ATTACHMENT 3
TO: H. MASSIN

LaSalle County Station Unit 1

Cable Spreading Room Fire Protection System - Spray Test Procedure

1.0 PURPOSE

Spray Test #1 - To determine total water spray density for 25 sq.ft. of cable pan.

Spray Test #2 - To determine water spray density for 1 sq.ft. a distance of 10 ft. from the spray nozzle.

2.0 SCOPE

To verify the design of the Unit 1 Cable Spreading Room Water Spray System.

3.0 PROCEDURE

Waterstops are arranged and the spray nozzle is positioned in accordance with Attachment #1. A 5 in. x 30 in. (width of pan) drain opening is already provided in the cable pan. A water collecting device is temporarily attached to the pan under the drain opening. Water from the collecting device is routed to a calibrated 20 gallon container via flexible hose. A temporary globe valve is installed just upstream of the spray nozzle for regulating water supply pressure to the nozzle. A calibrated pressure gauge (Attachment #2, #PG-89 from Morrison Construction Co.) is also installed at this location.

The system is manually tripped and pressure is regulated to the desired nozzle pressure with the temporary globe valve. After nozzle pressure and water flow in the pan are stabilized, the 20 gallon calibrated container is moved under the drain hose and timed until full.

TEST RESULTS

Spray Test #1:

Trial #1	Nozzle pressure	10 psig.
	Time for 20 gal. fill	2 min. 32 sec.
	Nozzle flow = $\frac{20 \text{ gal.}}{2.53 \text{ min.}}$ = 7.9 GPM	
Trial #2	Nozzle pressure	15 psig.
	Time for 20 gal. fill	2 min. 11 sec.
	Nozzle flow = $\frac{20 \text{ gal.}}{2.18 \text{ min.}}$ = 9.2 GPM	

3.0 PROCEDURE (Cont'd)

TEST RESULTS

Spray Test #1:

Full Nozzle Flow Trial
(all nozzle flow directed to container)

Nozzle pressure	10 psig.
Time for 20 gal. fill	2 min. 12 sec.

Nozzle flow = $\frac{20 \text{ gal.}}{2.20 \text{ min.}}$ = 9.1 GPM

@ 10 psig. nozzle pressure, 87% (7.9GPM/9.1 GPM) of flow is contained by the cable pan.

Spray Test #2:

Nozzle pressure	10 psig.
Time for 20 gal. fill	-------*

* although a light spray was detected, time was not measured since the flow into the container was negligible.

4.0 CONCLUSIONS

Spray Test #1: (total density for 25 sq.ft.)

Spray density = $\frac{7.9 \text{ GPM}}{25 \text{ sq.ft. @ 10 psig. nozzle pressure}}$ = .32 GPM/sq.ft.

Spray Test #2: (density of 1 sq. ft. 10 ft. from nozzle)

A negligible spray density was demonstrated. @ 10 psig. nozzle pressure.

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EEF/dlt

Attachment

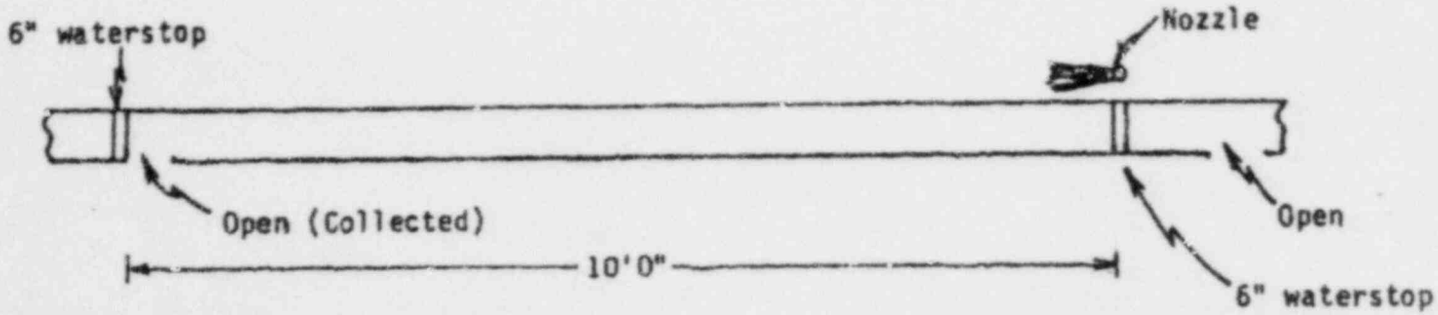
LaSalle County Station Unit 1

Cable Spreading Room Fire Protection Spray Test

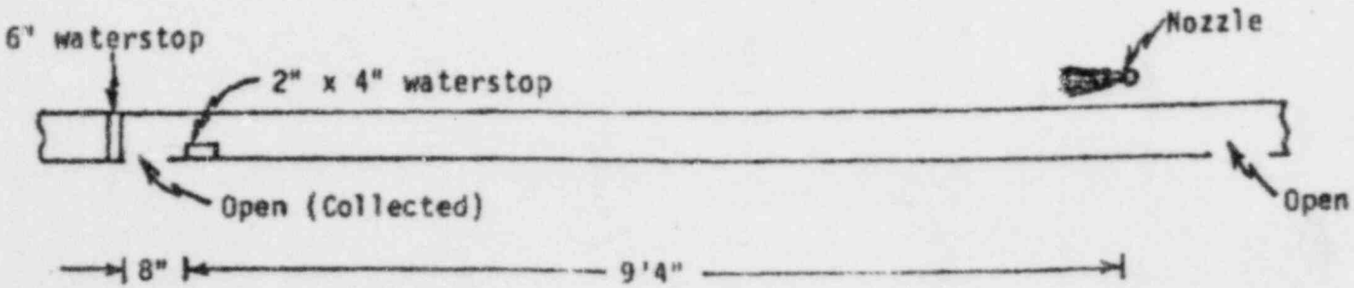
Spray Test #1 - Determines the total water spray density for a 10 ft. length of cable pan.

Spray Test #2 - Determines the density of 1 sq. ft. of cable pan area a distance of 10 sq. ft. from the nozzle.

SPRAY TEST #1



SPRAY TEST #2



ATTACHMENT #1

DATE 11-27-81 FORM NO. PC-61

MCCO ID# of Instrument Tested: PG-89

ATTACHMENT # 2

MCCO ID# of Instrument Standard: 55-031

55-031 READING	PG-89 READING	DEVIATION
5	5	0
10	10	0
15	15	0
20	20	0
25	25	0
30	30	0

Instrument certification was accomplished by use of:

REFER TO AMETEK HANDBOOK FORM 68-23-11/78

Instrument Standard has been calibrated utilizing instruments traceable to the N.B.S. and are certified to be within specified tolerances.

Test Conducted by

Q.C. Acceptance

Witnessed by

H.3 FIRE HAZARDS ANALYSIS

H.3.1 Refueling Floor

H.3.1.1 Refueling Floor - Zone 1

This area consists of one zone only.

Description

The refueling floor is the upper floor of the reactor buildings and is common to both units. The steam dryer and separator storage pools, spent fuel storage pools, and new fuel storage vault are included in this area.

All barrier walls above elevation 843 feet-6 inches are exterior walls consisting of insulated fluted metal siding on steel girts. They are blow-in/blow-out panels with an infiltration/exfiltration criteria of 420 cfm. The only exception is the west wall which has a large portion of structural reinforced concrete block. This 3-hour fire rated wall connects the reactor building to the auxiliary building's roof. There is a nonrated door that leads into an airlock on the auxiliary building's roof.

The floor slab of this fire area is at elevation 843 feet-6 inches and is a minimum of 18-inch thick structural reinforced concrete supported on concrete beams. Thirty-six floor drains are provided. There are numerous hatches covered with removable concrete slabs ranging in thickness from 6 to 40 inches. They have a 1/4-inch steel frame with a 4-inch bearing surface all around.

There are two elevator openings and four stair openings present. Two of the stair openings are open and have no fire rating. The south and east walls of the other two stair openings are 3-hour fire rated. The north and west walls carry a 2-hour-fire rating. The elevator has 3-hour fire rated south and west walls and 2-hour fire rated north and east walls. The elevator walls extend up to within 1 inch of the roof slab. This space is filled with a silicone foam fire seal. Entrance doors to stairs and elevators are UL labeled "B" fire doors with certified frames. UL labeled "A" fire doors separate zones. The elevator shaft has a 2-hour fire rating. Due to the open stairs, the floor slab has no fire rating.

The roof slab of this fire area is at elevation 894 feet-0 inch and is UL Class "A" built-up roofing with 2-inch rigid insulation over 1 1/2-inch metal decking on exposed structural steel beams and girders. There is one roof hatch provided. There are 12 roof drains provided.

The refueling floor is served by both Unit 1 and 2 reactor building ventilation systems. The ventilation air is distributed

Planned Modifications

No modifications are required in this zone.

H.3.2.2 Elevation 820 feet-6 inches - Fire Zone 2B1

Description

All barrier walls of this fire zone are structural reinforced concrete. They are keyed and doweled into the floor and ceiling slab.

The north wall is 36 inches thick and common to fire zone 3B1. There is a UL labeled "A" fire door provided. This wall has a 3-hour fire rating. with a certified frame

The east and south walls have a minimum thickness of 24 inches and are exterior walls. They each have a minimum 3-hour fire ratings.

The west wall is 72 inches thick and has an opening that provides access to zone 2B2 via a passageway. The section of this wall common with the reactor primary containment has a minimum 3-hour fire rating.

The floor slab is at elevation 820 feet-6 inches and is common to fire zone 2D. It is 18-inch thick structural reinforced concrete supported on concrete beams. There is an open stairway in the northeast corner, an equipment hatch, 8-inch thick removable concrete slabs, and openings covered with checkered plates. Seven floor drains are provided.

The ceiling slab of this fire zone is at elevation 843 feet-6 inches and is common to fire area 1. It varies from 18 inch to 54 inch thick structural reinforced concrete supported on concrete beams. There is one stair opening in the northeast corner, sections of 6-inch and 12-inch thick removable concrete slabs, and openings covered with checkered plates.

Due to the open stairs and the openings covered with checkered plates, the floor and ceiling slabs have no fire ratings.

This zone contains the general area at elevation 820 feet-6 inches on the east side of the Unit 1 reactor building. Ventilation air for this zone is supplied from the reactor building ventilation system through ductwork, and exhausted into the holding pump cubicles located in fire zone 2B2. The temperature within this zone is maintained between 65° F and 104° F.

The reactor building ventilation system is a once-through system comprised of 100% outdoor air. The air is exhausted via the main

credible fire to a single division. The standby gas treatment system located in the Unit 2 reactor building serves as a backup to the Unit 1 system. A deluge system is provided to extinguish a fire in the standby gas treatment system.

Planned Modifications

No modifications are required in this zone.

H.3.2.3 Elevation 820 feet-6 inches - Fire Zone 2B2

Description

All barrier walls of this fire zone are structural reinforced concrete that are keyed and doweled into the floor and ceiling slabs.

The north wall is 36 inches thick and common to fire zone 3B2. There is a UL labeled "A" fire door provided in this wall. This wall has a 3-hour fire rating. ↑ with a certified frame

The east wall is 72 inches thick and has an opening that provides access to fire zone 2B1 via a passageway. The section of this wall common with the reactor primary containment has a minimum 3-hour fire rating.

The south wall is an exterior wall with a 24-inch minimum thickness. This wall has a minimum 3-hour fire rating.

The west wall has a minimum thickness of 24 inches and is common to fire zone 4A. The wall has a minimum 3-hour fire rating.

The floor slab of this fire zone common with fire zone 2C, is at elevation 820 feet-6 inches and elevation 823 feet-6 inches. It is 18 inch to 36 inch thick structural reinforced concrete supported on concrete beams. There is an elevator and a stair opening provided in the floor slab. The elevator is enclosed on the north and east by 11 5/8-inch thick concrete block walls that extend up to within 1 inch of the ceiling slab. The south and west walls of this fire zone complete the enclosure. There is an area of 8-inch thick removable concrete slabs and an opening covered with a checkered plate.

The ceiling slab of this zone is common to fire zone 2A and fire area 1 at elevations 832 feet-0 inch and 843 feet-6 inches respectively. The section of the ceiling slab common with fire zone 2A consists of 6-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking supported by exposed steel beams. The ceiling slab common with fire area 1 is 18-inch to 40-inch thick structural reinforced concrete supported by concrete beams. There are concrete removable slabs varying in thickness from 12 inches to 40 inches and openings covered with

Class 2A-20B:C portable fire extinguisher, and one Class 20B:C portable fire extinguisher.

Design-Basis Fire

The design-basis fire would not spread from this zone due to a lack of continuity of combustibles. The physical separation between divisional and divisional associated cables and the lack of an external energy source between them limits the maximum credible fire to a single division.

Planned Modifications

~~No modifications are required in this zone.~~ A fire detection system will be provided for this zone. This system will be engineered and installed prior to first refuelling outage

H.3.2.5 Unit 1 - Elevation 786 feet-6 inches - Fire Zone 2D

Description

All barrier walls of this fire zone are structural reinforced concrete. They are keyed and doweled into the floor and ceiling slabs.

