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October 30, 1984
5211-84-2263

Office of Nuclear Reactor Regulation
Attn: John F. Stolz, Chief
Operating Reactors Branch No. 4
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Request for Exemption from the Requirements of
10CFR50 Appendix R as They Relate to Fire Area
Versus Fire Zone

By letter dated November 30, 1983, GPUN requested exemption from 10CFR50 Appendix R to the extent that fire zones, previously approved under Branch Technical Position 9.5.1 Appendix A, could be utilized as the basis for determining compliance with the fire area separation criteria established in 10CFR50 Appendix R. Representatives of GPUN met with the NRC staff on June 2, 1984 and again on August 14, 1984 to discuss the basis for exemption and to clarify staff concerns pertaining to granting such exemption for TMI-1. During the August 14 meeting, GPUN presented proposed evaluation criteria that would be utilized in performing a supplemental analysis to support the adequacy of the previously defined fire zone boundaries. Upon concurrance by the staff, GPUN agreed to provide the supplemental analysis, which would also address additional staff concerns expressed during the meetings, by the end of September; however, it was not possible to meet this schedule as explained in a telephone conversation with Mr. Harley Silver on October 1, 1984. It was agreed to provide the supplemental analysis by October 30, 1984.

GPUN has now completed the supplemental analysis of the fire zone boundries defined in the November 30, 1983 letter. The results of this analysis are presented in the enclosed revision (Enclosure A) of Section 1.3 of the TMI-1 Fire Hazards Analysis and Appendix IIIG, Safe Shutdown Evaluation. Each of the zone boundaries was evaluated in accordance with the criteria presented to the staff during the August 14 meeting. Where the boundaries did not meet the criteria, additional modifications (summarized in Enclosure B) are proposed to bring the boundary into conformance with the criteria, or technical justification is provided demonstrating the adequacy of the boundary even though strict conformance with the criteria is not obtained.

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The existing zone boundaries and the proposed modifications provide reasonable assurance that any postulated fire will not extend beyond the zone boundaries defined. This conclusion is based on defense in depth principals consisting of various combinations of passive barriers to fire propagation, low fire loadings within the zone, early warning fire detection capabilities, automatic fire suppression in areas of higher risk, fire brigade response capability and manual fire suppression equipment provided throughout the facility.

The enclosed revision delineates the specific fire protection features within each fire zone to demonstrate the adequacy of the zone boundries. Based on this evaluation and the proposed modifications, exemption from the requirements of 10CFR50, Appendix R as it relates to the definition of fire areas is requested. The protective features of the fire zones provide an acceptable alternative to Appendix R configurations.

This revision to the fire zone boundary evaluation has necessitated a change in commitment with regard to Fire Zone AB-FZ-4. Initially, the deluge water spray system within this zone was initiated automatically; however, an exemption to convert this system to manual actuation was requested by letter dated April 8, 1983, and subsequently granted in the NRC Safety Evaluation Report dated June 4, 1984. In order to provide adequate protection of the zone boundary in this area, it has been found necessary to convert this system to a preaction system and re-establish the automatic actuation feature. The exemption was requested in order to minimize the possibility of water damage due to inadvertent actuation. Generally, automatic actuation of water systems is limited to only those areas where such actuation provides a significant benefit in protecting safe shutdown equipment since inadvertent actuation represents a potential hazard to all plant equipment in the zone. Due to the necessity of protecting the zone boundaries of fire zone AB-FZ-4, automatic actuation of the existing system will be re-established. Such actuation of the system will not affect the water damage study presented in Section 6.0 of the Fire Hazards Analysis Report and Appendix 111G Safe Shutdown Evaluation in that the actuation of this system will not effect redundant safe shutdown systems.

This submittal provides additional information pertaining to the November 30, 1983 exemption request; therefore, the application fee was provided pursuant to 10CFR170.22 at the time of application. For ease of review, this submittal includes all information provided in the original application as well as the supplemental analysis requested.

Sincerely,

H. D. Hukill
Director, TMI-1

lr/0443e
Enclosures
cc: J. Van Vliet
T. V. Wambach

Directions for Incorporating Changes to
Three Mile Island Unit 1
Fire Hazard Analysis Report and Appendix R, Section 111G
Safe Shutdown Evaluation

Replace Pages	with	Enclosed Pages*
1.2-14		1.2-14 through 1.2-19
1.3-1 through 1.3-57		1.3-1 through 1.3-100

*Changes are indicated by a bar in the margin labeled R6.

Enclosure A

1.3 Delineation of Fire Areas/Fire Zones

The purpose of this section is to provide the technical basis for clarification of TMI-1 exemption requests from the requirements of Appendix R to 10CFR50.

The updated TMI-1 Plant Fire Hazards Analysis, which was submitted with the Appendix R Section III,G Safe Shutdown Evaluation utilized an identical delineation of fire areas and fire zones as had initially been utilized in analyzing the effects a fire would have on the plant's capability to safely shutdown. The following are the definitions of a fire area and fire zone as provided in Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants."

"Fire Area -

That portion of a building or plant that is separated from other areas by boundary fire barriers (walls, floors or roofs) with any opening or penetrations protected with seals or closures having a fire resistance rating equal to that of the barriers.

Fire Zones -

Subdivisions of fire areas in which the fire suppression systems are designed to combat particular types of fires. The concept of fire zone aids in defining to the fire fighter the fire parameters and the actions which would be necessary."

Initially, the plant was analyzed based upon the guidelines established by Appendix A to BTP APCSB 9.5-1. The delineation of fire areas was established taking into consideration the location of redundant safety related components with respect to each other, existing building construction and the presence of in-situ fire hazards. For the purposes of analysis, certain fire areas were subdivided into fire zones taking into consideration the physical boundaries which exist between one fire zone and another within the same fire area. In the current fire area/zone arrangement, further support for the subdivision of fire areas into fire zones is obtained by the augmentation of the plant fire protection system which has been achieved due to the modifications which were made as a result of the NRC's safety evaluation report with respect to the initial plant fire hazards analysis; e.g., fire zone boundaries bounded by fixed suppression systems. It should be noted that Appendix R suggests evaluation of the plant on a fire area basis while Appendix A to BTP APCSB 9.5-1 did not specifically require fire area separation of safe shutdown components.

The following criteria will be utilized in evaluating the adequacy of fire zone boundaries which permits analysis to determine compliance with Appendix R, Section IIIG of fire zones by themselves.

In general, only those boundaries which are not continuous wall to wall, floor to ceiling boundaries of fire rated construction will be addressed. Those boundaries which are of rated construction and controlled as rated boundaries are addressed where they constitute a portion of a fire zone

R6

boundary or where a justification is required for a specific penetrating element which is unrated. Justification of fully rated fire area boundaries is not the subject of this assessment. In addition, boundaries in fire areas not adjacent to any other fire area or fire zone is not the subject of this assessment. Those boundaries in fire zones which are adjacent to other fire areas or fire zones will be addressed as described below.

A. Examination beyond an evaluation of existing active and passive features is not required to support justification of the following zone boundaries:

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1. Any zone boundary which is not adjacent to other fire zones or areas. Basis - no interaction.

2. Any zone boundary which is protected by automatic fire suppression on at least one side of the boundary.

3. Any zone boundary contained within the area served by a common automatic suppression system.

B. Further examination of a zone boundary as described below not meeting the criteria of A above will establish acceptability provided the combustible loading on either side of that zone boundary is less than 40,000 Btu/ft^2.

1. The zone boundary consists of non-rated physical boundaries with penetrations sealed with non-combustible material or

2. The zone boundary is not relied on to separate/protect redundant trains of safe shutdown equipment on either side of that zone boundary or

3. Partial non-rated barriers and separation distance provide adequate physical horizontal separation where vertical separation is not a concern.

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Where the assessment identifies a zone boundary which does not fall under items A & B above, modifications will be proposed such that the zone boundary in question falls under at least one of the six categories (A.1-3/B.1-3), unless the uniqueness of a configuration can be supported by a fire protection evaluation.

The specific fire zones under consideration which have been analyzed as a fire area are as follows:

Item		Fire Zone/Area	Location/Elevation	Plant FHA Section
I	1.	AB-FZ-1	Aux. Bldg. (Heat Exchanger Vault)/271'	4.2.3.1
I	2.	AB-FZ-2A	Aux. Bldg. (Make-Up Pump A Cubicle)/281'	4.2.3.2
I	3.	AB-FZ-2B	Aux. Bldg. (Make-Up Pump B Cubicle)/281'	4.2.3.2
I	4.	AB-FZ-2C	Aux. Bldg. (Make-Up Pump C Cubicle)/281'	4.2.3.2
I	5.	AB-FZ-3	Aux. Bldg. (Make-Up Valve Gallery)/281'	4.2.3.3

Item	Fire Zone/Area	Location/Elevation	Plant FHA Section
I 6.	AB-FZ-4	Aux. Bldg. (Penetration Area)/281'	4.2.3.4
I 7.	AB-FZ-5	Aux. Bldg. (General Area)/281'	4.2.3.5
I 8.	AB-FZ-6	Aux. Bldg. (Demineralizers & ESV-CC1A)/305'	4.2.3.6
I 9.	AB-FZ-6a	Aux. Bldg. (ESV-CC1B)/305'	4.2.3.6a
I 10.	AB-FZ-7	Aux. Bldg. (DHR & NSCCC Pumps)/305'	4.2.3.7
I 11.	AB-FZ-8	Aux. Bldg. (Waste Gas Decay Tanks)/305'	4.2.3.8
I 12.	AB-FZ-9	Aux. Bldg. (Rem. El. 305')	4.2.3.9
I 13.	FH-FZ-1	Fuel Hand. Bldg. (Basement)/281'	4.7.1
I 14.	FH-FZ-2	Fuel Hand. Bldg./El. 305'	4.7.2
I 15.	FH-FZ-3	Fuel Hand. Bldg./329' & 331'	4.7.3
I 16.	FH-FZ-4	Fuel Hand. Bldg./Fuel Pool Area	4.7.4
I 17.	FH-FZ-5	Fuel Hand. Bldg. (Control Bldg. Patio Area)/322' - 380'	4.7.5
I 18.	FH-FZ-6	Fuel Hand. Bldg. (Chiller Rm)/285'	4.7.6
I 19.	CB-FZ-5A	Control Bldg. (North H&V Equip. Area)/380'	4.4.15
I 20.	CB-FZ-5B	Control Bldg. (South H&V Equip. Area)/380'	4.4.16
I 21.	AB-FA-1	Aux. Bldg. (Decay Heat Removal Pit A)/261'	4.2.1
I 22.	AB-FA-2	Aux. Bldg. (Decay Heat Removal Pit B)/261'	4.2.2
II 1.	IB-FZ-1	Int. Bldg. (Valve Gallery & Penet. Rm)/295'	4.3.1
II 2.	IB-FZ-2	Int. Bldg. (Turb. Driven EFW Pump Room)/295'	4.3.2
II 3.	IB-FZ-3	Int. Bldg. (Mtr. Driven EFW Pump Room)/295'	4.3.3
II 4.	IB-FZ-4	Int. Bldg. (Rem. of El. 295')	4.3.4

