 44 Two doors connecting to fire area 46 Two doors exiting building	

(b) Major Components in Fire Area

0BV64	E2 DG Building Vent Supply
0BV91	E2 DG Building Supply Fan
0BD13	Distribution Panel
0BG12	E2 Diesel Generator
0BP167	E2 Lube Oil Pump

0BP60	E2 Oil Transfer Pump
MCC00B54	Motor Control Center
0BC216	DG Cardox Control Panel

(c) Postulated Fire in Area

(1) Fuel oil leaking onto the floor with subsequent ignition of the fuel.

(2) Lube oil leaking onto the floor with subsequent ignition of the fuel.

(d) Consequence of Fire with Active Fire Suppression

Heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room.

There are nine heat detectors in this diesel generator bay including one in the day tank room. A manually actuated, fixed, total flooding CO_2 fire suppression system is provided in this diesel generator bay.

(e) Effect of Fire on Safe Shutdown

Fire Area 45 contains safe shutdown cables and equipment.

Cables located in this area that are associated with shutdown methods A and C for Units 2 and 3 are associated with equipment that has redundant components not affected by a fire in this area. Equipment located in this area that is associated with shutdown methods A and C for Units 2 and 3 has redundant components not affected by a fire in this area.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary bus may be affected by a fire in this area. Offsite power to the 4kV switchgear via the 00A020 emergency auxiliary bus is not affected by a fire in this area.

Therefore, for a fire in Fire Area 45, shutdown methods A and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption to Section III.F of Appendix R was granted by the NRC in the SER dated March 13, 1985, for lack of automatic fire detection in the ventilation supply enclosures of the diesel generator building. There are no fixed combustibles in the area.

(2) The NRC approved a License Amendment Request and issued a Safety Evaluation on June 24, 2005, for changes to the PBAPS 2 and 3 Fire Protection Program. The modifications involved converting the automatic carbon dioxide fire suppression systems installed in each of the four emergency diesel existing generator rooms and cable spreading room to manual actuation.

5.3.37 Fire Area 46: Diesel Generator Building Bay A (Elev. 127'-0" and 151'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete	3-hr
	W - Reinforced concrete (exterior wall)	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Nonreinforced concrete and E.P.D.M. Membrane roofing	none
Access:	Two doors connecting to fire area 45 One door connecting to fire area 54 Two doors exiting building	

(b) Major Components in Fire Area

0AV64	E1 DG Building Vent Supply
0AV91	E1 DG Building Supply Fan
0AD13	Distribution Panel
0AG12	E1 Diesel Generator
0AP167	E1 Lube Oil Pump

0AP60	E1 Oil Transfer Pump
MCC00B53	Motor Control Center
0AC216	DG Cardox Control Panel

(c) Postulated Fire in Area

(1) Fuel oil leaking onto the floor with subsequent ignition of the fuel.

(2) Lube oil leaking onto the floor with subsequent ignition of the fuel.

(d) Consequence of Fire with Active Fire Suppression

Heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. There are nine heat detectors in this diesel generator bay including one in the day tank room. A manually actuated, fixed, total flooding CO_2 fire suppression system is provided in this diesel generator bay.

(e) Effect of Fire on Safe Shutdown

Fire Area 46 contains safe shutdown cables and equipment.

Cables located in this area that are associated with shutdown methods B and C for Units 2 and 3 are associated with equipment that has redundant components not affected by a fire in this area. Equipment located in this area that is associated with shutdown methods B and C for Units 2 and 3 has redundant components not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 46, shutdown methods B and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption to Section III.F of Appendix R was granted by the NRC in the SER dated March 13, 1985, for lack of automatic fire detection in the ventilation supply

enclosures of the diesel generator building. There are no fixed combustibles in the area.

(2) The NRC approved a License Amendment Request and issued a Safety Evaluation on June 24, 2005, for changes to the PBAPS 2 and 3 Fire Protection Program. The modifications involved converting the automatic carbon dioxide fire suppression systems installed in each of the four emergency diesel existing generator rooms and cable spreading room to manual actuation.

5.3.38 Fire Area 47: Unit 3 - Pump Structure HPSW and ESW Room (Elev. 112'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete	3-hr
	E	- Reinforced concrete (exterior wall)	none
	S	- 1/4-inch-thich metal plate see exemption request	
	W	- Reinforced concrete (exterior wall) no rating below elev. 116'-0")	3-hr
Floor:		Reinforced concrete foundation mat	none
Ceiling:		Nonreinforced concrete and built-up roofing	none
Access:		Door connecting to fire area 52 Door connecting to fire area 48	

(b) Major Components in Fire Area

00P064	Motor Driven Fire Pump
0BP57	ESW Pump
3AP42	HPSW Pump
3BP42	HPSW Pump
3CP42	HPSW Pump
3DP427	HPSW Pump
516B	HPSW Unit Intertie Valve

MCC00B62	Motor Control Center, 480V AC
MCC30B383	480V AC Motor Control Center Remote Starter
MO-3344	HPSW Header Crosstie
PT-0236B	ESW Pump Discharge Pressure Transmitter
PT-3330A	HPSW Pressure Transmitter
PT-3330B	HPSW Pump Pressure Transmitter
PT-3330C	HPSW Pump Pressure Transmitter
PT-3330D	HPSW Pump Pressure Transmitter

(c) Postulated Fire in Area

(1) Deleted

(2) Lube oil from the pumps either leaking onto the floor with subsequent ignition of the oil or an overheating of te pumps causing ignition of the oil.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause a audible-visual alarm annunciation at the fire alarm annunciator in the main control room. Heat generated by the fire will activate a heat detector which will cause an audible-visual annunciation at the fire alarm annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 47 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Units 2 and 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Units 2 and 3 has redundant components that are not affected by a

fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 47, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Appendix R section III.G.3 was granted in an NRC SER dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.39.(f)(1)); however, the 1/4 inch thick steel wall between fire areas 48 and 47 was approved in an SER from the NRC dated May 23, 1979 (see reference 21 in Appendix C). Therefore, compliance with Appendix R section III.G.2 is achieved and an exemption from section III.G.3 is no longer required.

5.3.39 Fire Area 48: Unit 2 - Pump Structure HPSW and ESW Room (Elev. 112'-0").

(a) Structural and Architectural Design Features of Fire Area

Construction		Rating
Walls:	N - 1/4-inch-thick metal plate	see exemption request
	E - Concrete masonry units	2-hr
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete	3-hr
	S - Concrete masonry units (part adjacent to pump room)	2-hr
	W - Reinforced concrete (exterior wall)	3-hr
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Nonreinforced concrete and built-up roofing	none
Access:	Door connecting to fire area 47 Two doors connecting to fire area 53 Door exiting building	

(b) Major Components in Fire Area

OAP57	ESW Pump
2AP42	HPSW Pump
2BP42	HPSW Pump
2CP42	HPSW Pump
2DP42	HPSW Pump
516A	HPSW Unit Intertie Valve
MO-2344	HPSW Header Crosstie
PT-0236A	ESW Pump Discharge Pressure Transmitter
PT-2330A	HPSW Pressure Transmitter
PT-2330B	HPSW Pump Pressure Transmitter
PT-2330C	HPSW Pump Pressure Transmitter
PT-2330D	HPSW Pump Pressure Transmitter

(c) Postulated Fire in Area

(1) Deleted

(2) Lube oil from the pumps either leaking onto the floor with subsequent ignition of the oil or an overheating of the pumps causing ignition of the oil.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause a audible-visual alarm annunciation at the fire alarm annunciator in the main control room. The heat generated by the fire will activate a heat detector which will cause an audible-visual annunciation at the fire alarm annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 48 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Units 2 and 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Units 2 and 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 48, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Appendix R section III.G.3 was granted in an NRC SER dated March 13, 1985 (see reference 19 in Appendix C and section 5.3.38.(f)(1)); however, the 1/4 inch thick steel wall between fire areas 48 and 47 was approved in an SER from the NRC dated May 23, 1979 (see reference 21 in Appendix C). Therefore, compliance with Appendix R section III.G.2 is achieved and an exemption from section III.G.3 is no longer required.