The north wall has a minimum thickness of 36 inches and is common to fire zone 3D. There is one UL labeled "A" fire door located in this wall. This wall has a 3-hour fire rating. with a certified frame

The east and south walls are a 24-inch thick exterior wall. They have a minimum 3-hour fire rating.

The west wall is 36 inches thick and common to fire zone 4B. It has a minimum 3-hour fire rating.

The circular inner wall of this zone is 48-inch thick structural reinforced concrete and is part of the reactor primary containment structure. It has a minimum 3-hour fire rating.

The floor slab of this fire zone is at elevation 786 feet-6 inches and is common to fire zone 2E. The floor slab is 18-inch thick structural reinforced concrete supported on structural concrete beams and walls. There are two sections of 8-inch thick removable concrete slabs, openings covered with checkered plates, and an equipment hatch. There is an elevator and two stair openings. The stairs are open and have no fire rating. The elevator is in the southwest corner of this fire zone. The north and east walls are 11-5/8 inch thick concrete block which extend up to within 1 inch of the steel beam.

The ceiling slab of this zone is at elevation 807 feet-0 inch, elevation 820 feet-6 inches, and elevation 843 feet-6 inches and is common to fire zones 1, and fire zones 2B1 and 2C. It is a minimum of 16-inch thick structural reinforced concrete supported on concrete beams. There are two sections of 44-inch thick

Extinguishing and Detecting Capabilities

Manual fire protection equipment consists of two firehose stations each with 75 feet of 1 1/2-inch UL listed hose, two firehose stations with 50 feet of 1 1/2-inch UL listed hose, three Class 2A-20B:C portable fire extinguishers, and two Class 20B:C portable fire extinguishers. Ionization detectors are provided to annunciate an alarm in the control room.

Design-Basis Fire

The design-basis fire would not spread from this zone due to a lack of continuity of combustibles. The physical separation between divisional and divisional associated cables and the lack of an external energy source between them limits the maximum credible fire to a single division. The physical separation between the containment monitoring panels is such as to minimize the possibility of a fire affecting both panels. The Unit 2 post-LOCA hydrogen recombiner is redundant to Unit 1 and will not be affected by a fire in this zone.

Planned Modifications

No modifications are required in this zone.

H.3.2.6 Unit 1 - Elevation 761 feet-0 inch - Fire Zone 2E

Description

All barrier walls of this fire zone are structural reinforced concrete and are keyed and doweled into the floor and ceiling slabs.

The north wall of this fire zone is common to fire zone 3E and has a minimum thickness of 36 inches. There are two UL labeled "A" fire doors provided in this wall. The wall has a 3-hour rating. ↑ with certified frames

The east and south walls of this fire zone are exterior walls and have a thickness of 24 inches. They both have a minimum 3-hour fire rating.

The west wall of this fire zone is common to fire zones 4C1 and 4C2 and has a minimum thickness of 36 inches. There is one ~~UL~~ 2½" thick steel shielding ~~labeled "A"~~ door provided in this wall. The wall has a 3-hour fire rating.

The circular inner wall of this zone is 48-inch thick structural reinforced concrete and is part of the reactor primary containment. It has a minimum 3-hour fire rating.

The floor slab of this fire zone is at elevation 761 feet-0 inch and is structural reinforced concrete with a minimum thickness of 18 inches supported on concrete beams. There are numerous

Fire Loading

The fire loading for this zone, including a transient fire loading equivalent to 55 gallons of lube oil, is 37,900 Btu/ft^2. This is equivalent to a fire severity of less than 1/2 hour.

Extinguishing and Detecting Capabilities

Manual fire protection equipment consists of four firehose stations with 50 feet each of 1 1/2-inch UL listed hose, two Class 2A-20B:C portable fire extinguishers, and four Class 20B:C portable fire extinguishers. Ionization detectors are provided to detect a fire and annunciate an alarm in the control room.

Design-Basis Fire

The design-basis fire would not spread from this zone due to a lack of continuity of combustibles. The physical separation between divisional and divisional associated cables and the lack of an external energy source between them limits the maximum credible fire to a single division. Physical separation is utilized to minimize the possibility that a fire would not affect both a primary containment atmosphere hydrogen and oxygen monitoring panel and its redundant counterpart.

Planned Modifications

No modifications are required in this zone.

H.3.2.7 Unit 1 - Elevation 740 feet-0 inch - Fire Zone 2F

Description

All barrier walls of this fire zone are structural reinforced concrete and are keyed and doweled into the floor and ceiling slabs.

The north wall of this fire zone, common with fire zone 3F, has a minimum thickness of 36 inches. There is a pair of UL labeled "A" fire doors with a certified frame provided in this wall.

The east and south walls of this fire zone are exterior walls that have a thickness of 24 inches.

The west wall of this fire zone has a minimum thickness of 36 inches.

The walls common with fire zone 2K are 56 inches thick. There is a blast door for access to the main steamline shaft.

The north, south, east, and west walls of this zone all have a minimum 3-hour fire rating.

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Combustible Materials

Combustible materials consist of cable insulation, ventilation seals and gaskets, and a small amount of lube oil.

Fire Loading

The fire loading for this zone, including a transient fire loading equivalent to 55 gallons of lube oil, is 50,100 Btu/ft^2. This is equivalent to a fire severity of slightly greater than 1/2 hour.

Extinguishing and Detecting Capabilities

The ionization detectors sound an alarm in the control room. Manual fire protection equipment consists of five firehose stations with 50 feet each of 1 1/2-inch UL listed hose, two Class 2A-20B:C portable fire extinguishers, and two Class 20B:C portable fire extinguishers.

Design-Basis Fire

The design-basis fire would not spread from this zone due to a lack of continuity of combustibles. The physical separation between divisional and divisional associated cables and the lack of an external energy source between them limits the maximum credible fire to a single division.

Planned Modifications

No modifications are required in this zone.

H.3.2.8 Unit 1 - Elevation 710 feet-6 inches - Fire Zone 2G

Description

All barrier walls of this fire zone are structural reinforced concrete and are keyed and doweled into the floor and ceiling slabs.

The north wall of this fire zone, common with fire zone 3G, has a minimum thickness of 36 inches for access to fire zone zone 3G. There are two pairs of doors forming an airlock. One pair of ~~the airlock doors are~~ has a UL labeled "A" fire door for the active leaf & a certified inactive leaf with a certified frame. The wall has a 3-hour rating.

The east wall is a minimum 24 inches thick. One portion of the wall is common with the off-gas filter building and the other portion is an exterior wall. There is a UL labeled "A" fire door with a certified frame for access to the off-gas filter building fire zone 10A1. Leading to the equipment access airlock is a 21-foot 0-inch high by 14-foot 10-inch wide motor-driven swing door which is required to withstand tornadic winds. The wall has a 3-hour rating.

The south wall is a minimum 24 inches thick. One portion of the wall is common with the turbine building corridor in fire zone 5C11 and the other portion is an exterior wall. There is a ~~[illegible]~~ door for access to the turbine building. ~~[illegible]~~ 2½ inch thick solid steel This shield door is judged consistent with the 3-hour wall rating.

The west wall, common to auxiliary building fire zones 4F1 and 4F3 and the main steamline shaft (fire zone 2K), is a minimum 36 inches thick. For access to fire zone 4F3 there is a ~~[illegible] "A" fire door. The wall has a 3-hour rating.~~

The circular inner walls of this zone are 48 inch thick structural reinforced concrete and are part of the reactor primary containment. 2½ inch thick solid steel door with a rating judged consistent with the 3-hour wall rating

The floor slab at elevation 710 feet-6 inches is a minimum 18-inch thick structural reinforced concrete. In the four outside corners of the zone there are stairwells. The stairwells in the northwest and southeast corners are enclosed with 28-inch concrete shielding block and have a nonrated door. The floors of these two enclosures are metal grating which rests at elevation 712 feet-11-1/4 inches. The tops of the walls extend up to within 1 inch of the ceiling slab. Also in the southwest corner is an elevator hoistway which is enclosed by an 11 5/8-inch thick concrete shielding block wall. The floor slab contains many removable concrete slabs having a minimum thickness of 6 inches. There are eighteen 4-inch floor drains in the floor slab as well as a number of removable checkered steel plates.

The ceiling slab of this area, at elevation 740 feet-0 inch is structural reinforced concrete varying in thickness from 18 inches to 36 inches. There are numerous minimum 6-inch thick removable concrete slabs and an equipment hatch. There are also an elevator and two stair openings.

Due to the open stairs, nonrated elevator, and equipment hatch, the floor and ceiling slabs have no fire ratings.

This zone contains the general area and cubicles at elevation 710 feet-6 inches of the Unit 1 reactor building. Ventilation air is supplied through ductwork, mixed with air from elevation 740 feet-0 inch and then exhausted through the RHR heat exchanger cubicles to the floor below. The temperature is maintained between 65° F and 104° F in the general area, and between 65° F and 122° F in the cubicles.

Safety-Related Equipment

This zone contains two 480-V motor-control centers, the RHR heat exchangers, the [illegible] instrument panels A and B, the reactor recirculation [illegible] panels A and B, the main steam flow instrument panels A and D, and various safety-related cables.

In four of these walls there is a nonrated doors leading to outer fire zones 2H2, 2H3, 2H4, and 2H5. There is one UL labeled "A" door on the north wall for access to fire zone 3H1. The walls common with fire zones 2K, 3H1, 10B1, and the south exterior wall have a minimum 3-hour fire rating.

The major part of the floor, at elevation 694 feet 6 inches, is steel grating, some of which is removable. The remaining floor area is 18-inch and 24-inch thick structural reinforced concrete. There are a number of 6-inch concrete pads for HVAC equipment, and there are two openings for removable concrete slabs along with two ladder access openings going down to elevation 673 feet-4 inches. Also, there are six 4-inch floor drains provided in the floor slab.

The ceiling slab, at elevation 710 feet-6 inches, is the floor slab of fire zone 2G and is a minimum 18-inch thick structural reinforced concrete.

There are numerous openings and grating in the floor and ceiling slabs; because of this, they have no fire rating.

This zone comprises the general area at elevation 694 feet-6 inches of the Unit 1 reactor building. Ventilation air is induced through this zone from areas above and then into the main steam tunnel through the isolation dampers. The temperature is maintained between 65° F and 104° F throughout the zone.

Safety-Related Equipment

This zone contains four CSCS area coolers for cooling the ECCS pump cubicles, and various safety-related cables.

Protection Criteria and Measures

The cable trays for ESF Divisions 1 and 2 are no closer than 50 feet from one another. The north side of this zone contains Division 1 and the southeast side contains Division 2. Divisional or divisional associated cabling is routed in conduit when necessary to preserve the divisional separation. Cable fire stops are used through all zone boundary walls. The four CSCS area coolers are located in the four corners of this zone. Due to the low fire loading, only manual fire protection is provided.

Combustible Materials

The combustible materials in this zone consist of cable insulation and ventilation seals and gaskets.

cables and the lack of an external energy source between them limits the maximum credible fire to a single division.

Planned Modifications

No modifications are required in this zone.

H.3.2.15 Unit 1 HPCS Cubicle - Fire Zone 2I2

Description

This fire zone is enclosed by walls constructed of minimum 24-inch thick structural reinforced concrete. The room is in the shape of a triangle: two walls are at the southwest corner of the Unit 1 reactor building; the third wall is adjacent to fire zone 2I1, and one watertight door leads to zone 2I1. The southwest corner is adjacent to fire zones 6E, 7C6, and 7C5. The south and west walls have a minimum 3-hour rating.

The floor slab at elevation 673 feet-4 inches is 84-inch thick structural reinforced concrete and is the base slab. In the southwest corner there is an elevator hoistway with 11 5/8-inch thick concrete shielding block walls. Next to the elevator, along the south wall, is a stair opening going up to elevation 710 feet-6 inches. Enclosing the stairwell is a 7 5/8-inch thick concrete block wall with one labeled "B" door and a silicone foam fire seal at the top of the wall. This enclosure has a 2-hour fire rating. Along the south wall, adjacent to the stairway, is a sump pit with a steel cover. A strainer pit is also located in the same area. There are two 4-inch drains provided in the floor slab.

with a certified frame

The ceiling slab, at elevation 694 feet-6 inches, is 28 inch thick structural reinforced concrete and is the floor slab of fire zone 2H2. There are numerous openings in the ceiling slab. Because of this, the ceiling slab is not fire rated.

This cubicle communicates with the area above (fire zone 2H2) and is ventilated in a similar manner. Temperatures are maintained between 65° F and 122° F.

Safety-Related Equipment

This zone contains the HPCS pump, the HPCS water leg pump, the HPCS instrumentation panel, and various ESF Division 3 cables.

Protection Criteria and Measures

See Subsection H.3.2.13.

Planned Modifications

No modifications are required in this zone.

H.3.2.21 Unit 1 - Steam Tunnel - Fire Zone 2K

Description

The main steamline shaft, fire zone 2K, extends from elevation 687 feet-0 inch to 768 feet-0 inch.