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Item	Fire Zone/Area	Location/Elevation	Plant FHA Section
II 5.	IB-FZ-5	Int. Bldg. (Corridor)/305'	4.3.5
II 6.	IB-FZ-6	Int. Bldg. (General Area)/322'	4.3.6
II 7.	IB-FZ-7	Int. Bldg. (General Area)/355'	4.3.7
II 8.	IB-FZ-8	Int. Bldg. (Alligator Pit)/279'-0"	4.3.8
III 1.	ISPH-FZ-1	Int. Screen & Pump Hse (1R SWGR Area)/308'	4.6.1
III 2.	ISPH-FZ-2	Int. Screen & Pump Hse (1T SWGR Area)/308'	4.6.2
III 3.	ISPH-FZ-3	Int. Screen & Pump Hse (Trash Rake & Screen Area)/308'	4.6.3
IV 1.	CB-FA-2a	Cont. Bldg. (1P Switchgear Rm.)/322'	4.4.2
IV 2.	CB-FA-2b	Cont. Bldg. (1S Switchgear Rm.)/322'	4.4.3
IV 3.	CB-FA-3a	Cont. Bldg. (4160V Switchgear 1D Area)/338'	4.4.9
IV 4.	CB-FA-3b	Cont. Bldg. (4160V Switchgear 1E Area)/338'	4.4.10
IV 5.	CB-FA-3d	Cont. Bldg. (Control Bldg. Relay Room Area/338'	4.4.12
V 1.	RB-FZ-1a	Reactor Building - El. 281'-0"	4.1.1
	RB-FZ-1b	Reactor Building - El. 281'-0"	4.1.2
	RB-FZ-1c	Reactor Building - El. 281'-0"	4.1.3
V 2.	RB-FZ-1d	Reactor Building - D-Rings	4.1.6
	RB-FZ-1e	Reactor Building - D-Rings	4.1.7
V 3.	RB-FZ-2	Reactor Building - El. 308'-0"	4.1.4
V 4.	RB-FZ-3	Reactor Building - El. 346'-0"	4.1.5

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I Auxiliary & Fuel Handling Buildings and Control Building (H&V Equipment Rm).

The Auxiliary and Fuel Handling Buildings and Control Building H&V Equipment Rooms are classified as one fire area which has been subdivided into 20 fire zones for the purpose of analysis. Each fire zone is treated independently and analyzed as a fire area due to the construction feature of its boundaries and/or existing or proposed active fire detection and suppression systems installed on either or both sides of the zone boundary. In addition, two fire areas in the Auxiliary Building (Decay Heat Removal Pits) are discussed here as the ceilings of each fire area, which are maintained as three hour rated fire barriers, are provided with steel equipment access hatches which are not rated. The following is a brief description of the zone boundaries for each zone, the zones active fire protection features, and the combustible loadings on either side of the nonfire rated zone boundaries. Categorization of the zone boundaries is designated, as per the category description discussed in the introduction of this section, in a summary at the end of each section. R6 R6

1. AB-FZ-1 - Heat Exchanger Vault - E. 271'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The south and west walls and the floor are not adjacent to any other plant areas. The upper portion of the east wall is adjacent to fire zone AB-FZ-5. Penetrations through this wall are detailed on ATT.A SH.1. The remainder is not adjacent to any

other plant area. A portion of the north wall is adjacent to fire zone AB-FZ-5 via a stairwell. The ceiling is a three hour rated barrier. A fire detection system is being installed over cable trays in this zone and will alarm in the control room. Combustible loadings on either side of the nonfire rated zone boundary are: R6

a. AB-FZ-1 - 2400 Btu/ft (2 min)*

b. AB-FZ-5 - 20,062 Btu/ft (15 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations is sealed with kaowool to preclude a slow burning cable fire from propagating through the zone boundary although the seal is not fire rated. The only unsealed penetration is the HVAC penetration which lacks a fire damper. R6

This zone boundary is not relied on to protect redundant trains of safe shutdown equipment on either side of the boundary. Valve circuits for valves listed in Section 4.2.3.1 (also Section 3.10) located within zone AB-FZ-1 will not be protected as time is available for manual operation; therefore interaction across the zone boundary is not a concern (Ref. Sections 1.2.2C and 3.2.3.1). R6

* The figures in parentheses adjacent to all combustible loadings represent a corresponding gauge with respect to anticipated fire severity in time when assuming total consumption of combustibles and comparing them to the ASTM-E-119 time temperature curve.

The reinforced concrete walls in this zone provide a formidable barrier to fire propagation even though the walls are not fully rated. The fire load within this zone is negligible; therefore, should a fire occur it would be of insufficient duration and intensity to propagate across the zone boundaries to adjacent zones even though a limited number of unsealed penetrations exist. Furthermore, since there is no redundant safe shutdown equipment in adjacent zones, the plant's ability to safely shutdown is not in jeopardy. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
B2	A1	B2	A1	A1	Rated

2. AB-FZ-2A - Make-up Pump A Cubicle - El. 281'

Three-hour rated fire barriers are provided on the north, south and east walls as well as the ceiling except as noted in the following. Note that two penetrations for reach rods for R6

valve operators through the east wall are not fully sealed. Reach rod penetrations consist of 2 1/2-inch core bores with 2 inch diameter rods equipped with steel collars covering the openings in the wall. All other penetrations in these walls are controlled and maintained with three-hour rated fire seals. The floor is not adjacent to any other plant area. The west boundary consists of reinforced concrete around the door section. The remainder of the wall is solid concrete block all sealed to a three-hour fire rating. (Reference ATT.A SH.2.) The door and the frame are not labeled. The door is equipped with a ventilation grille. Since the ventilation system draws air into this zone from AB-FZ-5 which is common to all three make-up pump cubicles, the door will be replaced with a grilled door equipped with a damper held open by a fusible link. The west boundary is adjacent to fire zone AB-FZ-5. A fire detection system, which alarms in the control room, is provided for zone AB-FZ-2a. Combustible loadings on either side of the nonfire rated zone boundary are: R6 R6

a. AB-FZ-2a - 59,996 Btu/ft^2 (45 min)

b. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

Note that fire zone AB-FZ-5 is a large zone. The location adjacent to fire zone AB-FZ-2a is essentially devoid of combustibles.

A large portion of this boundary is of 3 hour rated construction and the unrated portions of the boundary consist of the floor, an unrated door assembly, and reach rod penetrations. The floor area R6

is not adjacent to any other plant area and the reach rod area and penetrations are relatively small with a configuration that significantly retards the passage of flame, smoke and hot gases. Although the door is not rated, providing a heat controlled damper will retard fire propagation. The installed fire detection system that provides early warning of a fire condition assures rapid response by the plant fire brigade. Therefore, those features provided to retard fire propagation and the response of the plant fire brigade will assure the fire is contained within the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	*Rated	B1	A1	Rated

*Rated except for reach rod penetrations.

3. AB-FZ-2B - Make-up Pump B Cubicle - El. 281'

Three-hour rated fire barriers are provided on the north, south and east walls as well as the ceiling except as noted in the following. Note that two penetrations for reach rods for valve R6

operators through the east wall are not fully sealed. All other penetrations in these walls are controlled and maintained with three-hour rated fire seals. Each reach rod penetration consists of a 2-1/2-inch core bore with 2-inch diameter rod equipped with a steel collar covering the openings in the wall. Note also that a duct penetration in the south wall is not equipped with a fire damper. Since the fire loadings between zones AB-FZ-2b and 2c are low (both 13 min. or less), and the outside of the duct through the penetration in the south boundary is sealed, the existing configuration of the south wall is adequate. The floor is not adjacent to any other plant area. The west boundary consists of reinforced concrete around the door section. The remainder of the wall is solid concrete block sealed to a three-hour fire rating. (Ref. ATT.A SH.3.) The door and frame are not labeled. The door is equipped with a ventilation grille. Since the ventilation system draws air into this zone from AB-FZ-5 which is common to all three make-up pump cubicles, the door will be replaced with a grilled door equipped with a damper held open by a fusible link. The west boundary is adjacent to fire zone AB-FZ-5. A fire detection system which alarms in the control room is provided in zone AB-FZ-2b. Combustible loadings on either side of the nonfire rated zone boundary are:

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a. AB-FZ-2b - 16,663 Btu/ft^2 (13 min)

b. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

Note that fire zone AB-FZ-5 is a large zone. The location adjacent to fire zone AB-FZ-2b is essentially devoid of combustibles.

This fire zone is bounded by concrete walls, of which most are three hour fire rated, with minimal penetrations. The configuration of the penetrations significantly retards the passage of flame, smoke and hot gases. Although the door assembly into the area is not rated, providing a fusible link controlled damper will provide an additional barrier to fire propagation. These measures in conjunction with the low fire loading provides assurance that fires will be contained within the zone boundaries. Furthermore, an early warning fire detection system is provided to assure rapid response of the plant fire brigade. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	*Rated	**Rated	B1	A1	Rated

* Duct penetration not equipped with fire damper.