5.3.40 Fire Area 50: Turbine Building

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete (part adjacent to fire area 2)	3-hr
	N - Reinforced concrete (exterior wall)	none
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete (part adjacent to fire area 2)	3-hr
	W - Reinforced concrete (part adjacent to fire areas 2, 5, 6N, 6S, 12, 13N, and 13S (J - line, below elev. 195'-0") and 25; contains two 302 sq ft steel	3-hr

	blowout panels, elev. 151', adjacent to areas 17 and 20 respectively, unrated - see 5.3.40(f)(2))	
	W - Reinforced concrete (part above elev. 195'-0"; adjacent to fire areas 6S and 13N and exterior wall)	3-hr
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Reinforced concrete (part adjacent to emergency switchgear and battery rooms)	3-hr
	Metal deck, nonreinforced concrete and built-up roofing	none
Access:	Twenty-six doors connecting turbine units and reactor units 2 and 3	
	Six doors exiting fire areas to outside	

(b) Major Components in Fire Area

LT-2217	Condensate Storage Tank Water Level Transmitter
LT-3217	Condensate Storage Tank Water Level Transmitter
LT-9459	Condensate Storage Tank Water Level Transmitter
3OD08	DC Motor Control Center
2OD08	125 VDC Distribution Panel
FT2-10-97A	HPSW Flow Transmitter
FT2-10-97B	HPSW Flow Transmitter
FT3-10-177	HPSW Flow Transmitter
FT3-10-97A	HPSW Flow Transmitter
FT2-10-97B	HPSW Flow Transmitter
FT3-10-177	HPSW Flow Transmitter
FT3-10-97A	HPSW Flow Transmitter
FT3-10-97B	HPSW Flow Transmitter
HV-3-27B-36034	Unit 3 Demin Return Header to or from Unit 3 CST

(c) Postulated Fire in Area

Fire area 50 is the turbine building, excluding the control structure. Combustible material is located throughout the area. Types of postulated fires are described below. For identification of which type of fire could occur in a given room, refer to Chapter 4.

(1) Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since power cable is of the self-extinguishing type).

(2) Lube oil from pumps, storage tanks, reservoirs, and conditioners leaking onto the floor with subsequent ignition of the oil.

(3) Ignition of trash.

(4) Wood and paper with subsequent ignition.

(5) The ignition of plastic from battery cases.

(6) Rubber and volatile chemicals with subsequent ignition in the chemistry laboratories.

(7) Cloth from rags in the janitor's room.

(d) Consequence of Fire with Active Fire Suppression

Automatic fire detection is provided in the Unit 2 condensate pump pit area, condensate demineralizer pipe tunnels, valve operating areas, switchgear area, laboratories, corridor adjacent to feedwater heater rooms, and on the turbine deck above the turbine bearing lube oil lift pumps. The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room.

The 13.8 kV switchgear rooms, located in the center area of the turbine building at elevation 116 feet, are supervised with nitrogen and incorporate double interlock deluge valve that is maintained normally closed. Heat generated by a fire will melt the fusible link on the affected sprinkler heads at a predetermined temperature causing the nitrogen in the pipe to

be released which activates an alarm light in the control room. Sprinkler flow is initiated only when two separate inputs are received: one from a pneumatic actuator, due to the melting of the sprinkler fusible link(s) releasing the nitrogen; and the other from the fire detection system that sends a signal to an electronic solenoid valve.

Heat from a fire in the Unit 2 and 3 condenser areas, the area underneath the turbine decks, the moisture separator areas, or the feedwater heater platforms will cause the fusible link on the affected sprinkler heads to melt at a predetermined temperature. Water in the wet pipe sprinkler system will flow out through the opened heads to extinguish the fire.

Heat from a fire in any of the Unit 2 or 3 main turbine lube oil storage tanks and reservoir rooms will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. Water in the wet pipe sprinkler system will flow out through the opened heads to extinguish the fire.

In addition, water curtain suppression systems are provided to the HELB vent path openings over doorways 87 and 171. These water curtain suppression systems are extensions of the existing sprinkler systems in the main turbine lube oil storage tank rooms at elevation 116’-0”. Heat generated by a fire on either side of the doorways will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. Water in the wet pipe sprinkler system will flow out of the opened heads forming a water curtain to prevent the propagation of the fire through the openings.

Heat generated by a fire in the laydown areas in the center of the turbine building below either elevation 165 feet or 135 feet will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. Water in the wet pipe sprinkler system will flow out the opened sprinkler to control the fire.

In the 13.2 kV switchgear areas on elevation 116’-0”, smoke generated by a fire will be detected by smoke detectors located in the area which will cause an audible-visual alarm in the main control room. Upon receipt of the alarm the fire brigade will be dispatched to the area. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the area. The

permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

Heat generated by a fire in the Clean Clothes Room will cause will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. Water in the wet pipe sprinkler system will flow out of the opened heads to extinguish the fire.

Heat generated by a fire near the hydrogen seal oil units will activate a heat detector. A signal from the heat detector will actuate a deluge valve causing water to flow out of open heads above the hydrogen seal oil units. The fire brigade can manually release the deluge valve on elevation 116 feet in the turbine building laydown area to extinguish the fire.

Heat generated by a fire in the generator equipment area on elevation 135 feet will melt the fusible link on the affected sprinkler heads at a predetermined temperature. Water in the wet pipe sprinkler system will flow out of the opened heads to extinguish the fire. Heat generated by a fire in the reactor feed pump turbine lube oil reservoir on elevations 135 feet and 150 feet will melt the fusible link on the affected sprinkler heads at a predetermined temperature. Water from the wet pipe sprinkler system will flow out of the opened heads to extinguish the fire.

Heat generated by a fire in the drummed lube oil storage room will melt the fusible link on the affected sprinkler heads at a predetermined temperature. Water from the wet pipe sprinkler system will flow out of the opened heads to extinguish the fire.

Heat generated by a fire west of the feedwater heater platforms in each unit will melt the fusible link on the affected sprinkler heads at a predetermined temperature. Water from the wet pipe sprinkler system will flow out of the opened heads to extinguish the fire. Heat generated by a fire above the platform east of the cable spreading room will melt the fusible link on the affected sprinkler heads at a predetermined temperature. Water in the wet pipe sprinkler system will flow out of the opened heads to extinguish the fire.

Heat generated by a fire in the reactor feed pump turbine areas on elevation 165 feet will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. Water in the wet pipe sprinkler system will flow out of the opened heads to extinguish the fire.