The walls of this zone are structural reinforced concrete which are keyed and doweled into ceiling slabs. The walls vary in thickness from 18 inches to 54 inches.

At the north portion of the east boundary, at elevation 687 feet-0 inch, there is no wall. At this boundary line which is common with the turbine building, fire zone 5B1, there is no rating.

The north wall, north portion of the east wall, and west portion of the south wall are a minimum 42-inch thick concrete. The walls have a 3-hour rating.

The walls in the southeast area of this zone are common with the turbine building, fire zone 5D1. A section of the walls is 19 5/8-inch thick concrete block which extends up to within 1 inch of the roof slab. The space is filled with a thermafiber fire seal. A portion of the concrete wall which is common to both zones extends up to within 2 inches of the concrete slab. This space is also filled with a thermafiber fire seal. For access to fire zone 5D1 there is a UL labeled "A" fire door. The walls common with zone 5D1 and 5D2 have a 3-hour rating.

The walls of the main steamline shaft as they extend up to elevation 768 feet-0 inch are a minimum 56-inch thick concrete. The walls have a 3-hour rating.

At elevation 736 feet-7 inches, the main steamline shaft east wall is common with the primary containment, fire zone 2J. For access to the reactor building, fire zone 2F, there is a blast door. The walls, at elevation 736 feet-7 inches, have a 3-hour rating.

All floor and ceiling slabs are structural reinforced concrete. At elevation 687 feet-0 inch the floor slab varies from 36 inches to 60 inches in thickness. At elevation 736 feet-7 inches the slab is 56 inches thick.

The ceiling slab of the east area next to the primary containment varies from elevation 758 feet-7 inches to 761 feet-0 inch. The slab is 56 inches thick. There are numerous removable slabs which are 27 inches thick. The ceiling slab of the west area

H.3.4 Fire Area 4: Auxiliary Building - Units 1 and 2

The auxiliary building is common to Units 1 and 2. It has been divided into 19 zones for the purpose of the fire hazards analysis. These zones are listed in Table H.2-1 and shown in Figure H.2-1. Each zone is discussed in the following. The entire building structure is constructed of protected, noncombustible materials. Table H.3-1 lists the safety-related and radioactive equipment combined within each zone, and Table H.3-2 summarizes the combustible hazards and fire fighting capabilities present.

H.3.4.1 Auxiliary Building Upper Ventilation Equipment Floor - Fire Zone 4A

Description

The west wall of this zone is an interior wall that is common to the turbine building. This wall is composed of 18-inch thick concrete that contains protected structural steel framing. There is an offset portion of the wall between column lines 14 and 16 which is supported by protected structural steel and contains two UL labeled "A" fire doors, with certified frames. The west wall qualifies as a 3-hour fire barrier.

The south wall of this zone has two parts, one exterior portion along column line 6 between rows R and N, and another exterior portion above the Unit 1 diesel-generator room roof along column line 9 between rows N and J. Both portions are composed of 18-inch thick concrete with protected structural steel framing on the inside face of the wall. Both walls qualify as 3-hour fire barriers from external exposures and 1-hour fire barriers from internal exposures.

The east wall of this zone has three parts. The first part is an external wall above the Unit 1 diesel-generator room roof along row N between column lines 6 and 9. The second portion is common to the reactor buildings and lies along row J between column lines 9 and 21. The third portion of the wall is an exterior wall above the Unit 2 diesel-generator room along row N between column lines 21 and 24. The first and third portions are composed of 18-inch thick concrete with protected structural steel on the inside face. The second portion is composed of self-supporting structural concrete at least 36 inches thick. The first and third portions of the wall qualify for a minimum 3-hour rating from external exposure, and a 1-hour fire rating from internal exposures. The second portion of the wall qualified as a 3-hour fire barrier.

The north wall of this zone has two parts; one exterior wall along column line 24 between rows R and N, and another exterior wall above the Unit 2 diesel-generator room roof along column line 21 between rows N and J. Both portions are composed of

Planned Modifications

No modifications are required in this zone.

H.3.4.4 Auxiliary Building Main Floor - Fire Zone 4C2

Description

All four walls of this zone are structural reinforced concrete with the exception of a small section of the west wall consisting of hollow concrete block. The structural reinforced concrete walls are all keyed and doweled into the roof slab.

The north wall, which is common with the control room (fire zone 4C1), is 24 inches thick. There is one UL labeled "A" (3-hour rated) fire door in the wall.

The east wall, which is common with the Unit 1 reactor building (fire zone 2E), is a minimum 36 inches thick. There is one ~~labeled "A" (3 hour rated) fire~~ door in the wall. ~~2½" thick solid steel shield~~ The shield door is judged consistent with the 3-hour wall rating.

The south wall, which is an exterior wall, is 24 inches thick with no access openings. The columns have a minimum 3-hour rating.

The section of the west wall common with the turbine driven reactor feed pump area (fire zone 5A1) is 48 inches thick with no access openings. The columns have a minimum 3-hour rating. The section of this wall common with fire zones 5A5 and 4C4 is 11 5/8-inch hollow concrete block which extends up to within 1 inch of the ceiling slab. The 1-inch space is filled with a silicone foam fire seal. There are two access openings with UL labeled "A" (3-hour rated) fire doors. All walls have a 3-hour fire rating.

The floor slab of this zone, which is also the ceiling slab of the fire zone 4D3, is at elevation 768 feet-0 inch. It consists of 6-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking. The only exception is between column lines 11 and 12 where there is 36-inch thick concrete with no decking. The entire floor slab is supported by 2-hour fire protected steel beams and columns. In the north area of this zone the beams and columns required for structural support of the control room floor (fire zone 4C1) are fire protected and have a fire rating of 3 hours. The floor slab has a 2-hour fire rating. There are seven floor drains. Many rooms have the floor covered with vinyl asbestos tile and have a 4-inch vinyl cove base around the walls.

The ceiling slab of this room, which is also the floor slab of fire zone 4B, is at elevation 786 feet-6 inches. It consists of 24-inch thick structural reinforced concrete supported by protected steel beams and columns. In the north area of this

Fire Loading

The average fire loading for this zone, including a transient loading equivalent to 55 gallons of lubricating oil, is 38,800 Btu/ft^2. This is equivalent to a fire severity of approximately 1/2 hour.

Extinguishing and Detecting Capabilities

An ionization detector is provided in the ductwork. Actuation of the detector sounds an alarm in the control room and stops the fans. Manual firefighting equipment consists of one firehose station with 50 feet of 1 1/2-inch UL listed hose, one firehose station with 75 feet of 1 1/2-inch UL listed hose, one CO_2 hose reel with 100 feet of UL listed hose, two Class 2A-20B:C portable extinguishers, and two Class 20B:C portable extinguishers.

Design-Basis Fire

The design-basis fire would be contained within this zone and have no effect on safety-related equipment.

Planned Modifications

~~No modifications are required in this zone~~ A fire detection system will be provided for this zone. This system will be engineered and installed prior to first refuelling outage.

H.3.4.5 Auxiliary Building Elevation 768 feet-8 inches - Fire Zone 4C3

Description

This zone, being an irregular space, will have the walls described going around the room clockwise starting at the north wall.

The north wall is an exterior wall. It is 24-inch thick structural reinforced concrete doweled and keyed into the ceiling slab. The columns have a 3-hour rating.

The east wall, common with the reactor building (fire zone 3E) is 18-inch thick structural reinforced concrete doweled and keyed into the roof slab. ~~In the stairwell area there is one UL labeled "A" (3-hour rated) fire door for access to the reactor building.~~ There is one 2½" thick solid steel shield door in the wall with a rating judged consistent with the wall rating.

The south wall, which is common to the control room (fire zone 4C1) is 24-inch thick structural reinforced concrete doweled and keyed into the ceiling slab. There is one UL labeled "A" (3-hour rated) fire door in this wall.

The west section of the south wall is common with the security control center (fire zone 4C5). Fire zones 4C3 and 4C5 have three walls in common. These walls are 11 5/8-inch thick hollow

concrete block extending up to within 1 inch of the metal decking. The 1-inch space is filled with a silicone foam fire seal.

The east wall then extends back to a wall common with the control room (fire zone 4C1). This wall is 18-inch thick structural reinforced concrete. In this section of the wall there is a pair of UL labeled "A" (3-hour rated) fire doors.

The south wall, common with the computer storage room (fire zone 4C4) is 11 5/8-inch thick hollow concrete block with a silicone foam fire seal at the top. Located in this wall is a pair of UL labeled "A" (3-hour rated) fire doors.

The section of the west wall common with the turbine building is 12-inch thick structural reinforced concrete doweled and keyed into the ceiling slab. There is a pair of ~~UL labeled "A" (3-hour rated)~~ fire doors, CERTIFIED WITH A CERTIFIED FRAME located in this wall.

Continuing clockwise around the zone, the walls become 11 5/8-inch thick hollow concrete block with a silicone foam fire seal occurring as described previously. There is also another pair of UL labeled "A" (3-hour rated) fire doors in this wall.

The next section of the west wall, common with the turbine driven reactor feed pump area (fire zone 5A2), is 48-inch thick structural reinforced concrete with no access openings. The columns have a minimum 3-hour rating.

All perimeter walls have a 3-hour fire rating.

The floor slab of this zone, which is also the ceiling slab of the electrical equipment room (fire zone 4D4), is at elevation 768 feet-0 inch. It consists of 6-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking. The only exception is between column lines 18 and 19 where there is 36-inch thick concrete with no decking. The entire floor slab is supported by protected steel beams and columns. In the south area of this zone the beams and columns required for structural support of the control room floor (fire zone 4C1) are fire protected and have an assembly rating of 3 hours. The floor slab has a 2-hour rating. There are four floor drains in this area. The floor is covered with vinyl asbestos tile, and there is a 4-inch vinyl cove base around the walls.

The ceiling slab of this room, which is also the floor slab of fire zone 4B, is at elevation 786 feet-6 inches. It consists of 24-inch thick structural reinforced concrete supported by protected steel beams and columns. In the south area of this zone the beams and columns required for structural support of the control room ceiling have an assembly rating of 3 hours. The ceiling slab in this area has a 3-hour rating. The south area

Combustible Materials

See Subsection H.3.4.10.

Fire Loading

The average fire loading for this zone, including a transient loading of 55 gallons of lubricating oil, is 93,000 Btu/ft^2. This is equivalent to a fire severity of approximately 1 hour.

Extinguishing and Detecting Capabilities

See Subsection H.3.4.10.

Design-Basis Fire

Same as Subsection H.3.4.11 but for Unit 2.

Planned Modifications

No modifications are required in this zone.

H.3.4.12 Unit 1 Auxiliary Equipment Room - Fire Zone 4E1

Description

All four walls in this zone are 11 5/8-inch hollow concrete block extending up to within 1 inch of the steel beams. The 1-inch space is filled with a silicone foam fire seal. All structural steel contained in the walls is fire protected. In the north wall there is a pair of doors allowing access to the auxiliary equipment room (fire zone 4E2). In the south wall the doors allow access to the Division 2 switchgear room (fire zone 4E3), and in the west wall a pair of doors allow access to the turbine building (fire zone 5E13). There are no access openings in the east wall. All doors are UL labeled "A" (3-hour rated) fire doors. All four walls have a 3-hour fire rating and all duct penetrations through these walls are provided with fire dampers.

The floor slab of this zone, which is also the ceiling slab of the labs and offices of fire zone 4F3, is at elevation 731 feet 0 inch. It is 9-inch thick concrete on 1 1/2-inch by 18 gauge metal decking supported by protected steel beams. There is one floor drain provided. The floor slab has a 3-hour fire rating from an internal source and a 2-hour rating from an external source.

The ceiling slab of this zone, which is also the floor slab of the Unit 1 cable spreading room, is at elevation 749 feet-0 inch. It is a 12-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking supported by protected steel beams. There is a 2-hour internal fire rating on the slab and a 3-hour external fire rating. The ventilation openings in this

H.3.4.14 Unit 1 Division 2 Essential Switchgear Room - Fire Zone 4E3

Description

The north and west walls, which are common to fire zones 4E1, 4E4, and 5B11 are all 11 5/8-inch hollow concrete block. The block extends up to within 1 inch of the steel beams. The 1-inch space is filled with a silicone foam fire seal. The structural steel contained in the wall is fire protected. The free standing columns in the room have 1-hour fire protection. There are three access openings in these walls, ~~all~~ two of which have UL labeled "A" (3-hour rated) fire doors (one pair is a certified fire door).

The east wall which is common to the reactor building fire zone 2F is 36-inch structural reinforced concrete doweled and keyed into the ceiling slab. There are no access openings.

Along the east wall is the main steamline shaft fire zone 2K. The common walls between these two zones are 56-inch thick structural reinforced concrete, doweled and keyed into the ceiling slab. There are no access openings.