**Rated except for reach rod penetrations.

4. AB-FZ-2c - Make-Up Pump C Cubicle - El. 281'

Three-hour rated fire barriers are provided on the north, south and east walls as well as the ceiling except as noted in the following. Note that two penetrations for reach rods for valve operators through the east wall are not fully sealed. The reach rod penetration consists of a 2-1/2-inch core bore with 2-inch diameter rod equipped with a steel collar covering the opening at the wall. Note also that one duct penetration in the north wall, one duct penetration in the east wall and two duct penetrations in the south wall are not equipped with fire dampers. Since the fire loadings between zones AB-FZ-2b and 2c are low (both 13 min. or less) and between AB-FZ-2c and AB-FZ-5 are low (15 min. max.) and the outside of the ducts through these penetrations are sealed and controlled, the existing configurations of the north, south and east boundaries are adequate. All other penetrations in these walls are controlled and maintained with three-hour rated fire seals. The floor is not adjacent to any other plant area. The west boundary consists of reinforced concrete around the door section. The remainder of the wall is solid concrete block wall all sealed to a three-hour fire rating. (Ref. ATT.A SH.37 for penetration details.) The door and frame are not labeled. The door is equipped with a ventilation grille. Since the ventilation system draws air into this zone from AB-FZ-5 which is common to all three make-up pump cubicles, the door will be replaced with a grilled door equipped with a damper held open by a fusible link. R6 R6

with a damper held open by a fusible link. The west boundary is adjacent to fire zone AB-FZ-5. A fire detection system which alarms in the control room is provided for zone AB-FZ-2c. Combustible loadings on either side of the non fire rated zone boundary are: R6

a. AB-FZ-2c - 15,363 Btu/ft^2 (12 min)

b. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

Note that fire zone AB-FZ-5 is a large zone. The location adjacent to fire zone AB-FZ-2c is essentially devoid of combustibles.

This fire zone is bounded by concrete walls, of which most are 3 hour rated, with minimal penetrations. The configuration of the penetrations significantly retards tne passage of flame, smoke, and hot gases. Although the door assembly into the area is not rated, providing a fusible link controlled damper will provide an additional barrier to fire propagation. These measures in conjunction with the low fire loading provides assurance that fires will be contained within the zone boundaries. Furthermore, an early warning fire detection system is provided to assure rapid response of the plant fire brigade. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
*Rated	*Rated	**Rated	B1	A1	Rated

*Duct penetration not equipped with fire damper. R6

**Rated except for reach rod penetrations; duct penetration not equipped with fire damper.

5. AB-FZ-3 - Make-Up Valve Gallery - El. 281'

A three-hour rated fire barrier is provided on the west wall. Note that six penetrations for reach rods for valve operators through the west wall are not fully sealed. Each reach rod penetration consists of a 2-1/2-inch core bore with a 2-inch diameter R6 rod equipped with a steel collar covering the opening in the wall. In addition, a duct penetration in this wall adjacent to zone AB-FZ-2c is not provided with a fire damper. All other penetrations in this wall are controlled and maintained with three-hour rated fire seals. The floor is not adjacent to any other plant area. The south wall is constructed of reinforced concrete and is adjacent to fire zone AB-FZ-5. (Ref. ATT.A SH.5 for penetration details.) However, this boundary is not relied upon to protect redundant trains of safe shutdown equipment on R6 either side of the boundary. The east wall is constructed of reinforced concrete and is adjacent to fire zone FH-FZ-1. (Ref. ATT.A. SH.6 & 7 for penetration details.) In addition, zone FH-FZ-1 is provided with an automatic wet pipe

sprinkler system. The ceiling is constructed of reinforced concrete and is adjacent to fire zone AB-FZ-6. (Ref. ATT.A. SH.8 for penetration details.) However, this boundary is not relied upon to protect redundant trains of safe shutdown equipment on either side of the boundary. The north boundary is adjacent to fire zone AB-FZ-4; there is no construction separating the zones. Fire zone AB-FZ-4 is currently protected by a manually actuated deluge water spray system and a fire detection system which alarms in the control room. However, this system will be converted to an automatically actuated preaction system. A fire detection system which alarms in the control room is provided in fire zone AB-FZ-3. Combustible loadings on either side of each nonfire rated zone boundary are as follows: R6 R6

a. AB-FZ-3 - 4581 Btu/ft^2 (4 min)
b. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)
c. FH-FZ-1 - 38,954 Btu/ft^2 (29 min)
d. AB-FZ-6 - 30,404 Btu/ft^2 (23 min)
e. AB-FZ-4 - 52,822 Btu/ft^2 (40 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations are sealed with kaowool to preclude a slow burning cable fire from propagating through the zone boundary although the seals are not fire rated. The ionization detection system will alarm in the R6

control room. The automatic fire suppression system on the opposite side of the east boundary in zone FH-FZ-1 and the modification to the existing manual deluge water spray system in zone AB-FZ-4 to an automatic preaction system will preclude propagation of fire across the east and north boundaries respectively. The south boundary and the ceiling are not relied upon to protect redundant trains of safe shutdown equipment.

All boundaries, with the exception of the north boundary, within this zone are of substantial construction providing an effective barrier to fire propagation. Those boundaries which are relied upon to separate redundant safe shutdown equipment are either rated or automatic water suppression systems are installed on at least one side of the boundary to prevent fire propagation. The deluge water spray system in fire zone AB-FZ-4, adjacent to the north boundary, will be converted to an automatically actuated preaction system to prevent fire propagation across the boundary. These features in conjunction with the low fire load and the early warning fire detection system assures the containment of potential fires. Additionally, transient combustibles in this area are minimal which substantially reduces the probability of a rapid development of a fire situation. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described

in the introduction to this section. The classification of each boundary in this zone is presented below:

R6

Walls				Floor	Ceiling
North	South	East	West		
A2	B2	A2	*Rated	A1	B2

*Rated except for reach rod penetrations and duct penetration not equipped with fire dampers.

6. AB-FZ-4 - Penetration Area - El. 281'

A three-hour rated fire barrier is provided on the south boundary where adjacent to the make-up pump cubicle and on the north boundary which is adjacent to the Reactor Building. A portion of the south boundary adjacent to zone AB-FZ-3, the east boundary adjacent to zone FH-FZ-1, and the west boundary adjacent to zone AB-FZ-5 is not separated by wall construction. Zone AB-FZ-4 is currently protected by an ionization fire detection system which alarms in the control room and a manually actuated deluge water spray system. This system will be converted to an automatically actuated preaction system. In addition, zone FH-FZ-1 on the east boundary is protected by an automatic wet pipe sprinkler system as well as an ionization fire detection system which alarms in the control room. The floor of this zone over fire areas AB-FA-1, AB-FA-2 and fire zone IB-FZ-8 is a three-hour rated fire barrier with the exception of two 1/2-inch thick steel equipment hatches

R6

which are unrated over fire area AB-FA-2; however, all other penetrations where adjacent to fire areas AB-FA-1, AB-FA-2 and IB-FZ-8 are controlled and maintained with three-hour rated fire seals. The hatches are monitored daily to assure that they are kept closed. The remainder of the floor is not adjacent to any other plant area. The ceiling consists of reinforced concrete with an open stairwell adjacent to zone AB-FZ-6; the remainder of the ceiling consists of reinforced concrete adjacent to zone AB-FZ-7. (Ref. ATT.A. SH.9 for ceiling penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows: R6

a. AB-FZ-4 - 52,822 Btu/ft^2 (40 min)
b. AB-FZ-3 - 4,581 Btu/ft^2 (4 min)
c. FH-FZ-1 - 38,954 Btu/ft^2 (29 min)
d. AB-FZ-6 - 30,404 Btu/ft^2 (23 min)
e. AB-FZ-7 - 7,626 Btu/ft^2 (6 min)
f. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, the ionization detection system will provide early warning of a fire in this zone and the conversion of the existing manually actuated deluge water spray system to an automatically actuated preaction system will prevent propagation of fire across the zone boundaries. R6

The existing water suppression system in this zone will be converted to an automatic preaction system in order to rapidly extinquish fires in their early stages. This feature will prevent fire propagation across the open boundaries and all other boundaries are of rated construction with controlled penetrations. An early warning fire detection system provides for rapid response by the plant fire brigade to further assure the containment of any fire that may occur. Furthermore, since the bulk of the fire load is cable insulation, the probability of a rapid propagation of fire is minimized allowing sufficient time for fire brigade response to control the fire within the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated/A2	A2	A2	*B1/A2	A2

*Rated except for steel equipment access hatches.

7. AB-FZ-5 - General Area - El. 281'

A three-hour rated fire barrier is provided on the south wall of this zone. The north boundary is not adjacent to any other plant

area. The east boundary adjacent to the Fuel Handling Building (zone FH-FZ-1) is constructed of reinforced concrete (note passage from the Auxiliary Building to the Fuel Handling Building is through an opening in this boundary); however, an automatic wet pipe sprinkler system is located on the FH-FZ-1 side of this boundary. (Ref. ATT.A. SHS.10 & 11 for penetration details.) The boundary adjacent to zone AB-FZ-3 is reinforced concrete. However, this boundary is not relied upon to protect redundant trains of safe shutdown equipment on either side of the boundary. (Ref. ATT.A. SH.5 for penetration details.) The south boundary of zone AB-FZ-2C is three-hour fire rated. Note that two duct penetrations in this boundary are not provided with fire dampers. Since the fire loadings between zones AB-FZ-2C and AB-FZ-5 are low (15 min. max.) and the outside of these penetrations are sealed and controlled, the existing configuration of this boundary is adequate. The east boundary of this zone adjacent to fire zones AB-FZ-2A, AB-FZ-2b and AB-FZ-2C is constructed of reinforced concrete around each door section. The remainder of the boundary is solid concrete block. The doors and frames are not labeled. Each door is equipped with a ventilation grille. Since the ventilation system draws air from this zone into each make-up pump cubicle, each door will be replaced with a grilled door equipped with a damper held open by a fusible link. (Ref. ATT.A SH.10 for penetration details.) The portion of the east boundary adjacent to zone AB-FZ-4 does not consist of wall construction; however, this portion of the boundary is currently protected by an ionization