Heat generated by a fire under the turbine lagging will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. The dry pipe sprinkler system is pressurized with nitrogen. When a sprinkler head opens, pressure in the system decreases causing an annunciation in the main control room. The fire brigade would then determine if the system should be manually actuated to extinguish the fire.

Heat generated by a fire at the turbine bearings, generator bearings, or front standard will melt the fusible link on the affected sprinkler heads at a predetermined temperature, causing the sprinkler heads to open. Water from the wet pipe sprinkler system will flow out of the opened heads to control the fire.

Heat generated by a fire in the H_2 Water Chemistry valve station area or within the H_2 injection point shrouds will activate a heat detector. The signal from the heat detector will cause an annunciation in the control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 50 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method A for Units 2 and 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method A for Units 2 and 3 may have redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary bus is not affected by a fire in this area. Offsite power to the 4kV switchgear via the

00A020 emergency auxiliary bus may be affected by a fire in this area.

Therefore, for a fire in Fire Area 50, shutdown method A will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from Section III.F of Appendix R was granted by the NRC for lack of detection in the offgas pipe tunnels. The only safety-related equipment in the room is cable inside conduit. There are no fixed combustibles, and the area is inaccessible at power due to high radiation.

(2) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986, for separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating (see reference 18 in Appendix C and sections 5.3.13.(f)(3) and 5.3.16.(f)(3)). A steel blowout panel and labyrinth are provided for steam venting in the event of a high energy line break. There are no fixed combustibles in fire areas 17 and 20. Operation of the affected equipment in the MSIV rooms occurs early in the FSSD scenario, and no spurious actuation in the room can affect valve positioning.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986 (see reference 18 in Appendix C and section 5.3.6 (f)(2)), to provide fixed suppression. The exemption credits the substantial barrier provided by the wall and the distance between credited components on either side. Subsequently, the barrier was evaluated and determined to be adequate for the fire hazard.

(4) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C and section 5.3.46.(f)(1)) for the lack of fire seals in two duct chases located in the floor of elevation 135'-0" in the emergency switchgear rooms. The basis for the exemption was the low combustible loading and the existing fire protection features.

(5) An exemption from the requirements of Appendix R, Section III.F was granted by the NRC in the SER dated August 18, 2000 for the lack of fire detection in fire zones: 50-78A (rooms 414 and 457), 50-78B (rooms 135, 184, 185, 228, 229, and 274), 50-78V(rooms 181 and 272), 50-78W (rooms 22, 138, and 223), 50-78EE (room 177), 50-88 (room 139), and 50-89 (room 179). The bases for the approval of the exemption request in these areas fall into two groups. For fire zone 50-78EE, unit 3 steam air ejector room, the bases sited by the exemption request for approval was minimal access to the room (locked high radiation room), low combustible loading, and the location of redundant shutdown features (to those located in this zone) outside the fire zone. For the remaining zones, the bases was existing automatic suppression systems installed within the zones and the separation of required post-fire safe shutdown functions to other fire areas.

(6) An exemption from the requirements of Appendix R, Section III.F was granted by the NRC in a Safety Evaluation Report dated December 7, 2001 for the lack of fire detection in fire zones 50-78B, (Elevation 165' Common Area Turbine Building) and 50-99, (Unit 2 Feedwater Heater Room, elevation 135'). The basis for the approval of the exemption request for these fire zones is provided for each zone separately. For Zone 50-78B, Room 429, the exemption approval is based on the spatial separation of the conduits of interest to the significant in-situ fire hazards of over 30 feet, as well as high ceilings. For zone 50-99, Room 222, the exemption approval is based on minimal access (locked high radiation area), the use of fire resistive cables and the addition of the cable tray covers to the ceiling.

(7) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

(8) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated

March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

5.3.41 Fire Area 51: Emergency Cooling Towers; Platform (Elev. 125'-0"); Switchgear Rooms, Cooling Water Pump Room (Elev. 153'-0")

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	none
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete (exterior wall)	none
	W - Reinforced concrete	none
Floor:	Reinforced concrete	none
Ceiling:	Lightweight concrete roofing	none
Access:	Door connecting to stairway no. 1 Door connecting to cooling tower fan rooms	

(b) Major Components in Fire Area

0AK32	Emerg Cooling Tower Fan
0BK32	Emerg Cooling Tower Fan
0CK32	Emerg Cooling Tower Fan
MCC00B97	Emerg Cooling Tower Motor Control Center
MCC00B98	Emerg Cooling Tower Motor Control Center
MCC00B99	Emerg Cooling Tower Motor Control Center
MCC00B96	Emerg Cooling Tower Motor Load Center
MCC00B95	Emerg Cooling Tower Motor Load Center
MCC00B94	Emerg Cooling Tower Motor Load Center
00P186	Emerg Cooling Water Pump

MO-0841	Emerg Cooling Water Pump Discharge
MO-501A	ESW Disch to Reservoir
MO-501B	ESW Disch to Reservoir
MO-501C	ESW Disch to Reservoir
MO-502A	HPSW Disch to Reservoir
MO-502B	HPSW Disch to Reservoir
MO-502C	HPSW Disch to Reservoir
MO-2804A	Reservoir Flow to Pump Bay
MO-2804B	Reservoir Flow to Pump Bay
MO-3804A	Reservoir Flow to Pump Bay
MO-3804B	Reservoir Flow to Pump Bay

(c) Postulated Fire in Area

Lube oil leaking from the cooling water pump with subsequent ignition of oil in pump room. No fixed combustibles in remaining rooms, so origin of fire is indeterminate.

(d) Consequence of Fire with Active Fire Suppression

The heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 51 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Units 2 and 3 are related to equipment with redundant components not affected by a fire in this area. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Units 2 and 3 has redundant components that are not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 51, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption to Section III.F of Appendix R was granted by the NRC in the SER dated November 14, 1986, for lack of automatic fire detection into the emergency cooling tower stairway. There are no fixed combustibles located in the area. Entrance into the stairway is controlled by a locked fence gate. The only safety-related equipment is cable in conduit.

5.3.42 Fire Area 52: Unit 3 - North Circulating Water Pump Structure Bay (Elev. 112'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Precast concrete panels (exterior wall)	none
	E - Precast concrete panels (exterior wall)	none
	S - Reinforced concrete	3-hr
	W - Precast concrete panels (exterior wall)	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Metal deck, nonreinforced concrete and built-up roofing	none
Access:	Door connecting to fire area 47 Two doors exiting building	

(b) Major Components in Fire Area

3AP002 Circulating Water Pump

3BP002 Circulating Water Pump

3CP002 Circulating Water Pump

(c) Postulated Fire in Area

Lube oil from the circulating water pumps leaking onto the floor with subsequent ignition of the oil.

(d) Consequence of Fire with Active Fire Suppression

The heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. Upon receipt of the alarm in the control room, the plant fire brigade will be dispatched to extinguish the fire.