The south wall of this zone is a minimum 24-inch thick structural reinforced concrete, doweled and keyed into the ceiling slab. The steel columns within the wall have a 3-hour fire rating. There is a nonrated door, with a 10-inch by 10-inch by 1/4-inch polished plate glass vision panel, providing access to an airlock which has a UL labeled "A" door (with a frame judged consistent with the wall rating) leading to the diesel-generator room roof.

Except for the ventilation openings, all walls have a 3-hour fire rating.

The floor slab of this zone, which is also the ceiling slab of fire zone 4F1, is at elevation 731 feet-0 inch. It is a 9-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking supported by protected steel beams. There is one floor drain provided. The floor slab has a 2-hour fire rating from an external source and a 3-hour rating from an internal source.

The ceiling slab of this zone, which is also the floor slab of the electrical equipment room (fire zone 4D3), is at elevation 749 feet-0 inch. It is a 12-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking supported by protected steel beams. The ceiling slab has a 3-hour fire rating from an external source and a 1-hour rating from an internal source.

In the southeast corner of this zone is a stairwell. The stairs are enclosed on the east and south sides by 24 inches to 36 inches of structural reinforced concrete. The north and west

walls of the stair enclosure are 7 5/8-inch hollow concrete block with a fire seal in the 1-inch space between the block wall and metal decking. Located in the block wall is a UL labeled "B" (1 1/2-hour rated) fire door with a certified frame. This enclosure has a 2-hour fire rating.

Also in this zone is a battery room. The north and west walls of the battery room are the north and west walls of this zone (11 5/8-inch hollow concrete block, 3-hour fire rated). The east and south walls are 7 5/8-inch hollow concrete block. In the east wall there is a UL labeled "A" (3-hour rated) fire door. The ceiling of the battery room is at elevation 738 feet-8 inches. It consists of 6-inch thick concrete on 1 1/2-inch by 16 gauge metal decking supported by the block walls. This room has a 3-hour fire rating.

The ventilation openings in this zone are provided with fire dampers. The ventilation system uses an outdoor air and return air mixture to limit the room temperature to 65° F minimum and 104° F maximum. Area ionization detection system is provided which annunciates smoke detection on the local panel and the fire protection panel in the main control room. The ventilation system can be started manually by a locally mounted control switch.

Safety-Related Equipment

This zone contains the ESF Division-2 switchgear, motor-control centers, batteries, and dc power supply.

Protection Criteria and Measures

Automatic fire detection and manual fire fighting are provided. Fire barriers are used to prevent the spread of fire.

Combustible Materials

The primary combustible materials in this zone consist of cable insulation.

Fire Loading

The average fire loading for this zone, including a transient fire load equivalent to 55 gallons of lube oil, is 71,800 Btu/ft^2. This is equivalent to a fire severity of less than 1 hour.

Extinguishing and Detecting Capabilities

Ionization type fire detectors that sound an alarm in the control room are provided. Manual fire fighting equipment consists of two firehose stations with 50 feet each of 1 1/2-inch UL listed hose, two Class 2A-20B:C portable fire extinguishers, two Class

Design-Basis Fire

See Subsection H.3.4.14.

Planned Modifications

No modifications are required in this zone.

H.3.4.16 Unit 1 Division 1 Essential Switchgear Room - Fire Zone 4F1

Description

The north wall of this zone is common with fire zone 4F3. This wall is 11 5/8-inch hollow concrete block which extends up to within 1 inch of the ceiling slab. The 1-inch space if filled with a silicone foam fire seal. Located in the wall is one UL labeled "A" (3-hour rated) fire door with a certified frame. This wall has a 3-hour fire rating.

In the northeast area of the Division 1 essential switchgear room, is the main steamline shaft (fire zone 2K). The common walls between the two zones are 56-inch thick structural reinforced concrete with no access openings. They have a 3-hour rating.

The east wall, which is common to the Unit 1 reactor building, is 36-inch structural reinforced concrete with no access openings. The wall has a 3-hour fire rating.

The south wall separates this zone from the turbine building ground floor corridor. One section of the wall is a minimum 24-inch thick structural reinforced concrete and the other section is 11 5/8-inch hollow concrete block with a fire seal located in the 1-inch space between the block wall and the metal decking. Located in the wall are two UL labeled "A" (3-hour rated) fire doors. This wall has a 3-hour fire rating.

The west wall, which is common with fire zone 5C11, is 11 5/8-inch hollow concrete block with a fire seal located in the 1-inch space between the block wall and the metal decking. Located within the wall is one ~~UL labeled "A" (3-hour rated)~~ certified fire door. This wall has a 3-hour rating.

The southeast corner of this zone is a stairwell. The north wall of the stairwell is 48 inches of structural reinforced concrete. The door entering the stairwell is a UL labeled "B" (1 1/2-hour rated) fire door. The west wall, which is common with the 250-V battery room, is 11 5/8-inch hollow concrete block. There is one column embedded within the wall with flanges protected on both sides of the wall. The stairwell has a 2-hour fire rating.

Fire Loading

The fire loading for this zone, including a transient fire load equivalent to 55 gallons of lubricating oil, is 82,300 Btu/ft². This is equivalent to a fire severity of 1 hour.

Extinguishing and Detecting Capabilities

See Subsection H.3.4.16.

Design-Basis Fire

See Subsection H.3.4.16.

Planned Modifications

No modifications are required in this zone.

H.3.4.18 Auxiliary Building Ground Floor - Fire Zone 4F3

Description

The north wall of this zone consists of both concrete block and structural reinforced concrete. The east section of the wall common with the main steamline shaft (fire zone 3K) is 56-inch thick structural reinforced concrete with no access openings. This section of the north wall has a 3-hour rating. The west section of the north wall is 11 5/8-inch hollow concrete block, which extends up to within 1 inch of the metal decking. The 1-inch space is filled with a silicone foam fire seal. Located within this section of the wall is one UL labeled "A" (3-hour rated) fire door with certified frames. There are two columns embedded within the wall. This wall has a 3-hour fire rating.

The east wall of this zone is common wit' both the Unit 1 reactor building (fire zone 2G) and the Unit 2 reactor building (fire zone 3G). This wall is 36-inch thick structural reinforced concrete with two ~~UL labeled "A" (3-hour rated) fire~~ doors. This wall has a 3-hour fire rating, with the shield doors judged consistent with the wall rating.

The south wall of this zone is common with the main steamline shaft (fire zone 2K) and the Unit 1 switchgear room (fire zone 4F1). For details on this wall see the north wall description with the only difference being the column conditions. A column is adjacent to the wall and is connected to the ceiling slab of the 125-V battery room by welding studs which pass through the wall. The south wall has a 3-hour fire rating.

The west perimeter walls are 11 5/8-inch hollow concrete block with a fire seal located in the 1-inch space between the block walls and the metal decking. Due to the location of the fire wall this zone also includes the decontamination room, the first aid room, stairwell, and elevator. There are two UL labeled "A"

H.3.5 Fire Area 5: Turbine Building - Units 1 and 2

The turbine building is common to Units 1 and 2. It has been divided into 36 zones for the purpose of the fire hazards analysis. These zones are listed in Table H.2-1 and shown on Figure H.2-1. Each zone is discussed in the following subsections. Table H.3-1 lists the safety-related and radioactive equipment within each zone, and Table H.3-2 summarizes the combustible hazards and fire fighting capabilities present.

H.3.5.1 Unit 1 Turbine Driven Reactor Feed Pump Area - Fire Zone 5A1

This zone consists of both Unit 1 turbine driven reactor feed pump rooms at elevation 768 feet-0 inch and the common exhaust duct room beneath them at elevation 749 feet-0 inch.

All walls and slabs at both elevations are a minimum of 36-inch thick structural reinforced concrete. The walls and slabs are all doweled together except for the north wall at elevation 749 feet-0 inch. This wall, which is common with the cable areas fire zone 5A4, extends up to within 2 inches of the protected steel beams supporting the ceiling slab at elevation 768 feet-0 inch. The 2-inch space is filled with a silicone foam fire seal.

The columns and vertical bracing at the north, south, and east walls are embedded within the walls.

The columns embedded in the west wall at elevation 749 feet-0 inch have their flanges exposed on the reactor feed pump side of the wall, and at elevation 768 feet-0 inch their flanges are exposed on the fire zone 5A3 side of the wall.

At elevation 749 feet-0 inch the west wall has a 50 foot-0 inch by 16 foot-0 inch concrete opening for exhaust ducts. The sill of four concrete openings which are a minimum 14 foot-0 inch by 12 foot-0 inch is at elevation 777 feet-6 inches. These four openings will be partitioned with blowout panels. At elevation 768 feet-0 inch there are two UL labeled "A" fire doors.

Due to the openings and exposed steel beams, the west and north walls have ~~wall has~~ no fire rating. The ~~north,~~ south, and east walls have a 3-hour fire rating.

All beams supporting slabs at elevation 749 feet-0 inch, 768 feet-0 inch, and the ceiling slab at 794 feet-0 inch are partially exposed. At elevation 749 feet-0 inch there are four floor drains. At elevation 768 feet-0 inch there are six floor drains. The ceiling slab of this zone, which is also a portion of the floor slab of fire zone 4B, is at elevation 794 feet-0 inch. The slab, which is 36 inches thick, has two areas, 28 feet-0 inch by 14 feet-0 inch by 36 inches thick, of removable

H.3.5.3 Turbine Operating Floor and Heater Bay - Fire Zone 5A3

In the north and south areas of this zone the exterior walls are insulated fluted metal siding. These outside walls are supported by unprotected steel beams, girts, columns, and vertical bracing. All siding above elevation 767 feet-0 inches is designed as blow-in/blow-out siding. The siding in these areas extends up beyond the roof deck at elevation 843 feet-6 inches to form a 16-inch high parapet. The exterior walls in both areas have no fire rating.

The remaining portion of the east wall is common with the turbine driven reactor feed pump areas (fire zones 5A1 and 5A2) and the auxiliary building (fire zones 4C2, 4C3, and 4C4). For a complete description of these walls refer to the previously mentioned fire zones. The sections of the wall common to fire zones 5A1 and 5A2 have no ratings due to openings and exposed steel. The section of the wall common to fire zones 4C2, 4C3, and 4C4 has a 3-hour fire rating.

In the west area of this zone, known as the heater bay area, the walls are a minimum 16-inch thick structural reinforced concrete. These outside walls extend up beyond the roof deck at elevation 777 feet-0 inch to form a 1 foot-4 inch high parapet. From elevation 777 feet-0 inch at column line "W" the wall continues up with siding beyond the roof deck to form a 1 foot-4 inch high parapet. The only exception is between columns 5-12 and 18-25 up to elevation 801 feet-6 inches where there are concrete walls extending beyond the roof deck at elevation 801 feet-6 inches to form a parapet. Since all columns, beams, and vertical bracing at these concrete walls are exposed, the walls have a 3-hour fire rating from external sources but no fire rating from internal sources.

The section of the wall in the heater bay area common with the solid radwaste building is 48-inch thick structural reinforced concrete with no access openings. This wall extends up to elevation 761 feet-6 inches. In this section of the wall, the columns and vertical bracing are embedded within the wall. This section of the wall has a 3-hour fire rating.

The walls common with the service building have a 3-hour fire rating with UL labeled "A" doors with a frame judged consistent with the wall rating. For further details see Subsection H.3.9.1 (fire zone 9A).

The roof over the turbine area is at elevation 843 feet-6 inches and the roof over the heater bay area is at elevation 777 feet-0 inch. There is a small section at elevation 801 feet-6 inches. The roofing is UL Class "A". It is for the most part on 1 1/2-inch by 18 gauge metal decking; however, in some areas it is on 6-inch monolithic reinforced concrete on metal decking. These areas are supported by exposed steel beams. Also there is an area where the roofing is on 48-inch thick monolithic

with certified frames.

"A" fire doors. All columns embedded in these walls have a 3-hour fire rating. There is one column in the north wall connected to vertical bracing, which extends out and is connected to an exposed freestanding column in fire zone 5C11. The north, south, and east boundary walls have a 3-hour fire rating.

The stairwell at this level is enclosed by 48-inch thick structural reinforced concrete block walls and a UL labeled "A" fire door. At this level the stairwell has a 3-hour fire rating. This stairwell leads down to fire zone 5D3 where it is open. The stairwell does not extend up.

Mezzanine Floor - Elevation 731 feet-0 inch

All barrier walls at this level are either a minimum 35 5/8-inch thick structural reinforced concrete block or 45-inch thick structural reinforced concrete which is keyed and doweled into the slab above.

The concrete block in the north boundary walls extends up to within 1 inch of the ceiling slab. The space between the ceiling slab and the top of the wall, and also where beams penetrate the wall, is filled with a thermafiber fire seal. All columns embedded in these walls have a 3-hour rating. Two columns are connected to vertical bracing which extends out and is connected to exposed freestanding columns in fire zones 5B3, and 5B4. All doors in these walls are UL labeled "A" fire doors. There is one section of the north boundary walls which is concrete. This wall runs north-south and has column flanges exposed on the fire zone 5B1 side of the wall. The north boundary walls have a 3-hour fire rating with the only exception being the concrete wall which has a 3-hour fire rating on fire zone 5B4 side only.