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fire detection system and a manually actuated deluge water spray system which will be converted to an automatically actuated pre-action system. The west boundary of this zone consists of reinforced concrete, a portion of which is not adjacent to any other plant area and a portion of which is adjacent to zone AB-FZ-1. (Ref. ATT.A. SH.12 for penetration details.) A fire detection system is being installed adjacent to the north boundary of zone AB-FZ-5 and in zone AB-FZ-1 However, this boundary is not relied upon to protect redundant trains of safe shutdown equipment. R6

The floor of this zone is not adjacent to any other plant area except over fire areas AB-FA-1 and AB-FA-2 where the floor is a three hour rated fire barrier with the exception of two 1/2 inch thick steel equipment access hatches which are unrated over fire area AB-FA-2. However, all other penetrations where adjacent to fire areas AB-FA-1 and AB-FA-2 are controlled and maintained with three-hour rated fire seals. The steel hatches are monitored daily to assure they are kept closed. R6

The ceiling of this zone consists of reinforced concrete and is adjacent to fire zones AB-FZ-6, AB-FZ-6A, AB-FZ-7, AB-FZ-8 and AB-FZ-9. Zones AB-FZ-6 and 6A above will be separated from each other by a one-hour fire barrier in order to separate ES MCC 1A (AB-FZ-6) from ES-MCC 1B (AB-FZ-6A) The ceiling of fire zone AB-FZ-4 is adjacent to ES MCC 1A. This zone boundary will be R6

protected by an automatically actuated preaction system in AB-FZ-4. Any smoke or hot gases penetrating through the ceiling as a result of a fire in AB-FZ-5 will not migrate towards ES MCC 1A as any penetrations in AB-FZ-5 where adjacent to fire zone AB-FZ-6 between the south wall of AB-FZ-6a and column line 7d as well as between column lines K and L (refer to Fire Area Layout 1-FHA-027) will be sealed with noncombustible material. Any smoke or hot gases originating in AB-FZ-5 where adjacent to AB-FZ-6 will not migrate to ES MCC-1A due to a wall running east/west along column 7d between columns J and K (again refer to #1-FHA-027) which has a limited number of penetrations (note this is a radiation shield wall). The remainder of the ceiling of AB-FZ-5 is not relied upon to protect redundant safe shutdown components on either side. (Reference ATT.A. SH.13 for penetration details.) As stated previously, a fire detection system which will alarm in the control room is being provided in the north end of this zone which is the only portion of this zone where safe shutdown circuits are routed. R6

Combustible loadings on either side of each nonfire rated boundary are as follows:

a. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

b. FH-FZ-1 - 38,954 Btu/ft^2 (29 min)

c. AB-FZ-3 - 4,581 Btu/ft^2 (4 min)

d. AB-FZ-2a - 59,966 Btu/ft^2 (45 min)

e. AB-FZ-2b - 16,663 Btu/ft² (13 min)

f. AB-FZ-2c - 15,363 Btu/ft² (12 min)

g. AB-FZ-4 - 52,822 Btu/ft² (40 min)

h. AB-FZ-6 - 30,404 Btu/ft² (23 min)

i. AB-FZ-6a - 1,448 Btu/ft² (0 min) R6

j. AB-FZ-7 - 7,626 Btu/ft² (6 min)

k. AB-FZ-8 - 0 Btu/ft² (0 min)

l. AB-FZ-9 - 27,451 Btu/ft² (21 min)

m. AB-FZ-1 - 2,400 Btu/ft² (2 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seal is not fire rated. Note that not all penetrations are sealed with kaowool. R6

The boundary adjacent to fire zone FH-FZ-1 is provided with an automatic wet pipe sprinkler system located in FH-FZ-1. The boundary adjacent to fire zone AB-FZ-4 will be provided with an automatic preaction system. The boundary adjacent to AB-FZ-2a, 2b, and 2C will be provided with doors equipped with dampers held open by fusible links. The boundary adjacent to zones AB-FZ-3, 6, 6a, 7, 8, 9 and 1 are not relied upon to protect redundant trains of safe shutdown equipment with the exception of a portion of the R6

boundary adjacent to AB-FZ-6 which will be sealed with noncombustible material. The boundary adjacent to fire area AB-FA-1 is sealed with a 1/2-inch thick steel hatch plate, the remainder of this boundary is sealed to a three-hour fire rating.

All boundaries enclosing this zone, with the exception of a portion of east boundary, are of rated or concrete construction providing a substantial barrier to fire propagation. Significant penetrations are sealed or controlled to prevent the spread of smoke and hot gases. Additional modifications, as described above, will be installed to further assure the integrity of the zone boundaries separating safe shutdown equipment. These features in conjunction with the early warning fire detection system and the preaction automatic suppression system in zone AB-FZ-4 which protects the open portion of the east boundary, assures that fires will not propagate across the zone boundaries separating redundant safe shutdown equipment. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
A1/B2*	Rated	A2/B1	A1/B2**	A1/Rated***	B1/B2

* B2 where adjacent to AB-FZ-3, rated where adjacent to AB-FZ-2C with the exception of two duct penetrations which lack fire dampers. R6

** B2 where adjacent to AB-FZ-1

***Rated except for steel equipment access hatch.

8. AB-FZ-6 - Demineralizer and ESV-CC1A - El. 305'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The south boundary and portion of the ceiling are not adjacent to any other plant areas. The remainder of the ceiling adjacent to the chemical addition area is a three-hour fire barrier. Most of the north boundary is adjacent to fire zone AB-FZ-7 with an open passage between the zones. However, this boundary is not relied upon to separate redundant safe shutdown components from each other. R6 The remainder of the north boundary is adjacent to the Reactor Building which is a three-hour rated fire barrier. (Ref. ATT.A. SH.14 for penetration details.) The east boundary is adjacent to the fuel handling building with two open passages between the zones. However, this boundary is not relied upon to separate redundant safe shutdown components from each other. (Ref. ATT.A. SH.15 & 16 for penetration details.) The west boundary is adjacent to fire zone AB-FZ-9 with an open passage between the zones. (Ref. ATT.A. SH.17 & 18 for penetration details.) R6

However, this boundary is not relied upon to separate redundant trains of safe shutdown components from each other. The west boundary is also adjacent to fire zone AB-FZ-6a with a one hour fire barrier to be added as part of the Appendix R modifications. Note that the penetration of the Reactor Purge Exhaust duct through this barrier will not be provided with a fire damper. This duct work is substantial in construction (10 gauge stainless steel). The construction is adequate to withstand the effects of a fire. Note that penetrations around the periphery of this duct will be sealed to a one hour fire rating and controlled as such. R6

The floor is adjacent to fire zones AB-FZ-5, AB-FZ-3 and AB-FZ-4. (Ref. ATT.A. SH.19 for penetration details.) A three-hour rated fire barrier is provided on the floor where this zone is adjacent to fire zones AB-FZ-2a, AB-FZ-2b and AB-FZ-2c. A fixed manual deluge water spray system which will be converted to an automatic preaction system is located where the floor of this zone is adjacent to fire zone AB-FZ-4. Penetrations through a portion of the floor where adjacent to AB-FZ-5 (see AB-FZ-5 for details) will be sealed with non-combustible material. The remainder of the floor is not relied upon to separate redundant trains of safe shutdown equipment from each other. An ionization detection system which alarms in the control room is provided in this zone over safety related switchgear. Combustible loadings on either side of each nonfire rated zone boundary are as follows: R6

a. AB-FZ-6 - 30,404 Btu/ft^2 (23 min)

b. AB-FZ-7 - 7,626 Btu/ft^2 (6 min)

c. AB-FZ-3 - 4,581 Btu/ft^2 (4 min)

d. AB-FZ-4 - 52,822 Btu/ft^2 (40 min)

e. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

f. FH-FZ-2 - 20,732 Btu/ft^2 (16 min)

Note: Reference is not made to zone FH-FZ-1 as the zone boundaries on the east wall are boundaries between reinforced concrete ventilating duct chases.

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seal is not fire rated. Where cable tray penetrations are not sealed, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire. R6

All boundaries enclosing this zone are of rated or concrete construction providing a substantial barrier to fire propagation. Additional modifications as described above will be installed to assure the integrity of those boundaries separating redundant safe R6

shutdown equipment. Significant penetrations are sealed to prevent the spread of smoke and hot gases across the zone boundaries separating safe shutdown equipment. These features in conjunction with the early warning fire detection system assures that fires will be contained within the zone boundaries.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this action. The classification of each boundary in this zone is presented below: R6

Walls				Floor	Ceiling
North	South	East	West		
B2/Rated	A1	B2	B2/Rated*	Rated/A2/B2	A1/Rated

*Rated with the exception of a fire damper in Reactor Purge Exhaust duct penetration.

9. AB-FZ-6a - ES MCC B - El. 305'

Zone boundaries consist of reinforced concrete walls on the north and west walls. The east and south boundary adjacent to zone AB-FZ-6 will be provided with a one hour fire barrier. Note that the penetration of the Reactor Purge Exhaust duct through the east barrier will not be be provided with a fire damper. This duct work is substantial in construction (10 gauge stainless steel). The construction is adequate to withstand the effects of a fire. R6

Note that penetrations around the periphery of this duct will be sealed to a one hour fire rating and controlled as such.