(e) Effect of Fire on Safe Shutdown

Fire Area 52 contains safe shutdown cables but does not contain safe shutdown equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Units 2 and 3 are related to equipment with redundant components not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 52, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

5.3.43 Fire Area 53: Unit 2 - South Circulating Water Pump Structure Bay Diesel Fire Pump Room (Elev. 112'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Reinforced concrete	3-hr
	N	- Concrete masonry units (part in zone 145)	2-hr
	E	- Precast concrete panels (exterior wall)	none
	S	- Precast concrete panels (exterior wall)	none
	W	- Precast concrete panels (exterior wall)	none
	W	- Concrete masonry units	2-hr
Floor:		Reinforced concrete foundation mat	none
Ceiling:		Metal deck, nonreinforced concrete and	none

built-up roofing

Access: Door connecting to fire area 48
Two doors exiting building

(b) Major Components in Fire Area

00P064	Diesel Driven Fire Pump
2AP002	Circulating Water Pump
2BP002	Circulating Water Pump
2CP002	Circulating Water Pump

(c) Postulated Fire in Area

(1) Lube oil from the circulating water pumps leaking onto the floor with subsequent ignition of the oil.

(2) Fuel oil in the pump room spilling onto the floor with subsequent ignition.

(d) Consequence of Fire with Active Fire Suppression

The heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room. Upon receipt of the alarm in the control room, the plant fire brigade will be dispatched to extinguish the fire. In the pump room, heat will melt the fusible link on the affected wet pipe sprinkler heads at a predetermined temperature, causing the sprinkler heads to open and extinguish the fire.

(e) Effect of Fire on Safe Shutdown

Fire Area 53 contains safe shutdown cables but does not contain safe shutdown equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Units 2 and 3 are related to equipment with redundant components not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 53, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

5.3.44 Fire Area 54: Diesel Generator Building Cardox Room (Elev. 127'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	E - Reinforced concrete (exterior wall)	none
	S - Reinforced concrete (exterior wall)	none
	W - Reinforced concrete (exterior wall)	none
Floor:	Reinforced concrete foundation mat	none
Ceiling:	Nonreinforced concrete and built-up roofing	none
Access:	Two doors exiting building Door connecting to fire area 46	

(b) Major Components in Fire Area

0AP163	Emergency Service Water Booster Pump
0BP163	Emergency Service Water Booster Pump
MO-0498	ESW Discharge Valve
MO-2486	HPSW Discharge to Reservoir
MO-2803	HPSW Discharge to Reservoir
MO-3486	HPSW Discharge to Reservoir
MO-3803	HPSW Discharge to Reservoir

(c) Postulated Fire in Area

Lube oil from the emergency cooling tower booster pumps leaking onto the floor with subsequent ignition of the oil.

(d) Consequence of Fire with Active Fire Suppression

The smoke generated by a fire will activate smoke detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 54 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Units 2 and 3 are either related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Units 2 and 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 54, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

(1) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

5.3.45 Fire Area 55: Circulating Water Screen Structure (Elev. 116'-0").

(a) Structural and Architectural Design Features of Fire Area

		Construction	Rating
Walls:	N	- Precast concrete panels (exterior wall)	none
	E	- Reinforced concrete, precast concrete panels (exterior wall)	none
	S	- Precast concrete panels (exterior wall)	none
	W	- Reinforced concrete, precast concrete panels (exterior wall)	none

Floor:	Reinforced concrete foundation mat	none
Ceiling:	Metal deck, nonreinforced concrete and built-up roofing	none
Access:	Four doors exiting building	

(b) Major Components in Fire Area

MO-2233A Sluice Gate

MO-2233B Sluice Gate

MO-3233A Sluice Gate

MO-3233B Sluice Gate

(c) Postulated Fire in Area

Lubricating grease which has been ignited by an external source.

(d) Consequence of Fire with Active Fire Suppression

Heat generated by a fire will activate heat detectors which will cause an audible-visual alarm annunciation at the fire alarm annunciator in the main control room.

(e) Effect of Fire on Safe Shutdown

Fire Area 55 contains safe shutdown cables and equipment.

Cables located in this area that are associated with shutdown methods A, B, and C for Units 2 and 3 are associated with equipment that has redundant components not affected by a fire in this area. Equipment located in this area that is associated with shutdown methods A, B, and C for Units 2 and 3 has redundant components not affected by a fire in this area.

Offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses is not affected by a fire in this area.

Therefore, for a fire in Fire Area 55, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

5.3.46 Fire Area 57: Switchgear Corridor, Room 262 (Elevation 135'-0").

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	S - Reinforced concrete	3-hr
	E - Concrete Masonry see 5.3.46.(f)(4)	2-hr
	W - Reinforced Concrete	3-hr
Floor:	Reinforced concrete see 5.3.46.(f)(3)	3-hr
Ceiling:	Reinforced concrete see 5.3.46.(f)(3)	3-hr
Access:	Door connecting to fire area 2	
	Door connecting to fire area 4	
	Door connecting to fire area 31	
	Door connecting to fire area 32	
	Door connecting to fire area 34	
	Door connecting to fire area 36	
	Door connecting to fire area 38	
	Door connecting to fire area 41	
	2 doors connecting to fire area 50	
	Door connecting to fire area 58	

(b) Major Components in Fire Area

None

(c) Postulated Fire in Area

Ignition of electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is self-extinguishing). The area is designated as a "transient combustible free zone" as a result of the IPEEE fire risk analysis (see reference 22 in Appendix C) which further limits the potential for introducing combustibles into the area.

(d) Consequence of Fire with Active Fire Suppression

Smoke generated by a fire will be detected by smoke detectors located in the room which will cause an audible-visual alarm in the main control room. The smoke detectors also provide a permissive signal to the releasing panel supporting the pre-action sprinkler system in the room. The permissive signal from the smoke detectors in conjunction with a sprinkler fusing actuates the deluge valve and admits water to the piping to control the fire. The system can also be manually actuated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 57 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown method C for Units 2 and 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown method C for Units 2 and 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 and 00A020 emergency auxiliary buses may be affected by a fire in this area.

Therefore, for a fire in Fire Area 57, shutdown method C will be available to safely shut down Units 2 and 3.

(f) Exemption Requests and Evaluations

NOTE: Prior to October 1999, Fire Area 57 was part of Fire Area 02. It has been separated from Fire Area 02 by upgrading barriers.

(1) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C and section 5.3.40.(f)(4)) for the lack of fire seals in two duct chases located in the floor of elevation 135'-0" in the emergency switchgear rooms. The basis for the

exemption was the low combustible loading and existing fire protection features.

(2) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the 2 hour rated block walls on the East side of the fire area. The basis credits low combustible loading.

(3) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated March 13, 1985 (see reference 19 in Appendix C) to allow a single 1.5-hour fire damper in lieu of a 3-hour-rated damper in the west wall of the emergency switchgear duct chase. Early warning detection is provided. Combustible loading is low.

(4) An exemption from the requirements of Appendix R, section III.G.2 was granted by the NRC in the SER dated December 31, 1986 (see reference 18 in Appendix C) for two 1.5-hour-rated dampers in series in lieu of one 3-hour-rated damper in three locations in the emergency switchgear duct chase. Early warning fire detection is provided. Combustible loading is low.

(5) An exemption from the requirements of Appendix R, section III.G.2 was grated by the NRC in the SER dated October 3, 1991 (see reference 20 in Appendix C) for the bus duct penetrating the walls between the corridor and the switchgear rooms, and the corridor and the Unit 2 M-G Set room. The basis credits low combustible loading.