The portion of the east wall common with fire zone 5B13 is concrete. The columns embedded in this wall have a 3-hour fire rating. This portion of the east wall has a 3-hour fire rating. The portion of the east wall common with fire zone 5B9 has column flanges exposed on both sides of the wall. A 9 foot-0 inch by 22 foot-0 inch concrete opening in this portion of the wall is covered by a blowoff siding panel. This portion of the wall has no fire rating.

The south and west boundary walls consist of concrete block which extend up to within 1 inch of the ceiling slab. The spaces between the ceiling slab and the top of the walls, and also where beams penetrate the walls, are filled with a thermafiber ventilation seal. All doors in these walls have no fire rating. The south and west boundary walls have no fire rating. The floor slabs of this zone have varying elevations and thicknesses, from a 76-inch thick foundation mat at elevation 662 feet-4 inches, 36 inches to 60 inches thick, structural reinforced concrete for the upper basement floor slabs, and 8 inches of finished concrete on a 40-inch thick structural reinforced concrete slab at elevation

H.3.5.17 Balance-of-Plant Cable Area - Fire Zone 5B13

Description

The north and south walls, which separate the reactor feed pump area (fire zones 5B9 and 5B10) from fire zone 5B13 consist of 20-inch thick structural reinforced concrete that extends up to and is doweled into the ceiling slab above. A removable concrete block shield wall 11 feet-0 inch wide by 13 feet-11 3/4 inches high is located within this wall. At the top of the removable wall there is a silicone foam fire seal. There is a column in this wall which has a 2-hour rating. These walls have a 2-hour fire rating.

The east wall, which is common with fire zones 4E1, 4E2, 4E3, and 4E4 is 11 5/8-inch thick concrete block, extending up to within 1 inch of the protected steel beams. The space is filled with a silicone foam fire seal. Leading to each of the four adjacent zones is a pair of ~~[illegible]~~ fire doors. The wall has a 3-hour fire rating. ~~certified~~ certified ASSEMBLIES.

The north and south sections of the west wall are a minimum 60-inch thick structural reinforced concrete which extends beyond the ceiling slab of this zone. There are columns embedded in the walls. These sections of the west wall have a 3-hour fire rating. The middle section of the west wall, common with fire zone 5B3, is 11 5/8-inch thick concrete block which extends up to within 1 inch of the metal decking at the ceiling. In the space between the top of the walls and the metal decking of the ceiling, and also where protected beams penetrate this wall there is a silicone foam fire seal. The beams which penetrate this wall are connected to protected columns in fire zone 5B3. The wall is not supported by the steel members. This section of the west wall has a 3-hour fire rating.

The floor slab, at elevation 731 feet-0 inch, which is also a portion of the ceiling slab of fire zone 5C11, consists of 9-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking supported by exposed beams and columns. There are 11 feet-0 inch by 12 feet-0 inch by 8-inch thick areas of removable concrete slabs. There is a 3-inch bearing surface in the direction of the span. The slab has a 3-hour fire rating from an internal source but no rating from an external source due to the exposed steel.

The ceiling slab of this zone, which is also the floor slab of fire zones 5A1, 5A2, and 5A4, is at elevation 749 feet-0 inch. It consists of a minimum of a 10 feet-0 inch by 12 feet-0 inch by 12-inch thick concrete slab on 1 1/2-inch by 18 gauge metal decking supported by exposed steel beams and columns. There are two areas of 8-inch thick removable concrete slabs. There is a 3-inch bearing surface in the direction of the span. The ceiling

PLanned Modifications

No modifications are required in this zone.

H.3.5.18 Unit 1 Valve Aisle - Fire Zone 5C1

The north wall of this zone is 23 5/8-inch thick concrete block which extends up to within 1 inch of the metal decking at the ceiling. In the space between the top of the wall and the metal decking, and also where beams penetrate the wall, there is a thermafiber fire seal. For access to fire zone 5C11 there is a UL labeled "A" fire door with a certified frame. With the exception of the steel beam, the wall has a 3-hour rating.

The east wall which is common with fire zone 5B1 is 35 5/8-inch thick concrete block which extends up to within 1 inch of the metal decking at the ceiling. In the space between the top of the wall and the metal decking, and also where beams penetrate the wall, there is a thermafiber ventilation seal. The wall has no fire rating.

The south and west walls are exterior walls consisting of either 16-inch thick structural reinforced concrete which extends beyond the ceiling slab which is doweled and keyed into it or 15 5/8-inch sections of concrete block. Along the west wall there are exposed columns. The south wall has a 3-hour fire rating. The west wall has a 3-hour fire rating from an exterior source only. The floor slab of this zone is at elevation 710 feet-6 inches and is 48-inch thick structural reinforced concrete slab supported on concrete beams. There are no access openings provided in the floor slab of this zone. There are five floor drains. The slab is not fire rated.

The ceiling slab of this zone is at elevation 728 feet-0 inch and elevation 731 feet-0 inch. It is a 6-inch thick structural reinforced concrete slab on 1 1/2-inch by 18 gauge metal decking supported on exposed structural steel beams. There is a 2-foot 6-inch by 3-foot 0-inch floor hatch in the ceiling slab at elevation 731 feet-0 inch with a ladder extending up from elevation 710 feet-6 inches. The ceiling slab has no fire rating.

Safety-Related Equipment

This zone does not contain any safety-related equipment.

Protection Criteria and Measures

Due to the lack of safety-related equipment and the normal lack of combustibles, the steel is not fire protected. Manual fire protection equipment is provided.

with certified frames

wall that extends up to within 1 inch of the ceiling slab of this zone, where there is a thermafiber fire seal. Where the wall is penetrated by steel beams, a thermafiber fire seal is used as the closure. There are two UL labeled "A" fire doors provided in these barrier walls. In the north wall of fire zone 5B1 and the south wall of fire zone 5B2 there is a column with vertical bracing connecting it to the freestanding bracing exposed steel columns located in fire zone 5C11. These walls have a 3-hour fire rating.

There are no barrier walls separating this zone from fire zones 5C3 and 5C4. See Subsections H.3.5.20 and H.3.5.21 for a description of the boundaries.

The diesel-generator building fire zones 7B1 and 8B1 are separated from this zone by 12-inch thick, structural reinforced concrete walls that extend up and are keyed and doweled into the ceiling slab of this zone. There are two UL labeled "A" fire doors provided in these barrier walls. These walls have a 3-hour fire rating.

The auxiliary building fire zones 4F1, 4F2, and 4F3 are separated from this zone by 11 5/8-inch thick hollow concrete block which extends up to within 1 inch of the metal decking at the ceiling. The space between the top of the wall and the metal decking, and also where beams penetrate the wall, is filled with a silicone foam fire seal. There are ~~five~~ two UL labeled "A" fire doors + three certified fire doors provided in these walls. All columns in this wall have a 3-hour fire rating. This wall has a 3-hour fire rating.
The fire door from 4F1 to the corridor has a certified frame,

Fire zones 5C1 and 5C2 are separated from this zone by 23 5/8-inch thick hollow concrete block walls, which extend up to within 1 inch of the metal decking at the ceiling. The space at the top of the wall, and also where beams penetrate the wall, is filled with a thermafiber fire seal. UL labeled "A" fire doors are provided for access to each fire zone. With the exception of the beams, the walls have a 3-hour fire rating.

The radwaste building fire zones 6B1, 6B2, 6B3, and 6C are separated from this zone by a 48-inch thick structural reinforced concrete wall that is keyed and doweled into the ceiling slab. Two UL labeled "A" fire doors are provided in this barrier wall. The wall has a 3-hour fire rating. with certified frames

The walls common with fire zones 5C5, 5C6, 5C7, 5C8, 5C9, and 5C10 are separated from this zone by barrier walls that are 48-inch thick structural reinforced concrete into which the ceiling slabs are keyed and doweled. In addition, the north sides of fire zones 5C6 and 5C8 and the south sides of zones 5C5 and 5C7 are separated from this zone by 47-5/8-inch thick, hollow concrete block walls that extend up to within 1 inch of the ceiling slab. The space is filled with a thermafiber ventilation

seal. There are three nonfire rated doors provided in these barrier walls. The walls have no fire rating.

The service building fire zones 9C1 and 9C3 are separated from this zone by 11 5/8-inch thick concrete block. The block extends up to within 1 inch of the metal decking and the ceiling. In the space between the top of the wall and the metal decking, and also where beams penetrate the wall, there is a thermafiber fire seal. All doors in this wall are UL labeled "A" fire doors. The columns and vertical bracing are protected. The trolley beams which penetrate this wall are protected on the turbine building side of the wall only. The wall has a 3-hour fire rating.

In the north and south areas of this zone the east walls are exterior walls. They consist of 11 5/8-inch concrete block. On the interior side of the walls there are exposed columns, beams, and vertical bracing. The walls have a 3-hour fire rating from an exterior source only.

All other exterior walls are insulated fluted metal siding. The walls are supported by unprotected steel beams, columns, and vertical bracing. The walls have no fire rating.

A corridor near the south end of this zone separates the Unit 1 diesel generator building from the auxiliary and reactor buildings at this elevation. The north wall of this corridor separates fire zone 5C11 from fire zones 2G and 4F1. It consists of either minimum 24-inch thick structural reinforced concrete keyed and doweled into the ceiling slab or 11 5/8-inch thick hollow concrete block extending up to within 1 inch of the roof slab. The space is filled with a silicone foam fire seal. All columns and beams within the wall have a 3-hour fire rating. All doors located in this wall are UL labeled "A" fire doors with certified frames except for a 2½" thick solid steel shield door from 2G. This wall has a 3-hour fire rating, with the shield door judged consistent with the wall rating.
In the south area of this corridor there is a vestibule allowing access outside the building. The walls of the vestibule are minimum 12-inch thick structural reinforced concrete. The inner door to the vestibule is UL labeled "A" with a certified frame. This wall has a 3-hour fire rating.

The south wall, which is common to diesel-generator building fire zones 7B1, 7B2, and 7B3, is 12-inch thick structural reinforced concrete keyed and doweled into the roof slab. Located within the wall are six doors, three of which are motor-operated rolling steel doors. All doors are UL labeled "A" fire doors with certified frames on the swing doors. The south wall has a 3-hour fire rating.

The roof slab, at elevation 736 feet-6 inches, is a UL Class "A" builtup roofing system on a 12-inch thick structural reinforced concrete slab. It is supported by protected beams and columns which have a 3-hour fire rating.

H.3.5.29 Unit 1 HPCS Switchgear Area - Fire Zone 5D1

Description

The north and west walls of this zone are common with the reactor building fire zone 2K. The walls consist of either a minimum 18-inch thick structural reinforced concrete or 19 5/8-inch thick concrete block. At the top of the block wall concrete walls there is a 1-inch gap filled with a thermafiber fire seal. There is one UL labeled "A" fire door in the west wall. ~~Zone 5D2 door is provided~~ with a frame judged consistent with the wall rating. The east wall common to the reactor building fire zone 2H2 and the south wall common to the diesel generator building fire zones 7C4, and 7C5 are 36-inch thick structural reinforced concrete keyed and doweled into the roof slab. In the south wall there is a watertight bulkhead door (required for flood protection).

With the exception of the watertight door in the south wall, all walls have a 3-hour fire rating.

In the southeast corner of this zone there is a stairwell. It is enclosed on the north and west by 7 5/8-inch concrete block with a thermafiber fire seal at the top. The access door is a UL labeled "A" fire door. The stairwell has a 3-hour rating.

To the west of the stairwell there is a battery room. It is enclosed by 7 5/8-inch concrete block which supports the ceiling slab. The ceiling slab at elevation 695 feet-6 inches is 6-inch concrete on 1 1/2-inch by 16 gauge metal decking. The access door is a UL labeled "A" fire door. The battery room has a 3-hour rating.

The floor and ceiling slabs of this zone are a minimum 28-inch thick structural reinforced concrete. There are two floor drains provided. Both slabs have a 3-hour fire rating.

The temperature in this zone is maintained between 65° F and 122° by the HPCS cooling water pump room ventilation system and the battery room exhaust system.

Safety-Related Equipment

This zone contains the switchgear, motor-control center, 125-V battery and d-c power supply for Unit 1 ESF Division-3 (HPCS), and some ESF Division-3 cables.

Protection Criteria and Measures

Automatic fire detection and manual fire protection equipment are provided.

31,400 Btu/ft²: This loading is equivalent to a fire loading of less than 1/2 hour.

Extinguishing and Detecting Capabilities

See Subsection H.3.5.29.

Design-Basis Fire

See Subsection H.3.5.29.

Planned Modifications

No modifications are required in this zone.

H.3.5.31 Demineralizer Zone - Fire Zone 5D3

Description

This zone is enclosed by minimum 42-inch thick structural reinforced concrete walls. The south and west walls are building foundation walls. The east wall is an interior wall common with fire zones 5C3 and 5B1. The north wall is common to fire zone 6D and has a UL labeled "A" fire door with a frame judged consistent with the wall rating. All four walls have a 3-hour fire rating.