The north wall is adjacent to zone AB-FZ-7. Although this wall contains unsealed penetrations, the fire load in this zone is negligible, therefore, the existing boundary is adequate (Note: fire load specified in Section 4, page 4a.2.3 - 6a is incorrect. Corrected value is 1448 Btu/ft^2.). The west wall is adjacent to fire zone AB-FZ-9 with an open passage to zone AB-FZ-9. This boundary is not relied upon to protect redundant trains of safe shutdown equipment. (Ref. ATT.A. SH.21 & 22 for penetration details.) The floor is constructed of reinforced concrete and is adjacent to fire zone AB-FZ-5. (Ref. ATT.A. SH.23 for penetration details.) However, this boundary is not relied upon to separate redundant trains of safe shutdown equipment. The ceiling is constructed of reinforced concrete and is a three hour rated fire barrier. An ionization detection system which alarms in the control room is provided in this zone as well as adjacent zone AB-FZ-7. Combustible loadings on either side of each nonfire rated zone boundary are as follows: R6 R6 R6

a. AB-FZ-6a - 1,448 Btu/ft^2 (0 min)
b. AB-FZ-7 - 7,626 Btu/ft^2 (6 min)
c. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)
d. AB-FZ-9 - 27,451 Btu/ft^2 (21 min)

All boundaries enclosing this zone are of rated or concrete construction providing a substantial barrier to fire propagation. The fire load in this zone is negligible consisting of only concrete coating. A fire in this zone would be of insufficient intensity and duration to propagate across the zone boundaries. These features in conjunction with the early warning fire detection system assures that fires will be contained within the zone boundaries.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below: R6

Walls				Floor	Ceiling
North	South	East	West		
**B3	Rated	*Rated	B2	B2	Rated

*Rated with the exception of a fire damper in Reactor Purge Exhaust Duct penetration.

**Spatial separation in conjunction with low fire load assures fire containment.

10. AB-FZ-7 - DHR & NSC CC Pumps - El. 305'

Zone boundaries consist of reinforced concrete walls, floor and ceiling with an open passage in the south boundary between this zone and zone AB-FZ-6. However, this boundary is not relied upon to separate redundant trains of safe shutdown equipment. The north boundary is not adjacent to any other plant area. The east boundary is adjacent to the Reactor Building which is a three-hour rated fire barrier. The west boundary is adjacent to zone AB-FZ-9. However, this boundary is not relied upon to separate redundant trains of safe shutdown equipment. (Ref. ATT.A. SH.24 for penetration details.) The south boundary is adjacent to zones AB-FZ-6, AB-FZ-6a, and AB-FZ-9. The boundary adjacent to fire zone AB-FZ-6a will be sealed to provide a rating of one hour. The boundary adjacent to fire zones AB-FZ-6 and AB-FZ-9 is not relied upon to separate redundant trains of safe shutdown equipment. (Ref. ATT.A. SH.25 for penetration details.) The floor is adjacent to zones AB-FZ-4 and AB-FZ-5. A fixed manual deluge water spray system which will be converted to an automatic preaction system is located where the floor of this zone is adjacent to fire zone AB-FZ-4. The boundary adjacent to fire zone AB-FZ-5 is not relied upon to separate redundant trains of safe shutdown equipment from each other. (Ref. ATT.A. SH.26 for penetration details.) The ceiling is not adjacent to any other plant areas. An ionization detection system which provides separate alarms for

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each pump cubicle in the control room is provided in this zone. Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. AB-FZ-7 - 7,626 Btu/ft^2 (6 min)
b. AF-FZ-6 - 30,404 Btu/ft^2 (23 min)
c. AB-FZ-6a - 1,448 Btu/ft^2 (0 min) R6
d. AB-FZ-9 - 27,451 Btu/ft^2 (21 min)
e. AB-FZ-4 - 52,822 Btu/ft^2 (40 min)
f. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

The principal combustible in this zone is cable insulation. Since the fire loading in zone AB-FZ-6a is above 40,000 Btu/ft^2, the portion of zone AB-FZ-7 south boundary adjacent to zone AB-FZ-6a will be sealed to a one-hour fire rating to prevent interaction between these two zones. R6

All boundaries enclosing this zone are of rated or concrete construction providing a substantial barrier to fire propagation. Additional modifications, as described above, will be installed to further assure the integrity of the zone boundaries protecting redundant safe shutdown equipment. The fire load in this zone is insignificant; therefore, should a fire occur it would be of insufficient duration and intensity to propagate across the zone boundaries.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling	
North	South	East	West			R6
A1	Rated/B2	Rated	B2	A2/B2	A1	

11. AB-FZ-8 - Waste Gas Decay Tanks - El. 305'

Zone boundaries consist of reinforced concrete walls, floor and ceiling with an open passage in the east boundary between this zone and zone AB-FZ-9. All wall boundaries are adjacent to zone AB-FZ-9. (Ref. ATT.A SHS.27-30 for penetration details.) The floor is adjacent to zone AB-FZ-5. (Ref. ATT.A SH.61 and GAI drawing E-422-018 for penetration details.) None of these boundaries is relied upon to protect redundant trains of safe shutdown equipment. The ceiling adjacent to the chemical addition area is a three-hour rated barrier. Combustible loadings on either side of each nonfire rated zone boundary are as follows: R6

a. AB-FZ-8 - 0 Btu/ft^2 (0 min)

b. AB-FZ-9 - 27,451 Btu/ft^2 (21 min)

c. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

The zone boundaries are not relied on to separate redundant safe shutdown equipment and the fire load within this zone is negligible. The zone boundaries are sufficient to prevent fire propagation across the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classifications in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below: R6

Walls				Floor	Ceiling
North	South	East	West		
B2	B2	B2	B2	B2	Rated

12. AB-FZ-9 - Rm. - El. 305'

Zone boundaries consist of reinforced concrete walls, floor and ceiling with an open passage in the north boundary between this zone and zone AB-FZ-6a and two open passages in the east boundary between this zone and zone AB-FZ-6. However, these boundaries are not relied upon to separate redundant trains of safe shutdown equipment from each other. Also, an open passage exists between this zone and zone AB-FZ-8. Again, boundaries to AB-FZ-8 are not R6 relied upon to separate redundant trains of safe shutdown equipment from each other. A portion of the north boundary, and the entire south boundary are not adjacent to any other plant area. The remainder of the north boundary is adjacent to fire zones AB-FZ-6a and AB-FZ-7 with an open passage to zone AB-FZ-6a. These boundaries are not relied upon to separate redundant trains of safe shutdown equipment from each other. (Ref. ATT.A. SH.32 for penetration details.) The west boundary is a three hour rated R6

fire barrier. The east boundary is adjacent to fire zone AB-FZ-6. (Ref. ATT.A. SH.33 for penetration details.) This zone completely surrounds zone AB-FZ-8 which is enclosed by reinforced concrete walls. (Ref. ATT.A. SHTS. 27-30 for penetration details.) The floor is adjacent to zone AB-FZ-5. The floor is not relied upon to separate redundant trains of safe shutdown equipment from each other. (Ref ATT.A. SH.34 and 35 for penetration details.) A portion of the ceiling adjacent to the chemical addition area is a three-hour fire rated barrier; the remainder of the ceiling is not adjacent to any other plant area. R6 R6

The principal combustible in this zone is activated charcoal which is contained in the filtration units for the Reactor Building Purge Exhaust and Auxiliary and Fuel Handling Exhaust systems located in the fan equipment room portion of this zone. All penetrations to the fan equipment room are sealed with non-combustible material with the exception of the ducts which are not provided with fire dampers. The units are provided with thermal detectors which alarm in the control room and manually actuated deluge water spray systems. Cable insulation is minimal in this zone. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with grout or kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seals are not fire rated. Where cable tray penetrations are not sealed, it is R6

reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire.

Combustible loadings on either side of each nonfire rated zone boundary as follows:

a. AB-FZ-9 - 27,451 Btu/ft^2 (21 min)
b. AB-FZ-8 - 0 Btu/ft^2 (0 min)
c. AB-FZ-6a - 1,448 Btu/ft^2 (0 min) R6
d. AB-FZ-6 - 30,404 Btu/ft^2 (23 min)
e. AB-FZ-7 - 7,626 Btu/ft^2 (6 min)
f. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

All boundaries enclosing this area are of rated or concrete construction providing a substantial barrier to fire propagation. The zone boundaries are not relied on to separate redundant safe shutdown equipment. The protection provided for the major combustible (charcoal) assures early warning and rapid response of the fire brigade to control the fire before propagating beyond the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
A1/B2	A1	B2	Rated	B2	A1/Rated

R6

13. FH-FZ-1 - Basement Elev. 281' - 0"

Zone boundaries consist of reinforced concrete walls, floor and ceiling. Most of the east boundary is not adjacent to any other plant area except for a three-hour rated fire barrier where adjacent to zone IB-FZ-8, and a nonfire rated boundary where adjacent to FH-FZ-6. A raceway which runs through the east wall to fire area CB-FA-1 in the east boundary of zone FH-FZ-1 is sealed to a three-hour fire rating. The north boundary is adjacent to the Reactor Building which is a three-hour fire rated barrier. The south and west boundary is a three-hour rated fire barrier where adjacent to the Air Intake Tunnel (AIT-FA-1). The remainder of the west boundary is adjacent to fire zones AB-FZ-3, AB-FZ-4 and AB-FZ-5. (Ref. ATT.A. SH.36 for penetration details.) An open passage exists between this zone and zone AB-FZ-5 and the boundary between this zone and zone AB-FZ-4 does not consist of wall construction; however, this zone (FH-FZ-1) is equipped with an automatic wet pipe sprinkler system and zone AB-FZ-4 is equipped with a manually actuated deluge water spray system which will be converted to an automatically actuated preaction system. The floor of this zone is not adjacent to any other plant area. The ceiling of this zone is adjacent to zone FH-FZ-2 and FH-FZ-4 (Ref.