(6) An evaluation was done for the bus duct penetrating the wall between fire areas 02 and 57. The evaluation determined that the barrier is adequate for the fire hazard. The basis credits low combustible loading.

(7) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

5.3.47 Fire Area 58: Unit 3 - M-G Set Room, Room 258

(Elevation 135’-0”).

(a) Structural and Architectural Design Features of Fire Area

	Construction	Rating
Walls:	N - Reinforced concrete	3-hr
	S - Reinforced concrete	3-hr
	E - Reinforced concrete	3-hr
	W - Reinforced concrete	3-hr
Floor:	Reinforced concrete	3-hr
Ceiling:	Reinforced concrete see 5.3.47.(f)(1)	3-hr
Access:	Door connecting to fire area 2 Door connecting to fire area 57	

(b) Major Components in Fire Area

30C04BX	HPCI Alternative Control Station
30H06	Reactor Recirculation M-G Set Hoist
3AC150	Instrument Transfer Cubicle
3AC151	Exciter And Field Breaker Cubicle
3AC152	Voltage Regulator Relay Panel
3AC63	3A M-G Set B Lube Oil Instrument Rack
3AE22	Reactor Recirculation M-G Set A Oil Cooler
3AG02	3A RPS M-G Set
3AG04	3A Reactor Recirculation Pump M-G Set (Abandoned in place per ECR 13-00338, Rev. 0)
3AS331	Radiation Monitor For HPSW
3BC150	Instrument Transfer Cubicle
3BC151	Exciter And Field Breaker Cubicle
3BC152	Voltage Regulator Relay Panel
3BC63	3B M-G Set B Lube Oil Instrument Rack
3BE22	Reactor Recirculation M-G Set B Oil Cooler
3BG02	3B RPS M-G Set
3BG04	3B Reactor Recirculation Pump M-G Set (Abandoned in place per ECR 13-000338, Rev. 0)
3BS331	Radiation Monitor For HPSW
DPI3-10-179	RHR/HPSW Differential Pressure Indicator
FI3-10-177	HPSW Flow Indicator
FI3-10-178	RHR Flow Indicator
FI3-23-141	HPCI Flow Indicator
LI3-2-3-112	Reactor Water Level Indicator

LI-9456	Suppression Pool Water Level Indicator
LI-9459	Condensate Storage Tank Water Level Indicator
MCC30B324	480 Vac Motor Control Center Remote Starter
MCC30B325	480 Vac Motor Control Center Remote Starter
MCC30B338	MCC for Valve MO3-10-016A
PI3-23-142	HPCI Pump Discharge Pressure Indicator
PI3-2-3-60B	Reactor Pressure Indicator
PI-9458	Drywell Pressure Indicator
PI-9466	ESW Pump Discharge Pressure Indicator
SPI-5505X	HPCI Turbine Speed Indicator
TI3-2-320	SRV Discharge Temperature Indicator
TI-9455	Drywell Temperature Indicator
TI-9457	Suppression Pool Temperature Indicator

(c) Postulated Fire in Area

(1) Ignition of exposed electrical cabling in cable trays (an unlikely occurrence in the absence of a fire source external to the cabling since it is self-extinguishing).

(2) Deleted.

(d) Consequence of Fire with Active Fire Suppression

A signal from any smoke detector in the M-G set room will open a deluge valve, thus supplying water under pressure to closed sprinklers located above the M-G sets. A fire under the sprinkler system will cause the sprinklers to fuse and control the fire. The system can be manually activated by the fire brigade to supply water to the sprinklers.

(e) Effect of Fire on Safe Shutdown

Fire Area 58 contains safe shutdown cables and equipment.

Cables located in this fire area that are associated with shutdown methods A, B, and C for Unit 2 and shutdown method C for Unit 3 are either encapsulated by a qualified fire barrier, related to equipment with redundant components not affected by a fire in this area, or related to equipment for which manual operator actions can be taken to recover any functions that could be lost. Equipment located in this fire area that is associated with shutdown methods A, B, and C for Unit 2 and shutdown method C for Unit 3 has redundant components that are not affected by a fire in this area, or manual operator actions can be taken to recover any essential functions that could be lost.

The availability of offsite power to the 4kV switchgear via the 00A019 emergency auxiliary bus is not affected by a fire in this area. Offsite power to the 4kV switchgear via the 00A020 emergency auxiliary bus may be affected by a fire in this area.

Therefore, for a fire in Fire Area 58, shutdown methods A, B, and C will be available to safely shut down Unit 2 and shutdown method C will be available to safely shut down Unit 3.

(f) Exemption Requests and Evaluations

NOTE: Prior to October 1999, Fire Area 58 was part of Fire Area 02. It has been separated from Fire Area 02 by upgrading barriers.

(1) An exemption from Appendix R, Section III.G.2 was granted by the NRC in the SER dated December 31, 1986, for protecting structural steel forming a part of or supporting fire barriers to provide fire resistance equivalent to that required of the barrier. The existing sprinkler system in the M-G set room fire area 58 (formerly 2-12C) provides floor area coverage for an oil fire only. A fire from combustibles other than oil which could adversely affect the steel is not considered credible, since it is unlikely that two supervised doors will be open at once.

(2) ECR-NCR 99-02669 addresses the acceptability of a 1.5 hour rated fire door in the stairwell barrier that separates the M-G set room (fire area 58) from Star tower 25 (fire area 2). The acceptability is based in part on the normal use of 1.5 hour rated doors in stair towers.

(3) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated January 30, 2009. This exemption approved post fire operator manual actions that had been previously approved by the NRC in Fire Protection Safety Evaluation reports that were not originally part of the exemption request process. This process is addressed in RIS 2006-10.

(4) An exemption from the requirements of Appendix R, Section III.G.2 was granted by the NRC in a letter dated March 30, 2011. This exemption approved post fire operator manual actions that were not previously addressed in NRC approved Fire Protection Safety Evaluation Reports. The need to request this exemption is addressed in RIS 2006-10.

CHAPTER 6

SPECIAL TOPICS

6.1 ANALYSIS OF ASSOCIATED CIRCUITS

Generic Letter 81-12, issued by the NRC on February 20, 1981, provided guidance for the reassessment of the plant's fire protection features for compliance with 10 CFR 50, Appendix R, Section III.G. One of the enclosures to Generic Letter 81-12 addressed the subject of associated circuits and the possibility that fire-induced damage to associated circuits could prevent operation or cause maloperation of the shutdown methods designated to be used in the event of a fire in the plant. Subsequently, on March 22, 1982, the NRC issued a memorandum to provide additional clarification on the staff's requirements. This clarification memorandum further defined associated circuits of concern as those cables (either safety-related or nonsafety-related) that have a physical separation from the equipment and cables of the redundant safe shutdown methods that is less than that required by Section III.G.2 of Appendix R and also have any of the following:

a. A common power source with the shutdown equipment, and the power source is not electrically protected from the circuit of concern by coordinated breakers, fuses, or similar devices.

b. A connection to circuits of equipment whose spurious operation would adversely affect the shutdown capability.

c. A common enclosure with the shutdown cables, and

   - are not electrically protected by circuit breakers, fuses or similar devices (Type 1), or

   - will allow propagation of the fire into the common enclosure (Type 2).