The floor and ceiling are a minimum of 18-inch thick structural reinforced concrete slabs. An open stairway is provided for access up to fire zone 5B1 and down to fire zone 5E1. In fire zone 5B1 (elevation 710 feet-6 inches) the stairwell is enclosed by 3-hour fire rated walls and door. A 2-foot 6-inch by 3-foot 0-inch floor hatch for ladder access is provided to fire zone 5E1, as described in Subsection H.3.5.35. The ceiling slab has numerous areas of grating and removable concrete slabs with steel frames. The floor and ceiling slabs have no fire ratings.

Supply air is ducted into the water treatment area and service aisle and exhausted through the heater drain tank cubicle into the turbine cavity. There are two 100% capacity booster fans at the inlet into the cavity which are interlocked to the main turbine building supply fans. The temperature is maintained between 85° F and 104° F, except for the heater drain tank cubicle which can rise to 122° F.

Safety Related Equipment

This zone does not contain any safety-related equipment.

Protection Criteria and Measures

Due to the low combustible loading and lack of safety-related equipment, only manual fire protection equipment is provided.

with a fire wall rating

H.3.5.33 Turbine Building Upper Basement Area - Fire Zone 5D5

Description

The west wall, common with fire zone 6D, is 11 5/8-inch concrete block with a thermafiber fire seal located in the 1-inch space at the top of the wall. There is a an airlock with a UL labeled "A" fire door, allowing access between the radwaste and turbine building. This wall has a 3-hour fire rating.

The majority of the walls in this zone are a minimum 42-inch structural reinforced concrete. There are sections of masonry shield walls which are a minimum 55 5/8-inches thick with a thermafiber fire seal at the top. These walls have a 3-hour fire rating.

The walls common with the clean and dirty tank room fire zone 5D6, are 11 5/8-inch concrete block with a thermafiber fire seal located at the top of the wall. The doors located in these walls are UL labeled "A" fire doors. The walls have a 3-hour fire rating. For additional description, see fire zone 5D6.

In the northwest corner of this zone there is the waste surge tank room which is part of fire zone 6E. It is separated from fire zone 5D5 by minimum 42-inch thick structural reinforced concrete walls. All walls have a 3-hour fire rating.

The floor and ceiling slabs are a minimum 24-inch thick structural reinforced concrete. There are 18 floor drains.

The stairwell is enclosed by minimum 7 5/8-inch concrete block walls with a thermafiber fire seal at the top. The door for access to the stairs is a UL labeled "A" fire door. The stairwell has a 3-hour fire rating.

Also located in this zone is an elevator pit. It is enclosed by 11 5/8-inch concrete block with a fire seal at the top. Access is by a UL labeled "A" fire door. In the pit there is one floor drain. The elevator pit enclosure has a 3-hour fire rating.

There are fire dampers in the ventilation openings. The zone communicates with elevation 710 feet-6 inches above through a ventilation opening.

Supply air is ducted into the area from both Units 1 and 2 and exhausted to the floor above through an opening in the 710-foot 6-inch slab. The temperature is maintained between 65° F and 104° F within the zone.

provided to extinguish any fires. A fire in this zone would not affect any safety-related equipment.

Planned Modifications

No modifications are required in this zone.

H.3.5.35 Unit 1 Turbine Building Lower Basement - Fire Zone 5E1

Description

All four foundation walls of this zone are a minimum 42-inch thick structural reinforced concrete which are keyed and doweled into the ceiling slab.

The north wall, which is common to fire zone 6E, has a pair of UL labeled "A" (3-hour rated) fire doors with a certified frame. There are no access openings in the east, west, and south walls. All four walls have a minimum 3-hour fire rating.

In this zone are interior concrete and concrete block walls (no fire rating) that divide this zone into 30 feet-0 inch by 25 feet-0 inch rooms. The interior walls extend up to 1 inch beneath the ceiling slab where the gap is filled with a thermafilter ventilation seal.

The floor slab of this zone is at elevation 663 feet-0 inch and is an 84-inch thick structural reinforced concrete foundation slab. There are 19 floor drains provided in this zone. Two 4-foot 0-inch by 4-foot 0-inch (approximate) sump pits are located next to the south wall.

The ceiling slab of this zone is at elevation 687 feet-0 inch is also the floor slab of fire zone 5D3. It consists of a 24-inch thick structural reinforced concrete slab supported by concrete beams, walls, and columns. An open stairway is provided next to the north wall for access to fire zone 5D3. There is a 10-foot 0-inch by 7-foot 0-inch opening for the stairs in the ceiling slab. A 2-foot 6-inch by 3-foot 0-inch floor hatch for ladder access is also in the ceiling slab. It consists of 1/4-inch checkered plate, fiberglass insulation, and a 22 gauge steel liner. The ceiling slab has no fire rating.

This zone contains the heater drain pump cubicles, condensate booster pump cubicles, and the associated service aisle for Unit 1. Each cubicle is enclosed; however, they communicate with the area located above through ventilation openings. Fire dampers are not provided in the inlet and outlet ducts.

The turbine building fire sump and oil separator are located in the floor of this zone.

Safety-Related Equipment

This zone does not contain any safety-related equipment.

Protection Criteria and Measures

Automatic fire detection and manual fire protection equipment are provided.

Combustible Materials

The primary combustible material in this zone is cable insulation. There is also some contribution from ventilation gaskets and seals.

Fire Loading

The average fire loading for this zone is 45,000 Btu/ft² which is equivalent to a fire severity of approximately 1/2 hour. A transient fire load is not considered for this zone.

Extinguishing and Detecting Capabilities

Ionization detectors are provided to sound an alarm in the control room. Manual fire protection consists of one firehose station with 75 feet of 1 1/2-inch UL listed hose, one Class 2A-2B:C portable fire extinguisher, and one Class 20B:C portable fire extinguisher.

Design-Basis Fire

The design-basis fire would not affect safety-related equipment.

Planned Modifications

No modifications are required in this zone.

H.3.6.3 Elevation 706 feet- 6 inches - Fire Zone 6B2

Description

Almost all walls of this zone are structural reinforced concrete, which are keyed and doweled into the slab above. They vary in thickness from 18 inches to 95 inches.

The east portion of the south wall, which is common to fire zone 6B1, is 11 5/8-inch thick concrete block. It extends up to within 1 inch of the ceiling slab. The space is filled with a thermafiber fire seal. ~~There is a pair of UL labeled H.M. doors provided.~~ The south portion of the east wall is also common with fire zone 6B1. It is a 36-inch thick concrete wall. The two walls common with fire zone 6B1 have a 3-hour rating.

WITH THE EXCEPTION OF THE ACTIVE LEAF IN THE PAIR OF DOORS LOCATED IN ONE OF THE ...

H.3.6.2 Radwaste Control Room - Fire Zone 6B1

Description

The north wall, which is common to fire zone 6B2, is 11 5/8-inch thick concrete block. It extends up to within 1 inch of the ceiling slab. The space is filled with a thermafiber fire seal. There is a pair of ~~UL labeled "A" doors~~ certified fire doors with a frame judged consistent with the wall rating provided. The wall has a 3-hour fire rating.

All other barrier walls of this zone are structural reinforced concrete which are keyed and doweled into the slab above.

The east boundary walls are 48-inch thick concrete. All steel members in the wall common with the turbine building fire zone 5C11 have a minimum 3-hour fire protection. For access to the turbine building there is a UL labeled "A" fire door. The walls common with the radwaste pipe tunnel, fire zone 6C, are 48 inch thick concrete with a certified frame.

There are no openings in the wall common with fire zone 6B3. With the exception of the walls common with the pipe tunnel, the east boundary walls have a 3-hour fire rating.

The south boundary walls are 12-inch thick concrete exterior walls.

A nonfire rated door is provided. With the exception of the wall containing the door, all the other exterior walls have a 3-hour fire rating.

The west wall is 36-inch thick concrete and has a 3-hour fire rating.

The stairwell in this zone is enclosed by either 11 5/8-inch thick concrete with a fire seal at the top or a minimum 18-inch thick concrete. Access is by a nonfire rated door. The stairwell has no fire rating.

The floor slab at elevation 710 feet-6 inches is 24-inch thick structural reinforced concrete. This slab is not fire rated.

The ceiling slab thickness varies. At elevation 734 feet-6 inches it is 36-inch thick structural reinforced concrete. At elevation 720 feet-5 inches it is a 12-inch structural concrete roof slab with a builtup UL Class "A" roof covering. The slab has no fire rating due to the nonfire rated stairwell.

All ventilation openings contain fire dampers. Supply air is ducted into the area from a self-contained package air conditioning unit located outside the control room. This system recirculates room air, mixed with minimum outside air, and maintains a temperature of 75° F on a year-round basis.

The north, west, and west portion of the south wall are exterior concrete walls. In the east portion of the north wall and in the middle portion of the west wall there are nonfire rated doors. With the exception of the portions of the walls which have nonfire rated doors, the exterior walls have a minimum 3-hour fire rating.

The portion of the east wall common to the turbine building fire zone 5C11 is 36-inch thick concrete. For access to fire zone 5C11 there is a UL labeled "A" fire door. This portion of the wall has a 3-hour fire rating. WITH A CERTIFIED FRAME.

The portion of the east wall which is common to fire zone 6B3, is 48 inch thick concrete. In this wall there is a 23-foot 6-inch wide opening. There is no fire rating for this wall.

Both the floor and ceiling slabs are structural reinforced concrete. The floor slab at elevation 706 feet-6 inches is a minimum 24 inches thick. There are 17 floor drains. The ceiling slab at elevation 734 feet-6 inches is 36 inches thick. There are numerous 36-inch thick removable concrete slabs. Two openings for ladder access are provided. The ceiling slab has no rating.

This zone communicates with the radwaste pipe tunnel through mechanical and ventilation penetrations.

Supply air is ducted into the general areas of this zone and then induced through the nonaccessible cubicles into the pipe tunnel. Temperature is maintained between 65° F and 104° F in the general area and between 65° F and 122° F in the nonaccessible cubicles.

Safety-Related Equipment

This zone does not contain any safety-related equipment.

Protection Criteria and Measures

Automatic sprinkler protection is provided for the bale storage area and the truck bay area. Backup manual fire protection equipment is also provided.

Combustible Materials

The combustible materials in this zone consist of cable insulation, ventilation seals, lube oil, and compacted low level radioactive waste.

Fire Loading

The average fire loading for this zone, including a transient load equivalent to 55 gallons of lube oil, is 9320 Btu/ft^2. This is negligible.

Protection Criteria and Measures

This zone does not normally contain combustibles; therefore, only manual fire protection equipment is provided.

Combustible Materials

This zone does not normally contain combustible materials.

Fire Loading

There is no fire load in this zone.

Extinguishing and Detecting Capabilities

Manual fire protection consists of two firehose stations each with 75 feet of 1 1/2-inch UL listed and one Class 2A-20B:C portable fire extinguisher.

Design-Basis Fire

There is normally no combustible material in this zone to burn.

Planned Modifications

No modifications are required in this zone.

H.3.6.5 Radwaste Pipe Tunnel - Fire Zone 6C

Description

All walls of this zone are structural reinforced concrete, which are keyed and doweled into the slab. They vary in thickness from 12 inches to 48 inches.

The floor slab at elevation 677 feet-0 inch and the ceiling slab at elevation 687 feet-0 inch are both 48-inch thick structural reinforced concrete.

In the northeast corner and southeast corner of the pipe tunnel there are stairways. The stairway walls which are common with the pipe tunnel are 43 5/8-inch thick concrete block walls and 36-inch concrete. The concrete block wall extends up to within 1 inch of the ceiling slab. In the space at the top of the wall there is a thermafiber fire seal. For access to the stairways there are UL labeled "B" fire doors with certified frames. Both stairways have a 2-hour fire rating.

The stairway in the west area of the pipe tunnel has nonfire rated doors. At elevation 677 feet-0 inch the stairway has no fire rating. This stairway extends up to elevation 687 feet-0 inch, fire zone 6D, where it is enclosed by 3-hour fire walls and a UL labeled "A" fire door.

Fire Loading

See Subsection H.3.6.4.

Extinguishing and Detecting Capabilities

Manual fire protection consists of two Class 2A-20B:C portable fire extinguishers.

Design-Basis Fire

See Subsection H.3.6.4.

Planned Modifications

No modifications are required in this zone.

H.3.6.6 Elevation 687 feet-0 inch - Fire Zone 6D

Description

All structural reinforced concrete walls are keyed and doweled into the slab above. All concrete block walls at the boundaries of this zone extend up to within 1 inch of the ceiling slab. The space is filled with a thermafiber fire seal.

The north and south walls, common with fire zones 5D4 and 5D3 respectively, are 48-inch thick concrete. Each wall has a pair of UL labeled "A" fire doors. These walls have a 3-hour fire rating. ↖ with frames judged consistent with the wall ratings.

The walls in the northeast and southeast areas of this zone, which are common with fire zones 5B2 and 5B1 respectively, are a minimum 56-inch thick concrete. Common to each fire zone is a 55 5/8-inch thick section of concrete block. These walls have a 3-hour fire rating.