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ATT.A. SHTS.37 & 38 for penetration details). Note that FH-FZ-4 is the fuel pool. Its boundary is not fire rated, but due to the nature of this zone, combustible loadings (combustible loading is on the operating floor between FH-FZ-2 and FH-FZ-4) will not be compared to each other. An ionization detection system which alarms in the control room is provided in this zone. Combustible loadings on either side of each zone boundary are as follows:

a. FH-FZ-1 - 38,954 Btu/ft^2 (29 min)

b. AB-FZ-3 - 4,581 Btu/ft^2 (4 min)

c. AB-FZ-4 - 52,822 Btu/ft^2 (40 min)

d. AB-FZ-5 - 20,062 Btu/ft^2 (15 min)

e. FH-FZ-2 - 20,732 Btu/ft^2 (16 min)

f. FH-FZ-6 - 3,484 Btu/ft^2 (3 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, the ionization detection system will provide early warning of a fire in this zone and the automatic suppression system will prevent propagation of fire across the zone boundaries. R6

A major portion of the boundary consists of 3 hour fire rated construction. The remaining walls provide a significant barrier to propagation. An automatic sprinkler system in this zone provides rapid extinguishment of a fire in its early stages which R6

provides protection where this zone is open to zone AB-FZ-4 (where an existing manual deluge system will be converted to an automatic pre-action system). The features provided in this zone in conjunction with the early warning detection system assure that fire, smoke and hot gases will not propagate across the zone boundaries.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below: R6

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	A1/A2/Rated	A2/Rated	A1	A2

14. FH-FZ-2 - Fuel Handling Building - Elev. 305'

Zone boundaries consist of concrete walls, floor and ceiling. The south boundary of this zone is three-hour fire rated except on the operating floor (348' elevation) which is common between TMI-1 and TMI-2. The west boundary is adjacent to fire zone AB-FZ-6 with two open passages between the zones; however, there is no safe shutdown equipment or cables in FH-FZ-2 for which redundant capability is located in AB-FZ-6. (Ref. ATT.A. SH.39 for penetration details.) The remainder of the west boundary is not adjacent to any other plant area. The boundaries between FH-FZ-2 and FH-FZ-4 (fuel pool) are R6

reinforced concrete (no penetrations) except on the operating floor where no boundaries exist; however, there is no safe shutdown equipment or cables in FH-FZ-2 for which redundant capability is located in FH-FZ-4 in the operating floor area. The boundaries between FH-FZ-2 and FH-FZ-3 are reinforced concrete. (Ref. ATT.A. SHTS. 49 & 50 for penetration details.) The east boundary of FH-FZ-2 in the control building patio (Hot Machine Shop) is a three-hour fire rated barrier except where adjacent to zone FH-FZ-4 (concrete wall with no penetrations). The north boundary for the Reactor and Turbine Buildings is a three-hour rated fire barrier. For the north boundary adjacent to the duct chase (FH-FZ-1) Ref. ATT.A. SH.40 for penetration details. R6 R6

The floor of this zone is adjacent to zone FH-FZ-1 (protected by an automatic wet pipe sprinkler system) and FH-FZ-6. (Ref. ATT.A. SHTS.42 & 43 for penetration details.) The remainder is not adjacent to any other plant area. The ceiling of this zone is adjacent to zones FH-FZ-3 and FH-FZ-5. (Ref. ATT.A. SHTS.44-47 & 50 for penetration details.) Note that the control building patio portion of FH-FZ-2 is provided with an automatic wet pipe sprinkler system where adjacent to FH-FZ-4, FH-FZ-5 and FH-FZ-6. The remainder of the ceiling is not adjacent to any other plant area. Combustible loadings on either side of each nonfire rated zone boundary are as follows: R6

a. FH-FZ-2 - 20,732 Btu/ft^2 (16 min)

b. AB-FZ-6 - 30,404 Btu/ft^2 (23 min)

c. FH-FZ-4 - 2,149 Btu/ft^2 (2 min)

d. FH-FZ-3 - 7,717 Btu/ft^2 (6 min)

e. FH-FZ-5 - 93,398 Btu/ft^2 (70 min)

f. FH-FZ-1 - 38,954 Btu/ft^2 (29 min)

g. FH-FZ-6 - 3,484 Btu/ft^2 (3 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles exposed cable in tray penetrations is sealed with kaowool to preclude a slow burning cable fire from propagating through the zone boundary, although the seal is not fire rated. Where cable tray penetrations are not sealed, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire.

The zone boundaries enclosing this zone are of rated or concrete construction providing a substantial barrier to fire propagation. The unrated boundaries are not relied upon to separate redundant safe shutdown equipment except where adjacent zones are protected with automatic suppression systems. These features in conjunction with the relatively low fire load assure that a fire will not propagate across the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

R6

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated*, B2	Rated+, B2	B2/A1	A2	A2, B2

*Except above 348'-0" +Except where adjacent to FH-FZ-4

15. FH-FZ-3 - Fuel Handling Building - El. 329' & 331'

Zone boundaries consist of reinforced concrete walls and a combination of grating and reinforced concrete for floors and ceilings. The west boundary consists of a three-hour rated fire barrier. The east boundary is adjacent to the fuel pool (no penetrations). The north boundary is adjacent to a ventilating duct chase (FH-FZ-1) and as such, combustible loadings between FH-FZ-3 and FH-FZ-1 will not be compared to each other. (Ref. ATT.A. SH.48 for penetration details.) A portion of the south boundary is adjacent to zone FH-FZ-2; the remainder being adjacent to an elevator shaft which is part of zone FH-FZ-1 and as such, combustible loadings between FH-FZ-3 and FH-FZ-1 will not be compared. (Ref. ATT.A. SH.49 for penetration details.) The floor is adjacent to zone FH-FZ-2 (Ref. ATT.A. SH.50) and the ceiling is

adjacent to zone FH-FZ-4. (Ref. ATT.A. SH.51 for penetration details.) No boundaries within this zone are relied upon to separate redundant trains of safe shutdown equipment on either side of the boundary. Combustible loadings on either side of the nonfire rated zone boundaries are as follows: R6

a. FH-FZ-3 - 7,717 Btu/ft^2 (6 min)

b. FH-FZ-2 - 20,732 Btu/ft^2 (16 min)

c. FH-FZ-1 - 38,954 Btu/ft^2 (29 min)

d. FH-FZ-4 - 2,149 Btu/ft^2 (2 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire

The zone boundaries are primarily of concrete construction providing a substantial barrier to fire propagation, however, the boundaries are not relied upon to separate redundant safe shutdown equipment. The fire load within this zone is minimal; therefore, a fire would not be of sufficient duration or intensity to propagate beyond the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described

in the introduction to this section. The classification of each boundary in this zone is presented below:

R6

Walls				Floor	Ceiling
North	South	East	West		
B2	B2	B2	Rated	B2	B2

16. FH-FZ-4 - Fuel Pool Area

Zone boundaries consist of reinforced concrete walls and ceiling except on the operating floor where no physical construction exists on the south boundary between this zone and zone FH-FZ-2; however, combustibles in FH-FZ-2 are concentrated on elevation 305, not on the operating floor, and this boundary is not relied upon to separate redundant trains of safe shutdown equipment from each other. Boundary construction and combustible loading is only discussed on the operating floor as the area below the operating floor for this zone is the fuel pool. A portion of the floor over zone FH-FZ-3 consists of reinforced concrete and grating. This boundary is not relied upon to separate redundant trains of safe shutdown equipment from each other. (Ref. ATT.A. SH.52 for penetration details.) A portion of the south boundary is adjacent to an elevator shaft (FH-FZ-1) and as such, combustible loading comparison between FH-FZ-4 and FH-FZ-1 will not be made. Most of the south boundary on the operating floor is a large high bay area open to the TMI-2 fuel handling building elevation 348'.

R6

R6

The east boundary of this zone is adjacent to zone FH-FZ-5. (Ref. ATT.A. SH.53 for penetration details.) An HVAC penetration on elevation 380' of the east boundary adjacent to fire zone FH-FZ-5 is not provided with a fire damper. Fire zone FH-FZ-5 fire loading exceeds 40,000 Btu/ft^2. However, the relative location of the combustibles in fire zone FH-FZ-5 with respect to this duct is sufficient to insure that flame propagation to elevation 380'-0" is unlikely and that the duct will remain intact to prevent the spread of smoke and hot gases from FH-FZ-5 into FH-FZ-4. The area between the duct and penetration will be sealed to prevent the spread of smoke and hot gases across the boundary. The west boundary of this zone is a three hour rated fire barrier. The ceiling and the north boundary are not adjacent to any other plant area. Combustible loadings on either side of the nonfire rated zone boundaries are as follows: R6 R6

a. FH-FZ-4 - 2,149 Btu/ft^2 (2 min)
b. FH-FZ-3 - 7,717 Btu/ft^2 (6 min)
c. FH-FZ-5 - 93,398 Btu/ft^2 (70 min)
d. FH-FZ-2 - 20,732 Btu/ft^2 (16 min)
e. TMI-2 operating floor - 19,744 Btu/ft^2 (15 min)

The principal combustibles in this zone are cable insulation and lube oil in negligible quantities. The lack of a fire damper in R6

the east boundary of this zone is not considered critical even though the loading in adjacent zone FH-FZ-5 is greater than 40,000 Btu/ft^2 as combustibles in FH-FZ-5 are concentrated approximately 30 feet below the duct penetration. Should ignition of cable occur either electrically or due to transient combustibles, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire. R6

The boundaries of this fire area are primarily of concrete construction providing a substantial barrier to fire propagation. The fire load in this area is insignificant; therefore, a fire within the zone would be of insufficient duration and intensity to propagate beyond the zone boundaries; however, the east boundary is adjacent to zone FH-FZ-5 which has a high fire loading. The duct penetration through this boundary will be sealed to prevent the spread of smoke and hot gases. These features assure the integrity of the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
A1	B2	B1*	Rated	**B2/B1	A1

*Duct penetration to be sealed around outside of penetration; no fire damper in duct; loading on one side greater than 40,000 Btu/ft^2. R6