In accordance with guidance contained in Generic Letter 81-12, an analysis has been performed for Peach Bottom to verify that fire-induced damage to associated circuits will not jeopardize the plant's safe shutdown capability. This analysis utilizes a systems approach, wherein the features of circuit design, such as overcurrent protection, are evaluated together with cable routing and separation criteria in order to confirm the adequacy of the electrical system design to prevent fire-induced damage to non-safe shutdown circuits from jeopardizing safe shutdown capability. This

methodology and results of the analysis are summarized in the following sections.

6.1.1 Associated Circuits Involving Common Power Sources

Power delivery to electrical systems and components that are relied on for post-fire safe shutdown and associated circuits is provided by the Class 1E AC distribution system or the Class 1E DC distribution system. The source of power may be the Onsite Class 1E standby power supplies or the Offsite non-Class 1E power supplies feeding Class 1E buses via the non-Class 1E 13kV distribution system, as described hereinafter. Individual Class 1E and non-Class 1E circuits that are fed by Class 1E power distribution systems are protected by coordinated, Class 1E, fault-actuated protective devices. PBAPS actively maintains coordination studies that use protective device time-current characteristic curves to demonstrate coordination exists between protective devices. These time-current characteristic curves are typical for each type of protective device and application that is represented. The time-current characteristic curves show that for each voltage level, the individual circuit breakers or fuses will clear a fault prior to the operation of the source breaker or fuse protecting the source bus. Consequently, the coordinated, fault-actuated protective devices will act to isolate the circuit with a fire-induced fault without jeopardizing the availability of other circuits connected to the same power source. The coordination study calculations also evaluate exceptions to coordination and conclude that the exceptions do not adversely impact the PBAPS post-fire safe shutdown capabilities.

Non-Class 1E Offsite power delivered via non-Class 1E onsite 13kV distribution circuits may be credited as the power supply for the Class 1E AC distribution system for fire areas that do not require Alternative Shutdown and for which the circuits from the offsite source(s) to the 4kv switchgear are not affected by fire damage. Coordinated, fault-actuated protective devices protect individual Class 1E circuits energized from non-Class 1E power supply systems. Coordinated, fault-actuated protective devices protect individual Class 1E circuits energized from non-Class 1E power supply systems. Coordinated, fault-actuated protective over-current devices protect individual 230kV and 13kV non-Class 1E, off-site startup circuits from the 230kV substation to the Class 1E 4kV distribution system.

Because of the use of coordinated, fault-actuated protective devices as described above, Peach Bottom does not have a concern with associated circuits involving common power sources, as defined by Generic Letter 81-12.

Generic Letter 86-10, Question 5.3.8, addresses the effect of fire induced high impedance faults on the source protection of a common power source. When the high impedance fault phenomenon occurs simultaneously on associated non-safe shutdown circuits, the combined total current generated may be sufficient to trip the source overcurrent protection for the bus, thereby removing power from the shutdown loads.

Peach Bottom actively maintains a multiple high impedance fault calculation to determine if fire-induced, multiple high impedance faults could cause the loss of any power source which supplies safe shutdown loads and is needed for the specific shutdown method(s) relied upon for a given fire. The results and conclusions derived in this calculation are considered in the individual fire area analyses. The multiple high impedance fault calculation and the associated fire area analyses demonstrate that the PBAPS post-fire safe shutdown capability for both units will not be jeopardized due to fire-induced multiple high impedance faults.

6.1.2 Associated Circuits Involving Spurious Operation

Components whose spurious operation could adversely affect the shutdown capability are considered to be essential for safe shutdown of the plant. These components, and the circuits that could cause their spurious operation, are therefore treated as safe shutdown components.

Additionally, circuits whose failure could adversely affect the shutdown capability are considered to be safe shutdown circuits. These circuits include both those whose failure could prevent operation of a safe shutdown component or those whose failure could cause operation under an undesired condition or mode of operation. The safe shutdown analysis, as presented in Chapter 5, demonstrates that at least one method of safe shutdown remains available to shut the plant down in the event of a fire.

Because of the design and analysis approach described above, Peach Bottom does not have a concern with associated circuits involving spurious operation, as defined by Generic Letter 81-12.

6.1.3 Associated Circuits Involving Common Enclosures and Raceways

Separation between the different divisions of Class 1E circuits and between Class 1E and non-Class 1E circuits is discussed in UFSAR Section 7.1.6. Class 1E cables are only routed in raceways

designated as Class 1E. With exceptions, such as certain process and diagnostic instrumentation and the components of the offsite power sources to the 4kV emergency buses, the majority of safe shutdown components are Class 1E equipment. Non-Class 1E circuits, designated as associated circuits in accordance with IEEE Standard 384, may be routed in one channel of Class 1E raceways. Non-Class 1E cables identified and treated as Class 1E do not become associated with other Class 1E channels. The potential for propagation of an electrical fire in enclosures (either raceways or panels) containing Class 1E cables is minimized by the selection of appropriate cable construction systems and by the provision of physical separation. Insulation and jacketing materials used in both Class 1E and non-Class 1E cables are flame retardant.

As discussed in Section 6.1.1, circuits relied on for post-fire safe shutdown and their associated circuits are energized from Class 1E power supply systems and individually protected by coordinated, fault-actuated protective devices. In addition, circuits energized from non-Class 1E power supply systems (offsite sources and onsite 13kV distribution system) are individually protected by coordinated, fault-actuated protective devices. This protection ensures that faulted circuits in common enclosures will be isolated, and faults will not propagate outside of the fire area of concern.

Because of the provisions described above for preventing fire propagation and for isolating circuit faults in common enclosures, Peach Bottom does not have associated circuits involving common enclosures, as defined by Generic Letter 81-12.

6.1.4 Summary

For the reasons discussed in the preceding sections, Peach Bottom does not have a concern with associated circuits in any of the three categories established by Generic Letter 81-12. Therefore, fire-induced damage to circuits that are not designated as necessary for safe shutdown will not affect the operability of any of the safe shutdown methods described in Section 5.2.2.

6.2 ANALYSIS OF HIGH/LOW PRESSURE INTERFACES

Generic Letter 81-12, issued by the NRC on February 20, 1981, discussed the type of information that the NRC considers necessary for the completion of its reviews of safe shutdown capability in the event of a fire. One of the enclosures to Generic Letter 81-12 addressed the subject of interfaces between high pressure and low pressure systems. The NRC's concern involves the valves that serve to isolate low pressure systems from the high pressure reactor coolant system. For situations in which the isolation valves at a given interface point consist of two electrically controlled valves in series, the potential may exist for a single fire to cause damage to cables associated with both valves, depending on the routing of the cables. If the damage causes spurious opening of both valves, the result may be a fire-induced LOCA through the high/low pressure system interface.

A review of the Peach Bottom design was performed to verify that a high/low pressure interface LOCA cannot be caused by a single fire. Each system that includes connections to the high pressure reactor coolant system was reviewed to locate the specific high/low pressure interface points, identify the valves that provide isolation at the interface points, and assess the susceptibility of the valves to simultaneous opening due to fire-caused damage. Table A-5 identifies each such high/low pressure interface and lists the valves at the interface point. Comments in the "Remarks" column of the table identify the service of each high/low pressure interface, and indicates the susceptibility of and effect from each interface, assuming that a single fire could damage cables associated with both the upstream and downstream valves. It should be noted that Table A-5 is applicable to both Unit 2 and Unit 3, and that the unit numbers have been omitted from the valve designations.