The portion of the east wall, common to fire zone 6E, is 43 5/8-inch concrete block. It has a minimum 3-hour rating.

The portion of the east walls, common to fire zone 5D5, are 11 5/8-inch thick concrete block. All doors located in these walls are UL labeled "A" fire doors. These walls have a 3-hour fire rating. ↖ with frames judged consistent with the wall rating.

The west wall is 48-inch thick concrete. It has a minimum 3-hour fire rating.

The floor slab at elevation 687 feet-0 inch is 24-inch to 48-inch thick structural reinforced concrete.

The ceiling slab of this zone, which is a portion of the floor slab of fire zone 5C11, is at elevation 710 feet-6 inches. It is a structural reinforced concrete slab which varies in thickness from 26 inches to 48 inches. This slab is not fire rated.

The elevator shaft in this zone is enclosed by 11 5/8-inch concrete block with a UL labeled "B" fire door. The elevator shaft has a 2-hour fire rating. The stairway in this zone is enclosed by a minimum 11 5/8-inch concrete block with a UL labeled "A" fire door with a frame judged consistent with the wall rating. The stairway has a 3-hour fire rating.

This zone comprises the 687 feet-0 inch elevation of the liquid radwaste building and includes both nonaccessible cubicles and a general area. It is isolated from adjacent turbine building; however, it communicates with the radwaste pipe tunnel. Supply air is ducted into the general area, induced into the nonaccessible cubicles and then into the pipe tunnel. Temperature is maintained between 65° F and 104° F in the general area and between 65° F and 122° F in the nonaccessible cubicles.

Safety-Related Equipment

This zone does not contain any safety-related equipment.

Protection Criteria and Measures

Because of the low combustible loading and lack of safety-related equipment, fire protection is not provided for the structural steel, and only manual fire protection equipment and floor drains are provided. Ionization detectors are provided for this zone.

Combustible Materials

Combustible materials in this zone consists of cable insulation, ventilation seals and gaskets, and lubrication oil.

Fire Loading

The average fire loading for this zone, including a transient fire loading equivalent to 55 gallons of lube oil, is 42,200 Btu/ft^2. This is equivalent to a fire severity of approximately 1/2 hour.

Extinguishing and Detecting Capabilities

Ionization detectors are provided in cable areas to sound an alarm in the control room. Manual fire protection consists of three firehose stations each with 75 feet of 1 1/2-inch UL listed hose, two firehose stations each with 50 feet of 1 1/2-inch UL listed hose, four Class 2A-20B:C portable fire extinguishers.

Design-Basis Fire

The design-basis fire in this zone would not affect any safety-related equipment.

Planned Modifications

No modifications are required in this zone.

H.3.6.7 Elevation 663 feet-0 inch - Fire Zone 6E

Description

All barrier walls of this fire zone are a minimum 42-inch thick structural reinforced concrete, which are keyed and doweled into the slab above.

For access to fire zones 5E1 and 5E2 there are two pairs of UL labeled "A" fire doors with certified frames. For access to fire zones 5B1 and 5B2 there are two nonfire rated watertight doors which are required for flood protection. All walls have a 3-hour fire rating.

Stairways are located in the northeast and southeast corners of this zone. Each stairway is enclosed by 7 5/8-inch concrete block with a UL labeled "B" fire door. At the top of the block wall there is a fire seal. The stairway has a 2-hour fire rating.

In the west area of the zone there is a stairway enclosed by 11 5/8-inch concrete block with a nonfire rated door. The stairway has no fire rating.

The elevator shaft in this zone is enclosed by 11 5/8-inch concrete block with a UL labeled "B" fire door. The elevator shaft has a 2-hour fire rating.

This zone comprises the liquid radwaste area at elevation 663 feet-0 inch and consists primarily of individual tank and pump cubicles. The zone is isolated from adjacent turbine building areas by fire rated walls; however, it communicates with the radwaste pipe tunnel. Supply air is ducted into the general area, induced into the various nonaccessible cubicles and then into the pipe tunnel. Temperature is maintained between 65° F and 104° F in the general area and between 65° F and 104° F in the nonaccessible cubicles.

Safety-Related Equipment

This zone ~~does not contain any safety-related equipment.~~ Contains MSIV leakage Control system instrument panels and Leakage Control pressure transmitters. ~~Which are designated~~

H.3.7.4 HPCS Diesel-Generator Room - Fire Zone 7B1

Description

The south wall of this zone is an exterior wall. It is 12 inch thick structural reinforced concrete.

The east wall is an interior wall common to fire zone 7B2 (Division 2 standby diesel-generator room). The wall is 12-inch thick structural reinforced concrete. In this wall is a UL labeled "A" fire door for access between the diesel-generator rooms. ↑ with a certified frame

The north and west walls of this zone are interior walls common to the turbine building ground floor. The walls are 12-inch thick structural reinforced concrete.

Located in the north wall is a motor-operated rolling steel UL labeled "A" fire door for access to the corridor. All walls in this zone have a minimum 3-hour fire rating, and all structural steel is fire protected for a minimum 3-hour rating. ↓ with a certified frame

In the southwest corner of the room is the HPCS day tank room, fire zone 7B4. For a complete description of this zone, see Subsection H.3.7.7.

At the west side of the room the ceiling slab is at elevation 731 feet-0 inch, and is 24-inch thick structural reinforced concrete. The roof slab for the remainder of the room is at elevation 736 feet-6 inches and is 12-inch thick structural reinforced concrete. Both slabs have no access openings and are supported by fire protected steel beams and columns. All walls are doweled and keyed into the ceiling slabs. The ceiling slab has a minimum 3-hour fire rating.

The floor slab (at elevation 710 feet-6 inches) is 8-inch thick finished concrete on a minimum of 24-inch thick structural reinforced concrete. There is a 2-foot 6-inch by 3-foot 0-inch floor hatch provided for access to the fuel tank room, fire zone 7C1, below. The hatch is a watertight closure consisting of 1/4 inch checkered plate with a 22 gauge steel liner. There are three floor drains provided in this zone. With the exception of the floor hatch, which is required by OSHA as a secondary exit, the floor slab has a 3-hour fire rating.

The HPCS diesel-generator room is provided with a separate fan system with fire dampers through fire barriers. A high temperature alarm isolates the ventilation system by shutting off the fan and closing the dampers. Remote manual control switches are provided to independently purge the room with 100% outdoor air.

H.3.7.5 Division 2 Standby Diesel-Generator Room - Fire Zone 7B2

Description

The north wall of this zone is an interior wall common to the turbine building ground floor corridor. The wall is 12-inch thick structural reinforced concrete. Located in the wall are two doors, one of which is a motor-operated rolling steel door. They are both UL labeled "A" fire doors (the pass door has a certified frame).

The east wall of this zone is an interior wall common to fire zone 7B3 (Division 1 standby diesel-generator room). The wall is 12-inch thick structural reinforced concrete with no steel columns located along or in it. There are two UL labeled "A" doors in this wall with certified frames. This wall has a 3-hour fire rating. Along the east wall at the south end is the Division 2 diesel day tank room, fire zone 7B5. For a complete description of this area see Subsection H.3.7.8.

The south wall of this zone is an exterior wall. It is 12-inch thick structural reinforced concrete with no access openings.

The west wall is an interior wall common to fire zone 7B1 (HPCS diesel-generator room). The wall is 12-inch thick structural reinforced concrete. In this wall is a UL labeled "A" fire door with a certified frame for access between the diesel-generator rooms.

The ceiling slab of the room (at elevation 736 feet-6 inches) is 12-inch thick structural reinforced concrete, has no access openings, and is supported by fire protected steel beams and columns. All walls are doweled and keyed into the ceiling slab. There is also a 5-foot 6-inch by 6-foot 0-inch by 5-inch thick removable concrete slab in the ceiling.

The floor slab at elevation 710 feet-6 inches is 8-inch thick finished concrete on a minimum of 24-inch thick structural reinforced concrete. A 2-foot 6-inch by 3-feet 0-inch floor hatch is provided for access to the Division 2 diesel fuel tank room (fire zone 7C2) below. The hatch is a watertight closure consisting of 1/4-inch checkered plate with a 22 gauge steel liner. There are two floor drains provided in this zone. With the exception of the floor hatch, which is required by OSHA as a secondary exit. The ceiling slab, floor slab, and all walls have a minimum 3-hour fire rating. All structural steel is fire protected to a minimum 3-hour rating.

The Division 2 standby diesel-generator room is provided with a separate fan system with fire dampers through fire barriers. A high temperature alarm isolates the ventilation system by shutting off the fan and closing the dampers. Remote manual

Planned Modifications

No modifications are required in this zone.

H.3.7.6 Division 1 Standby Diesel-Generator Room - Fire Zone 7B3

Description

The north wall of this zone is an interior wall common to the turbine building ground floor corridor. The wall is 12-inch thick structural reinforced concrete. Located in the wall are two doors, one of which is a motor-operated rolling steel door. They are both UL labeled "A" fire doors (the pass door has a certified frame).

The east and south walls are exterior walls which are 12-inch thick structural reinforced concrete. There are no access openings in these walls.

The west wall is an interior wall common to the Division 2 standby diesel-generator room. The wall is 12-inch thick structural reinforced concrete with no steel columns located in or along it. Located in the wall are two doors which are UL labeled "A" fire doors with certified frames.

Along the west wall at the south end is the Division 1 diesel day tank room. For a complete description of this zone, see Subsection H.3.7.9.

The ceiling slab of the room (at elevation 736 feet-6 inches), is 12 inch thick structural reinforced concrete, has no access openings, and is supported by fire protected steel beams and columns.

The floor slab at elevation 710 feet-6 inches is 8-inch thick finished concrete on a minimum of 24-inch thick structural reinforced concrete. A 2-foot 6-inch by 3-foot 0-inch floor hatch is provided for access to the Division 1 diesel fuel tank room below. The hatch is a watertight closure consisting of 1/4-inch checkered plate with a 22 gauge steel liner. There are two floor drains provided in this zone. With the exception of the floor hatch, which is required by OSHA as a secondary exit. The ceiling slab, floor slab, and all walls have a minimum 3-hour fire rating. All structural steel is fire protected to a minimum 3-hour rating.

The Division 1 standby diesel-generator room is provided with a separate fan system with fire dampers through fire barriers. A high temperature alarm isolates the ventilation system by shutting off the fan and closing the dampers. Remote manual control switches are provided to independently purge the room with 100% outdoor air.

Safety-Related Equipment

This zone contains the diesel fuel storage tank for the HPCS diesel generator which is used for standby power to the HPCS pump in case of a loss of offsite power.

Protection Criteria and Measures

Automatic sprinkler protection with water flow alarm is provided to prevent a serious fire from occurring. Curbing is used to contain oil from a tank leak or rupture and two sump pumps are provided. The sump pumps discharge to an outside oil separator. Fire walls are used to limit the spread of fire to other areas.

Combustible Materials

The primary combustible material consists of number 2 diesel oil.

Fire Loading

The average fire loading for this zone is 4,900,000 Btu/ft^2. A transient fire load is not considered.

Extinguishing and Detecting Capabilities

An extra hazard sprinkler system is provided for this zone. Actuation of the sprinkler system due to high temperature sounds an alarm locally and in the control room. Manual protection consists of one Class 2A-20B:C portable fire extinguisher and one firehose station with 50 feet of 1 1/2-inch UL listed firehose.

Design-Basis Fire

For a fire to occur in this zone there must be a leak or rupture in this Section III seismically supported oil tank and piping. This is extremely unlikely. Sprinkler protection is provided to prevent a fire in this zone from spreading to adjacent zones.

Planned Modifications

No modifications are required in this zone.

H.3.7.11 Division 2 Diesel Fuel Tank Room - Fire Zone 7C2

Description

All walls and slabs in this zone are structural reinforced concrete and are doweled and keyed into the ceiling slab. All walls have a 3-hour fire rating.

The north wall is common to the Division 2 RHR service water pump room, fire zone 7C5. It is 24 inches thick, and located in it, at elevation 680 feet 6 inches, is a UL labeled "A" fire door, with a certified frame.

Extinguishing and Detecting Capabilities

An extra hazard sprinkler system is provided for this zone. Actuation of the sprinkler system due to high temperature sounds an alarm locally and in the control room. Manual protection consists of two Class 2A-20B:C portable fire extinguishers and two firehose stations with 50 feet of 1 1/2-inch UL listed firehose.

Design-Basis Fire

For a fire to occur in this zone there must be a leak or rupture in this Section III seismically supported oil tank and piping. This is extremely unlikely. Sprinkler protection is provided to prevent a fire in this zone from spreading to adjacent zones.

Planned Modifications

No modifications are required in this zone.

H.3.7.12 Division 1 Diesel Fuel Tank Room - Fire Zone 7C3

Description

All walls and slabs in this zone are structural reinforced concrete and are doweled and keyed into the ceiling slab. All walls have a 3-hour fire rating.

The north wall is common to the Division 1 RHR service water pump room, fire zone 7C6. It is 24 inches thick, and located in it, at elevation 680 feet-6 inches, is a UL labeled "A" fire door, with a certificate of compliance.