**Fuel pool where not adjacent to FH-FZ-3.

17. FH-FZ-5 - Control Building Patio Area - Elev. 322' to 380'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north and south boundaries are three-hour fire rated barriers. The west boundary is adjacent to fire zones FH-FZ-2 and FH-FZ-4. (Ref. ATT.A. SH.54 for penetration details.) An HVAC penetration on elevation 380'-0" of the west boundary is not provided with a fire damper. R6 The east boundary is a three-hour rated fire barrier except on elevation 380' where adjacent to zones CB-FZ-5a and CB-FZ-5b. A major portion of the east boundary where adjacent to CB-FZ-5a and 5b consists of reinforced concrete. The remainder consists of unrated sheet metal walls with unlabelled doors at the entrance to fire zones CB-FZ-5a and 5b respectively. In addition two open duct penetrations and two louvers are located R6 in the boundary adjacent to these zones. (Ref. ATT.A. SH.55 for penetration details.) However, combustibles in FH-FZ-5 are not concentrated on elevation 380'. Concentrations of class A combustibles are situated on elevation 355'-0" and combustibles in cable tray are situated primarily at elevation 350'. Also, the

east boundary where adjacent to fire area CB-FA-3d has six ventilated (passive) bus ducts (each 6"x8 1/2") which are not internally sealed. These bus duct penetrations are externally sealed at the barrier to a three hour rating and are controlled as such. However, this boundary qualifies as an A2 boundary as CB-FA-3d is provided with an automatic suppression system. The floor is adjacent to zone FH-FZ-2, however, FH-FZ-2 is provided with an automatic wet pipe sprinkler system where adjacent to FH-FZ-5. (Ref. ATT.A. SH.56 for penetration details.) The ceiling is not adjacent to any other plant areas. Combustible loadings on either side of non fire rated zone boundaries are: R6

a. FH-FZ-5 - 93,398 Btu/ft^2 (70 min)
b. FH-FZ-2 - 20,732 Btu/ft^2 (16 min)
c. FH-FZ-4 - 2,149 Btu/ft^2 (2 min)
d. CB-FZ-5a - 15,280 Btu/ft^2 (12 min)
e. CB-FZ-5b - 14,680 Btu/ft^2 (11 min)

The principal combustible in this zone is cable insulation. Unsealed penetrations through the non-rated sheet metal walls where adjacent to fire zone CB-FZ-5a and CB-FZ-5b will be sealed with a non-combustible material. The open duct penetrations and the louvers will be provided with one hour rated fire dampers. This will preclude passage of smoke and hot gases through the unrated walls as the combustibles within this zone are not directly adjacent to the unrated walls. Note that this configuration does R6

not conform to the criteria established for a Category B1 boundary, however the relative location of the combustibles in this zone with respect to the unrated sheet metal wall (vertical separation) is sufficient to insure that flame propagation to elevation 380' is unlikely and that the proposed non-combustible seals in the wall will prevent the spread of smoke and hot gases across the wall. The duct penetration on elevation 380' of the west boundary is not provided with a fire damper.

Again, fire zone FH-FZ-5 fire loading exceeds 40,000 Btu/ft^2. However, the relative location of the combustibles in this fire zone with respect to the duct is sufficient to insure that flame propagation to elevation 380'-0" is unlikely and that the duct will remain intact to prevent the spread of smoke and hot gases across the west boundary. The area between the duct and penetration will be sealed with a non-combustible material to prevent the spread of smoke and hot gases across the boundary. R6

The zone boundaries are primarily of rated or concrete construction presenting a substantial barrier to fire propagation. Additional modifications, as described above, prevent the spread of flame, smoke, and hot gases across the zone boundary. These features in conjunction with automatic suppression in several adjacent zones provides assurance that fires will not propagate beyond the zone bounaries.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

R6

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	*Rated/B1/A2	**B1	A2	A1

* Sheet metal wall (where adjacent to CB-FZ-5a and 5b) will be sealed with non-combustible material; duct and louver penetrations to be provided with one hour fire dampers, unsealed bus ducts with CB-FA-3d provided with automatic suppression, loading on one side greater than 40,000 Btu/ft^2.

**Except 380' elevation - Duct penetration in west boundary to be sealed around outside of penetration; no fire damper in duct; loading on one side greater than 40,000 Btu/ft^2.

18. FH-FZ-6 - Chiller Room - El. 285'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The east boundary is a three-hour rated fire barrier. The north and south boundaries are not adjacent to any other plant areas. The west boundary is adjacent to fire zone FH-FZ-1 which is provided with an automatic wet pipe sprinkler system. The floor is not adjacent to any other plant areas. The ceiling is adjacent to zone FH-FZ-2 which is provided with an automatic wet pipe sprinkler system. (Ref. ATT.A. SH.57 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. FH-FZ-6 - 3,484 Btu/ft^2 (3 min)

b. FH-FZ-2 - 20,732 Btu/ft^2 (16 min)

c. FH-FZ-1 - 38,954 Btu/ft^2 (29 min)

The zone boundaries are of concrete construction providing a substantial barrier to fire propagation. Automatic suppression systems are provided in adjacent zones and the fire load in this zone is insignificant; therefore, fires would be of insufficient duration and intensity to propagate beyond the zone boundaries.

R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
A1	A1	Rated	A2	A1	A2

19. CB-FZ-5a - North H & V Equipment Room - El. 380'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north, south and east boundaries as well as the floor are three-hour rated fire barriers. The ceiling is not adjacent to any other plant area. The west boundary is adjacent to fire zone FH-FZ-5; however, combustibles in fire zone FH-FZ-5

are not concentrated on elevation 380'. Combustibles in cable tray are concentrated primarily at elevation 350' (approximately 30 feet below elevation 380'.) Concentrations of class A combustibles are situated on elevation 355'-0". A major portion of the west boundary consists of reinforced concrete. The remainder consists of an unrated sheet metal wall with an unlabelled door. The west boundary has an open duct penetration and a louver for room ventilation. (Ref. ATT.A. SH.58 for penetration details.) Combustible loadings on either side of the nonfire rated zone boundary are as follows: R6 R6

a. CB-FZ-5a - 15,280 Btu/ft^2 (12 min)

b. FH-FZ-5 - 93,398 Btu/ft^2 (70 min)

R6

The principal combustible in this zone (CB-FZ-5a) is activated charcoal which is contained in the Control Building Emergency Air Filtration unit. The unit is provided with thermal detectors which alarm in the control room and a manually activated deluge water spray system protecting the charcoal. Activation is achieved from a control panel in fire area CB-FA-4b (control room). Cable insulation also exists within this zone.

Unsealed penetrations through the non-rated sheet metal wall will be sealed with a non-combustible material. The open duct penetration and the louver will be provided with one hour fire rated dampers. R6

These modifications will preclude the passage of smoke and hot gases primarily from fire zone FH-FZ-5. The potential for a fire originating within this zone (principally charcoal protected by fixed suppression) spreading outside to fire zone FH-FZ-5 and into fire zone CB-FZ-5b is precluded by modifying the existing penetrations as detailed above. Conversely, modifications to existing penetrations in the unrated sheet metal wall as detailed above are sufficient to preclude the spread of smoke and hot gases from fire zone FH-FZ-5 as the combustible loadings in FH-FZ-5 are not directly adjacent to the sheet metal wall. Note that this configuration does not conform to the criteria established for a Category B1 boundary since the fire loading in fire zone FH-FZ-5 exceeds 40,000 Btu/ft^2, however the relative location of the combustibles in fire zone FH-FZ-5 with respect to the unrated sheet metal wall (vertical separation) is sufficient to insure that flame propagation to elevation 380' is unlikely and that the proposed non-combustible seals in the wall will prevent the spread of smoke and hot gases through the wall and into fire zone CB-FZ-5a. R6

The major portion of the zone boundary is of rated construction and the unrated portion provides a significant barrier to fire propagation. The modifications discussed above will prevent the spread of flame, smoke and hot gases. These features in conjunction with the low fire load in this zone assures that fires will not propagate beyond the zone boundaries.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	Rated	*B1	Rated	A1

*Sheet metal wall penetrations will be sealed with non-combustible material, open duct penetration and louver will be provided with one hour rated fire damper; loading on one side greater than 40,000 Btu/ft^2.

20. CB-FZ-5b - South H & V Equipment Room - El. 380'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north and east boundaries as well as the floor are three-hour fire barriers. The south boundary and ceiling are not adjacent to any other plant area. The west boundary is adjacent to fire zone FH-FZ-5; however, combustibles in fire zone FH-FZ-5 are not concentrated on elevation 380'. Combustibles in cable tray are concentrated primarily at elevation 350' (approximately 30 feet below elevation 380'). Concentrations of Class A combustibles are situated on elevation 355'-0". A major portion of the west boundary consists of reinforced concrete. The remainder consists of an unrated sheet metal wall with an unlabeled door. The west boundary has an open duct penetration and a louver for

room ventilation. (Ref. ATT.A SH.59 for penetration details.) R6
Combustible loadings on either side of the nonfire rated zone boundary are as follows:

a. CB-FZ-5b - 14,680 Btu/ft^2 (11 min)

b. FH-FZ-5 - 93,398 Btu/ft^2 (70 min)

The principal combustible in this zone (CB-FZ-5b) is activated charcoal which is contained in the Control Building Emergency Air Filtration Unit. The unit is provided with thermal detectors which alarm in the control room and a manually actuated deluge water spray system protecting the charcoal. Activation is achieved from a control panel in fire area CB-FA-4b (control room). Cable insulation exists within this zone. R6

Unsealed penetrations through the non-rated sheet metal wall will be sealed with a non-combustible material. The open duct penetration and the louver will be provided with one hour rated fire dampers. These modifications will preclude the passage of smoke and hot gases primarily from fire zone FH-FZ-5. The potential for a fire originating within this zone (principally charcoal protected by fixed suppression) spreading outside to fire zone FH-FZ-5 and into fire zone CB-FZ-5a is precluded by modifying the existing penetrations as detailed above. Conversely, modifications to existing penetrations in the unrated sheet metal wall, as detailed above, are sufficient to preclude the spread of smoke and hot R6

gases from fire zone FH-FZ-5 as the combustible loadings in FH-FZ-5 are not directly adjacent to the sheet metal wall. Note that this configuration does not conform to the criteria established for a Category B1 boundary since the fire loading in fire zone FH-FZ-5 exceeds 40,000 Btu/ft^2; however, the relative location of the combustibles in fire zone FH-FZ-5 with respect to the unrated sheet metal wall (vertical separation) is sufficient to insure that flame propagation to elevation 380'-0" is unlikely and that the proposed non-combustible seals in the wall will prevent the spread of smoke and hot gases through the wall and into fire zone CB-FZ-5b.