6.3 ANALYSIS OF THE YARD

The Yard contains Safe Shutdown Cables and Equipment associated with the Emergency Diesel Generators, Emergency Service Water System, High Pressure Service Water System, Process Instrumentation, and the Offsite Power System. This equipment is located within the site boundary, outside of plant structures, and in manhole installations. A Fire Safe Shutdown analysis has been performed, demonstrating Safe Shutdown capability for a postulated fire in the Yard.

Manholes 25 and 26 are located on the eastern side of the road running between the circulating water pump structure and the administration building. They are each located approximately 12 feet west of the circulating water pump structure and approximately 40 feet from each other. Transformers along the outside of the west wall of the circulating water pump structure come to within 5 feet of the manholes. The fill connection for the diesel fuel oil storage tank of the diesel fire pump is located midway between manholes 25 and 26. The area immediately west of the manholes is the driveway between the administration building and the pump structure. The areas on the other three sides of the manholes are covered with stone. Each manhole is subdivided into four compartments that provide separation between redundant safety-related components. The manholes are protected from intrusion of combustible liquid by raised curbing. In addition, manhole covers are seated on gaskets and penetrations between compartments are sealed with silicone elastomer. Therefore, no fire is postulated that is capable of affecting more than a single compartment. The locations of these manholes are shown in Figure B-3.

The Manhole 25 contains cable associated with shutdown methods A, B, and C for Unit 2 and Unit 3:

Compartment 1 contains SSD cables associated with HPSW valves MO-2344, MO-2233A, MO-2233B, MO-3233B, pressure indication for HPSW pumps 2AP42 and 2CP42, and the main power cable for MCC00B62. Compartment 2 contains SSD cables associated with ESW Pump 0AP57 and HPSW Pumps 2BP42 and 2DP42. Compartment 3 contains SSD cables associated with ESW Pump 0BP57 and HPSW Pumps 2AP42 and 2CP42. Compartment 4 contains SSD cables associated with pressure indication for ESW Pumps 0AP57 and 0BP57, HPSW Pumps 2BP42 and 2DP42, control of MO-2344 and MO-3233A, and power to MCC00B61. Cables required to support shutdown methods A, B, or C have cables associated with redundant equipment located outside the associated compartment. Therefore, shutdown methods A, B, and C will be available to safely shutdown Units 2 and 3.

Manhole 26 contains cables associated with Unit 3 SSD Methods A, B, and C:

Compartment 1 contains cables associated with HPSW Valve MO-3344 and pressure indication for HPSW Pumps 3AP42 and 3CP42. Compartment 2 contains SSD cables associated with HPSW Pump 3AP42 and 3CP42. Compartment 3 contains SSD cables associated with HPSW Pumps 3BP42 and 3DP42. Compartment 4 contains cables associated with HPSW Valve MO-3344 and pressure indication for Pumps 3BP42 and 3DP42. Cables required to support shutdown methods A, B, or C have cables associated with redundant equipment located outside the associated compartment. Therefore, shutdown methods A, B, and C will be available to safely shutdown Units 2 and 3.

Manholes 16, 17, 18, and 19 are located in the access area between the northern side of the radwaste permanent storage building and the southern side of the Unit 2 turbine building. The manholes are on a line extending east to west approximately 28 feet from the northern side of the radwaste storage building and diesel generator building and 46 feet from the southern side of the Unit 2 turbine building. Manholes 16, 17, and 18 have two round steel covers with gasketing, manhole 19 has one round steel cover. The center of manhole 16 is approximately 30 feet along the line from the east side of the offgas filter building. The center of manhole 17 is approximately 8 feet further east along the line but with only 6 inches physically separating the manholes. The center of manhole 18 is approximately 8 feet east of manhole 17 and physically separated by about 8 inches. The center of manhole 19 is approximately 16 feet east of manhole 18, with a physical separation of approximately 10 feet. The locations of these manholes are shown in Figure B-3.

Manhole 40 is in line with manholes 16, 17, 18, and 19 approximately 8 feet west of manhole 16. Covers for manholes 40, 16, 17, and 18 have been gasketed to prevent the intrusion of combustible liquids. In addition, penetrations between compartments for manholes 16 and 17 have been sealed with silicone elastomer. Manholes 89 and 90 are between the west end of the hydrogen storage facility and the east side of the offgas filter building, approximately 6 feet from the Unit 2 turbine building. Manhole 89 is approximately 3 feet east of the offgas filter building, and manhole 90 is approximately 8 feet east of the offgas building. Both manholes 89 and 90 are west of the hydrogen storage facility. The locations of these manholes are shown in Figure B-3. Manhole 90 is protected from intrusion of combustible liquid by gaskets and sealed openings in the manhole cover. Manhole 92 is located east of the Torus Water Storage Tank.

Manholes 019, 089, and 091 do not contain safe shutdown cables.

Manhole 016 contains cable associated with shutdown methods A, B, and C for Units 2 and 3:

Manhole 016 contains cables associated with control and power for 0AG12, 0DG12, MCC00B53, MCC00B56, Diesel Source Breaker (2-152-1807) to Bus 20A18, Diesel Source Breaker (3-152-1807) to Bus 30A18, and MO-3486. Cables required to support safe shutdown method C have cables associated with redundant equipment located outside the manhole. Therefore, shutdown method C will be available to safely shut down Units 2 and 3.

Manhole 17 contains cables associated with shutdown methods A, B, and C for Units 2 and 3:

Manhole 017 contains power and control cables associated with 0AG12, MCC00B53, Diesel Source Breaker (2-152-1503) to bus 20A15, and Diesel Source Breaker (3-152-1503) to bus 30A15. Cables required to support safe shutdown method C have cables associated with redundant equipment located outside the manhole. Therefore, shutdown method C will be available to safely shut down Units 2 and 3.

Manhole 18 contains power and control cables associated with shutdown methods A, B, and C for Units 2 and 3:

Manhole 018 contains power and control cables associated with control of 0BG12, MCC00B54, Diesel Source Breaker (2-152-1606) to 20A16, and Diesel Source Breaker (3-152-1606) to 30A16. Cables required to support safe shutdown method C have cables associated with redundant equipment located outside the manhole. Therefore, shutdown method C will be available to safely shut down Units 2 and 3.

Manhole 040 contains power and control cables associated with shutdown methods A, B, and C for Units 2 and 3:

Manhole 040 contains cables associated with control of 0CG12, MCC00B55, valve MO-2803, valve MO-2486, Diesel Source Breaker (2-152-1704) to 20A17, and Diesel Source Breaker (3-152-1704) to 30A17. Cables required to support safe shutdown method C have cables associated with redundant equipment located outside the manhole. Therefore, shutdown method C will be available to safely shut down Units 2 and 3.