The west wall, which is common to the Division 2 diesel fuel tank room, is 24 inches thick with no access openings.

The south and east walls of this zone are 48 inch thick foundation walls.

The ceiling slab (at elevation 710 feet-6 inches) is a minimum thickness of 24 inches. There is a 2-foot 6-inch by 3-foot 0-inch hatch provided for access to the Division 1 standby diesel-generator room above. The hatch is a watertight closure consisting of a 1/4-inch checkered plate with a 22 gauge steel liner. With the exception of the hatch, which is required by OSHA as a secondary exit, the ceiling slab has a minimum 3-hour fire rating.

The floor slab is at elevation 674 feet-0 inch and is 8-inch finished concrete on a 48-inch thick structural reinforced concrete mat foundation. There are two floor drains provided.

on the diesel's instrumentation causing the diesel to malfunction.

Planned Modifications

No modifications are required in this zone.

H.3.8.3 HPCS Diesel-Generator Room - Fire Zone 8B1

Description

The north wall of this zone is an exterior wall. It is 12-inch thick structural reinforced concrete.

The east wall is an interior wall common to the Division 2 standby diesel-generator room. The wall is 12-inch thick structural reinforced concrete. In this wall is a UL labeled "A" fire door with a certified frame for access between the diesel-generator rooms.

The south and west walls of this zone are interior walls common to the turbine building ground floor corridor. The walls are 12-inch thick structural reinforced concrete.

Located in the south wall with a certified frame is a motor-operated rolling steel UL labeled "A" fire door for access to the corridor. All structural steel is fire protected for a minimum 3-hour rating.

All walls in this zone have a minimum 3-hour fire rating.

In the northwest corner of the HPCS diesel-generator room is the HPCS diesel-day tank room, fire zone 8B3. For a complete description of this zone, see Subsection H.3.8.5.

At the west side of the room the ceiling slab is at elevation 731 feet-0 inch, and is 24-inch thick structural reinforced concrete. The ceiling slab for the remainder of the room is at elevation 736 feet-6 inches and is 12-inch thick structural reinforced concrete. Both slabs have no access openings and are supported by fire protected steel beams and columns. All walls are doweled and keyed into the ceiling slabs. The ceiling slab has a minimum 3-hour fire rating.

The floor slab (at elevation 710 feet-6 inches) is 8-inch thick finished concrete on a minimum of 24-inch thick structural reinforced concrete. There is a 2-foot 6-inch by 3-foot 0-inch floor hatch provided for access to the fuel tank room, fire zone 8C1, below. The hatch is a watertight closure consisting of a 1/4-inch checkered plate with a 22 gauge steel liner. There are three floor drains provided in this zone. With the exception of the floor hatch, which is required by OSHA as a secondary exit, the floor slab has a 3-hour fire rating.

UL labeled "A" door with a certified frame provides access through the south wall to the HPCS diesel pump room.

The west wall of this zone is an interior wall common to the Division 1 RHR service water pump room. The wall is 24-inch thick structural reinforced concrete, equivalent to a 3-hour fire rating. The wall extends up to and is doweled to the ceiling slab at elevation 710 feet-6 inches. There are no access openings in this wall.

The ceiling slab at elevation 710 feet-6 inches is a structural reinforced concrete slab with a minimum thickness of 24 inches. There is a 2-foot 6-inch by 3-foot 0-inch hatch provided for access to the HPCS diesel-generator room. The hatch is a watertight closure consisting of 1/4-inch checkered plate with a 22 gauge steel liner. With the exception of the hatch, which is required by OSHA as a secondary exit, the ceiling slab has a 3-hour fire rating.

The floor slab is at elevation 674 feet-0 inch and is 8 inches of finished concrete on a 48-inch thick structural reinforced concrete mat foundation. There are two floor drains provided. A 6-foot curbing is provided to contain the oil in the room should the tank leak or rupture. A sump is provided with two 50 gpm pumps to remove any drainage that may accumulate in this room or those rooms above it in the diesel-generator building.

This zone is ventilated through a separate exhaust fan which is located outside of this zone. Fire dampers are provided through fire barriers. The exhaust fan is manually operated by a remote individual control switch.

Safety-Related Equipment

This zone contains the diesel fuel storage tank for the HPCS diesel generator which is used for standby power to the HPCS pump in case of a loss of offsite power.

Protection Criteria and Measures

Automatic sprinkler protection is provided to prevent a serious fire from occurring. Curbing is used to contain oil from a tank leak or rupture and two sump pumps are provided. The sump pumps discharge to an outside oil separator. Fire walls are used to limit the spread of fires to other areas.

Combustible Materials

The primary combustible material consists of number 2 diesel oil.

Fire Loading

The average fire loading for this zone is 4,920,000 Btu/ft². A transient fire load is not considered.

Extinguishing and Detecting Capabilities

An extra hazard sprinkler system provided for this zone. Actuation of the sprinkler system due to high temperature sounds an alarm locally and in the control room. Backup manual protection consists of one Class 2A-20B:C portable fire extinguisher and one firehose station with 50 feet of 1 1/2-inch UL listed firehose.

Design-Basis Fire

For a fire to occur in this zone there must be a leak or rupture in this Section III seismically supported oil tank and piping. This is extremely unlikely. Sprinkler protection is provided to prevent a fire in this zone from spreading to adjacent zones.

Planned Modifications

No modifications are required in this zone.

H.3.8.8 Division 2 Diesel Fuel Tank Room - Fire Zone 8C2

Description

The north and east walls of this zone are 48-inch thick foundation walls. There is a ladder on the north wall that ascends to a platform attached to the north wall at elevation 691 feet-7 inches and continues up through the ceiling slab at elevation 710 feet-6 inches. The wall has a 3-hour fire rating.

The south wall of this zone is an interior wall common to the Division 2 RHR service water pump room. This wall is 24-inch thick structural reinforced concrete, equivalent to a 3-hour fire rating. The wall extends up and is doweled into the ceiling slab at elevation 710 feet-6 inches. A gallery stair ascends to a platform attached to the south wall at elevation 680 feet-6 inches where a UL labeled "A" door provides access through the south wall to the Division 2 RHR service water pump room. with a certified frame

The west wall of this zone is an interior wall common to the HPCS diesel fuel tank room. The wall is 24-inch thick structural reinforced concrete, equivalent to a 3-hour fire rating. The wall extends up and is doweled into the ceiling slab at elevation 710 feet-6 inches. There are no access openings in this wall.

The ceiling slab at elevation 710 feet-6 inches is a 24-inch structural reinforced concrete slab. There is a 2-foot 6-inch by 3-foot 0-inch hatch provided for access to the Division 2 standby

H.3.9 Fire Area 9: Service Building

The service building is adjacent to the Unit 2 turbine building. It has been divided into nine zones for the purpose of the fire hazards analysis. These zones are listed in Table H.2-1 and shown on Figure H.2-1. Each zone is discussed below. Table H.3-1 lists the safety-related and radioactive equipment within each zone, and Table H.3-2 summarizes the combustible hazards and fire fighting capabilities present.

H.3.9.1 Upper Ventilation Equipment Room - Fire Zone 9A

Description

The north, west, and a portion of the east wall are exterior walls consisting of insulated fluted metal siding. The walls are supported by unprotected steel beams, girts, and columns. In the west wall there are louvers and a door for access onto the roof deck of the service building. These walls have no rating.

The portion of the east wall common with the turbine building (fire zone 5B6) is 11 5/8-inch concrete block with a thermafiber fire seal located at the top of the wall. The roof decking of zone 9A at elevation 764 feet-1 inch extends to this block wall. Located in the wall is a UL labeled "A" fire door with a frame judged consistent with the wall rating. There is 3-hour fire protection on the column, beams, and vertical bracing along and within the wall. This wall has a 3-hour fire rating.

The south wall, common with fire zone 5B6, is a minimum 16-inch thick structural reinforced concrete, which extends up beyond the roof decking. Along this wall is a vent opening. The vent opening is enclosed on the north, east, and west sides by 7 5/8-inch concrete block with a thermafiber fire seal located at the top of the wall. There are three openings in the vent enclosure walls which are framed with a 1/4-inch bent plate. On the turbine building side of the wall there are protected columns, beams, and vertical bracing. The wall has a 3-hour rating. The walls around the vent opening have a 2-hour fire rating.

The floor slab of this zone, which is also the ceiling slab of the office and locker areas, fire zone 9B, and the machine shop, fire zone 9C1, is at elevation 742 feet-10-1/2 inches. It consists of 6-inch thick structural reinforced concrete on 1 1/2-inch by 18 gauge metal decking supported by exposed steel. There is an area approximately 1⅓ feet-0 inch by 7 feet-0 inch which consists of 5-inch thick removable structural reinforced concrete slabs framed with steel. At the south wall there is a 1-inch space between the floor slab and the concrete wall. There is a 18 gauge sheet metal bent plate used as a closure. Three floor drains are provided. Around the vent openings there is a minimum 4-inch high concrete curb. The floor slab is not fire rated.

H.3.10 Off-Gas Building - Units 1 and 2

The off-gas building is common to Units 1 and 2. It has been divided into nine zones for the purpose of the fire hazards analysis. These zones are listed in Table H.2-1 and shown on Figure H.2-1. Each zone is discussed in the following. Table H.3-1 lists the safety-related and radioactive equipment within each zone, and Table H.3-2 summarizes the combustible hazards and fire fighting capabilities present.

H.3.10.1 Off-Gas Building Ventilation Room - Fire Zone 10A1

All barrier walls of this zone are structural reinforced concrete. They are keyed and doweled into the floor and roof slabs. The south and east walls are 12 inches thick and have nonfire rated doors. These walls have no fire rating.

The north wall is 18 inches thick and has a UL labeled "A" fire door for access to the equipment access airlock. This wall has a 3-hour fire rating.

The west wall, common to the reactor building, is 24 inches thick and has a UL labeled "A" fire door with a certified frame. The wall has a 3-hour fire rating.

Along the west wall there is a stairway. The other walls enclosing the stairwell are 7 5/8-inch thick concrete block. Access is by a nonfire rated door. The stairway has no fire rating.

Both the floor and roof slabs are structural reinforced concrete. The floor slab, at elevation 710 feet-6 inches, is 24 inches thick. The roof slab, at elevation 726-feet 6 inches, is 12-inch thick concrete with a built-up UL Class "A" roof covering. Due to the nonfire rated stairway, the floor slab has no fire rating.

This zone comprises the HVAC equipment room at elevation 710 feet-6 inches and is ventilated from the off-gas filter building ventilation system. This system is a once-through type which operates continuously and uses 100% outdoor air. The air is mechanically cooled or heated to maintain the design temperature range within each area of the building. A separate exhaust system is provided to exhaust the air to the atmosphere through the station vent stack. This zone is maintained between 65° F and 104° F on a year-round basis.

Safety-Related Equipment

This zone contains safety-related cable trays, but only divisional associated cables are contained within the trays.

ENCLOSURE 3

U1 Cable Spreading Room (CSR)

The design basis of the fire protection system for the U1 CSR is to protect the cables in the cable trays that traverse the room. To this end engineering:

1. designed a water spray system (closed head, pre-action) to extinguish a fire and control burning,

2. designed a fire detection system,

3. secured insurance for the room from NML,

4. purchased solid bottom cable trays (with the exception of drain holes) to prevent the propagation of cable fires (NUREG/CR-0381 (SAND 78-1456)),

5. designed LaSalle such that in the unlikely event of a fire that completely destroyed the CSR there is an alternate path whereby U1 could be brought to a safe cold shutdown (documented in App. H to the FSAR).

The FSAR lists the design bases as follows:

Pg. 9.5-1	... purpose is to <u>suppress</u> a fire ...
Pg. 9.5-6	Applicable Codes and Standards: 29 CFR 1910 29 CFR 1926 10 CFR 50 NFPA - Fire Prevention Standards NML - Property Loss Prevention Standards ASTM - D992-56
Pg. 9.5-8	fixed water spray systems are designed to NFPA-15
SPEC J-2910	Fixed spray system is designed for fire extinguishment.

The following report provides the engineering analyses to justify two exceptions from code regarding the design and installation of the CSR fire protection system:

3.A. Location of detectors (NFPA 72E)
3.B. Spray density (NFPA-15).

ENCLOSURE 3.A

Location of Detectors

The location and spacing of smoke detectors in the CSR resulted from an evaluation based on engineering judgment as supplemented by the guidelines of NFPA 72E. The detectors are not located within 4"-12" from the ceiling.

Original engineering drawings noted that the location of the detectors would be "field located". This decision was based on the facts that the design was conservative in terms of numbers of detectors and that the intent was to protect the cable trays. The judgment to actually locate the detectors was to include the physical shape and contents of the CSR to estimate which way smoke might actually go and install the detectors to intercept the smoke.

The "as-built" drawings (beam location only on FS-9348-1; and FS-9269-6) attached to this report show where the detectors, and how many, are installed.

Engineering concludes that the design and current installation are consistent with the intent of the code and that the CSR is protected.

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