Manhole 090 contains control cables associated with shutdown methods A, B, and C for Units 2 and 3:

Manhole 090 contains cables associated with HPSW discharge valves MO-2486, MO-2803, MO-3486, and MO-3803. Cables required to support safe shutdown methods A, B, and C have cables associated with redundant equipment located outside the manhole or manual operator actions can be taken to recover any functions that could be lost. Failure of any of these cables would be handled as normal equipment failure. Therefore, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

Manhole 092 contains control cables associated with shutdown methods A, B, and C for Units 2 and 3:

Manhole 092 contains cables associated with HPSW Inlet Valves to ECT Reservoir, MO-0502A and MO-0502B. Cables required to support safe shutdown have cables associated with redundant equipment located outside the manhole. Therefore, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

FSSD cables and equipment are located in the general Yard area in manholes 005, 006, 008, 009, 011, 028, 041, 057, 060, 061, and 064, and in various locations outside of plant structures throughout Yard Fire Area. In addition, four common electro-manual pilot valve cabinets for CO_2 suppression systems are located in the Yard area outside the Fifth Diesel Bay (Fire Area 54).

The general Yard area including manholes 005, 006, 008, 009, 011, 028, 041, 057, 060, 061, and 064, contains cables and equipment associated with shutdown methods A, B, and C for Units 2 and 3:

A fire in the general Yard area including manholes 005, 006, 008, 009, 011, 028, 041, 057, 060, 061, and 064, may impact the Offsite Power System. Cables and equipment required to support safe shutdown have redundant equipment located outside the general Yard area. Safe shut down is demonstrated with the failure of Offsite Power by the use of the Emergency Diesel Generators. Therefore, shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

The area outside Fire Area 54, (Fifth Diesel Bay) contains cables and equipment associated with shutdown methods A, B, and C for Units 2 and 3:

A fire in the area outside Fire Area 54 may impact the Offsite Power System. Additionally, this location contains four electro-

mechanical pilot solenoid valve cabinets (EMPC-1, EMPC-2, EMPC-3, EMPC-4) for the CO_2 suppression systems in Fire Areas 44, 45, 46, and 47 (Emergency Diesel Generator Bays).

The normally de-energized pilot supplies the gas to open the discharge valve for each diesel compartment. The pilot can be operated either electrically or mechanically. Operation of each CO2 system also causes the respective diesel generator to be directly tripped from a system relay. Simultaneous failure of all four pilots is not a credible event. There is normally no power in the pilot cabinets; the solenoid receives power from the hazard control boxes. Fire areas 43, 44, 45, and 46 each contain one hazard control box. To mechanically operate the pilots, a break-glass front must be broken and a lever rotated. Therefore, the location of the four pilot cabinets in a common area does not pose a threat to safe shutdown capability. SSD is demonstrated with the failure of Offsite Power by the use of the Emergency Diesel Generators. Shutdown methods A, B, and C will be available to safely shut down Units 2 and 3.

The Refueling Water Storage Tank and Unit 2 Condensate Storage Tank are located in the Yard, surrounded by a common moat. The moat is of sufficient construction to allow a separate analysis of its enclosed area. The volume of the Refueling Water Storage tank and the volume of the Unit 2 Condensate Storage Tank are both required to support the reactor inventory control in Fire Safe Shutdown Methods A and B for Unit 2 and the RWST is also required to support the reactor inventory control in Fire Safe Shutdown Methods A and B for Unit 3. There is no redundant equipment that is credited to provide the same function for these methods. Therefore, fire-induced damage to the Unit 2 CST would make methods 2A and 28 unavailable in this portion of the Yard and fire-induced damage to the RWST would make Methods 2A, 2B, 3A and 3B unavailable, in this portion of the Yard. However, since the tanks are filled with water, inherently rugged and protected from oil fire hazards by the common moat, fire-induced damage that would prevent them from fulfilling their function is not considered credible. Therefore, Shutdown Methods A, B and C will be available to safely shut down Units 2 and 3 for a fire within the boundaries of the moat.

The Unit 3 Condensate Storage Tank is located in the Yard, surrounded by a concrete moat. The moat is of sufficient construction to allow a separate analysis of its enclosed area. The volume of the Unit 3 Condensate Storage Tank is required to support the reactor inventory control in Fire Safe Shutdown Methods A and B for Unit 3. There is no redundant equipment that

is credited to provide the same function for these methods. Therefore, fire-induced damage to the Unit 3 CST would make Methods 3A and 3B unavailable in this portion of the Yard. However, since the tank is filled with water, inherently rugged and protected from oil fire hazards by the common moat, fire-induced damage that would prevent it from fulfilling its function is not considered credible. Therefore, Shutdown Methods A, B and C will be available to safely shut down Units 3 for a fire within the boundaries of the moat. The Unit 3 CST does not support any fire safe shutdown methods for Unit 2; therefore, Shutdown Methods A, B and C will be available to safely shut down Unit 2 for a fire within the boundaries of the moat.

6.4 INDIVIDUAL PLANT EXAMINATION FOR EXTERNAL EVENTS - INTERNAL FIRES ANALYSIS

In response to GL 88-20 Supplement 4, "Individual Plant Examination for External Events (IPEEE) for Severe Accident Vulnerabilities" Section 4 "Internal Fires Analysis" (see reference 22 in Appendix C) the licensee performed a fire risk analysis. As part of the one-time fire risk analysis, certain, specific enhancements were identified and implemented to ensure an acceptable fire risk profile was achieved. These modifications, administrative controls, and procedure enhancements were implemented to demonstrate that PBAPS risk from fire is acceptable. In the fire protection subject area the enhancements are summarized as follows:

(1) Fire barrier (walls) upgrades
(2) Increased administrative controls on transient combustibles (controls over transient storage under exposed cabling in raceway and in transient free zones)
(3) Automation of a suppression system in the turbine building hatchway area, elevation 116’ and 135’
(4) Increased fire brigade awareness in “higher” relative risk areas of the plant
(5) Procedure guidance for contingency actions to restore additional plant equipment beyond that required for strict Appendix R compliance in certain fire areas.

Through crediting existing plant features and the implementation of the enhancements summarized above, PBAPS has demonstrated an acceptable risk profile.

CHAPTER 7

FIRE PROTECTION REQUIREMENTS

7.1 INTRODUCTION

The fire protection requirements contained in Chapter 7 have been relocated from the Technical Specifications by Technical Specifications Change Request 90-05, which was submitted to the NRC on March 28, 1994. The relocation of the requirements was in accordance with NRC Generic Letters (GL) 86-10 "Implementation of Fire Protection Requirements," and GL 88-12, "Removal of Fire Protection Requirements from Technical Specifications."

These requirements are still mandated by a standard fire protection license condition contained in the Facility Operating Licenses.

Implementation of the requirements will be through the Technical Requirements Manual (TRM). As a result, for the purpose of clarity and consistency the Limiting Conditions for Operations have been termed Technical Requirements Manual Specifications (TRMS) and the Surveillance Requirements have been termed Test Requirements (TR).

7.1.1 Fire Safe Shutdown Equipment Restoration

The majority of equipment analyzed for FSSD is Class 1E and/or governed by Technical Specification operability requirements. A small number of components have been installed or analyzed in response to 10CFR50 Appendix R safe shutdown requirements that are not Class 1E nor governed by Technical Specifications. To provide reasonable assurance of availability, when equipment analyzed for Appendix R safe shutdown is not functional or is indeterminate, troubleshooting, repair and return to service shall be performed on a high priority basis using existing procedures and planning methods.

Sections 7.2, 7.3 and 7.4 have been deleted from the FPP and relocated to the TRM.