The major portion of the zone boundary is of rated construction and the unrated portion provides a significant barrier to fire propagation. The modifications discussed above will prevent the spread of flame, smoke and hot gases. These features in conjunction with the low fire load in this zone assures that fires will not propagate beyond the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classifications in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	A1	Rated	*B1	Rated	A1

*Sheet metal wall penetrations will be sealed with non-combustible material, open duct penetration and louver will be provided with one hour rated fire dampers; however, loading on one side greater than 40,000 Btu/ft^2.

21. AB-FA-1 - Decay Heat Removal Pit A

Area boundaries consist of reinforced concrete walls, floor, and ceiling. The west wall and the floor are not adjacent to any other plant area. A portion of the north wall is not adjacent to any other plant area. The remainder of the north wall is adjacent to the Intermediate Building via the lower tendon access gallery. Openings are provided with rated seals. The south and east walls are three-hour rated barriers. The ceiling is a three-hour rated barrier. Note that the ceiling is provided with two 1/2-inch thick steel personnel access hatches which are not rated, however all other penetrations in this ceiling are controlled and maintained with three-hour rated fire seals. The hatches are monitored daily to assure they are kept closed. The ceiling is adjacent to fire zones AB-FZ-4 and AB-FZ-5. A fire detection system, which alarms in the control room, is provided for fire area AB-FA-1. Combustible loadings on either side of the ceiling which is three-hour fire rated with the exception of the non-rated steel personnel access hatches and on either side of that portion of the north wall adjacent to the Intermediate Building are: R6

a. AB-FA-1 - 3,716 Btu/ft^2 (3 min.)

b. AB-FZ-4 - 52,822 Btu/ft^2 (40 min.)

c. AB-FZ-5 - 20,062 Btu/ft^2 (15 min.)

Note that the unrated personnel hatches are adjacent to fire zone AB-FZ-4 which is currently protected by a manually actuated deluge water spray system. However, this system will be converted to an automatically actuated preaction system. The principal combustible in fire zone AB-FZ-5 over the hatch is cable insulation in tray. The portion of zone AB-FZ-5 over the personnel hatch will be provided with fire detection system which alarms in the control room.

The major portion of this area boundary is of rated construction and penetrations (except steel hatches) in unrated portions are sealed with non-combustible material which provides a substantial barrier to fire propagation. The extremely low fire loading and monitoring of the steel hatch in conjunction with early warning detection assures that fires will not propagate beyond the area boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary ir this zone if presented below:

	Walls				
North	South	East	West	Floor	Ceiling
A1/B1	Rated	Rated	A1	A1	*Rated/A2

*Except for steel personnel access hatch.

22. AB-FA-2 - Decay Heat Removal Pit B

Area boundaries consist of reinforced concrete walls, floor, and ceiling. The south and west walls, a portion of the east wall, and the floor are not adjacent to any other plant area.

The remainder of the east wall and the entire north wall are three hour rated barriers. The ceiling is a three hour rated barrier. R6
Note that the ceiling is provided with two steel personnel access hatches which are not rated, however all other penetrations in this ceiling are controlled and maintained with three-hour fire rated seals. The hatches are monitored daily to assure they are kept closed. The ceiling is adjacent to fire zones AB-FZ-4 and AB-FZ-5. A fire detection system, which alarms in the control room, is provided for fire area AB-FA-2. Combustible loadings on either side of the ceiling which is three-hour fire rated with the exception of the non-rated steel personnel access hatches are:

a. AB-FA-2 - 2,600 Btu/ft^2 (2 min.)
b. AB-FZ-4 - 52,822 Btu/ft^2 (40 min.)
c. AB-FZ-5 - 20,062 Btu/ft^2 (15 min.)

The unrated personnel hatches are adjacent to fire zone AB-FZ-4 which is currently protected by a manually actuated deluge water spray system and a fire detection system which alarms in the control room. However, this system will be converted to an automatically actuated preaction system. The principal combustible in fire zone AB-FZ-4 is cable insulation in tray.

The boundaries of this fire area are either three hour fire rated or of concrete construction with penetrations sealed with non-combustible material except the steel personnel access hatches. These hatches are monitored daily to assure barrier integrity. Since the fire load in this area is insignificant, these features are adequate to assure fires will not propagate beyond the zone boundaries; however, on early warning detection system is provided to assure timely response of the plant fire brigade. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	A1	A1 & Rated	A1	A1	*Rated/A2

*Except for steel personnel access hatches.

The above discussion which describes the features, both passive and active, which are used to delineate the zone boundaries of the Auxiliary and Fuel Handling Building including the Control Building H & V Equipment Rooms and Decay Heat Removal Pits adequately demonstrates the capability for the limiting of fire within the boundaries of each zone. The Appendix R analysis presented in Section 3.0 of the Fire Hazards Analysis Report and Appendix R Section IIIG Safe Shutdown Evaluation is based on the zone boundaries discussed above. Since credible fires will be contained within the established zone boundaries, this analysis provides an equivalent configuration to the Appendix R criteria. R6

II Intermediate Building

The Intermediate Building is classified as one fire area which has been subdivided into 8 zones for the purpose of analysis. Each fire zone is treated independently and analyzed as a fire area due to the construction features of its boundaries and/or existing active fire detection systems installed on either or both sides of the zone boundary. The following is a brief description of the zone boundaries for each zone, the zones' active fire protection features, and the combustible loadings on either side of the nonfire rated zone boundaries. Categorization of the zone boundaries is designated as per the category description discussed in the introduction in a summary at the end of each section. R6

1. IB-FZ-1 - Valve Gallery and Penetration Room - El. 295'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north and west boundaries are adjacent to fire zone IB-FZ-4 on elevation 295' with an open passage between the zones and adjacent to fire zone IB-FZ-5 on elevation 305' with an "A" label door provided between the zones on elevation 305'. (Ref. ATT.A. SHTS.60 and 61 for penetration details.) The south boundary is a three-hour rated barrier. The east boundary is adjacent to fire zone IB-FZ-2. (Ref. ATT.A. SH.62 for penetration details.) A portion of the floor is adjacent to fire zone IB-FZ-8 which contains no combustible material (Ref. ATT.A. SH.63 for penetration details). The remainder of the floor is not adjacent to any other plant area. The ceiling is adjacent to fire zone IB-FZ-6. (Ref. ATT.A. SH.64 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. IB-FZ-2 - 10,199 Btu/ft^2 (8 min)

b. IB-FZ-1 - 8,925 Btu/ft^2 (7 min)

c. IB-FZ-4 - 9 Btu/ft^2 (0 min)

d. IB-FZ-5 - 549 Btu/ft^2 (1 min)

e. IB-FZ-6 - 4,487 Btu/ft^2 (4 min)

f. IB-FZ-8 - 0 Btu/ft^2 (0 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to

transient combustibles, exposed cable in tray penetrations sealed with kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seal is not fire rated. Where cable tray penetrations are not sealed, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire. Although there are unsealed penetrations through the zone boundaries, fire loading in this zone, as well as all adjacent zones, is well below 30 minutes.

Safe shutdown equipment in this area consists of valves and their associated cabling. Sufficient time exists for manual valve operation; therefore, electrical cables are not relied upon for valve operation as discussed in Section 3.3.1.

R6

The boundaries of this fire zone are of concrete construction which provides a substantial barrier to fire propagation. Although there are unsealed penetrations through the zone boundaries, the fire load within this zone, as well as all adjacent zones, is well below 30 minutes (maximum 8 minutes); therefore fires would be of insufficient duration and intensity to propagate beyond the zone boundaries. Furthermore, this zone is provided with an early warning detection system to assure rapid response of the plant fire brigade.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
B2	Rated	B2	B2	B2*/A1	B2

*No combustible material below floor.

R6

2. IB-FZ-2 - Turbine Driven EFW Pump Room - El. 295'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north boundary is adjacent to fire zone IB-FZ-4 on elevation 295' with an open passage between the zones, and adjacent to fire zone IB-FZ-5 on elevation 305' with an "A" label door provided between the zones on elevation 305'-0". (Ref. ATT.A. SH.65 for penetration details.) The south boundary is a three-hour rated fire barrier. The east boundary is adjacent to fire zone IB-FZ-3. (Ref. ATT.A. SH.66 for penetration details.) The west boundary is adjacent to fire zone IB-FZ-1. (Ref. ATT.A.

SH.67 for penetration details.) A portion of the floor is adjacent to fire zone IB-FZ-8, which contains no combustible material; and the remainder of the floor is not adjacent to any other plant area. (Ref. ATT.A. SH.68 for penetration details.) The ceiling is adjacent to fire zone IB-FZ-6. (Ref. ATT.A. SH.69 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. IB-FZ-2 - 10,199 Btu/ft^2 (8 min)
b. IF-FZ-1 - 8,925 Btu/ft^2 (7 min)
c. IB-FZ-3 - 5,659 Btu/ft^2 (5 min)
d. IB-FZ-4 - 9 Btu/ft^2 (0 min)
e. IB-FZ-5 - 549 Btu/ft^2 (1 min)
f. IB-FZ-6 - 4,487 Btu/ft^2 (4 min)
g. IB-FZ-8 - 0 Btu/ft^2 (0 min)

The principal combustibles in this zone are cable insulation and lube oil. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seal is not fire rated. Where cable tray penetrations are not sealed, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire.

Safe shutdown equipment in this zone consists of valves, their associated cabling, and the turbine driven Emergency Feedwater Pump (see Section 2.3.2). Safe shutdown valves are associated with the emergency feedwater pump for which redundant emergency feedwater capability exists in Fire Zone IB-FZ-3. The area between the emergency feedwater pumps is separated by two intervening concrete walls and a distance of more than 40 feet. Although there are unsealed openings in the intervening walls, there is no line of sight between redundant pumps. Combustible loadings within this zone and in all adjacent zones are much less than 30-minutes duration. The only other combustible besides cable insulation is approximately 5 gallons of lube oil contained in the emergency feedwater pump. Spacial separation with intervening walls and low fire loadings provide assurance that a single fire will not propagate beyond the zone boundary. In addition, an early warning fire detection system is provided which assures rapid response of the plant fire brigade. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
B2	Rated	B3	B2	B2*/A1	B2

* No combustible material below floor.

3. IB-FZ-3 - Motor Driven EFW Pump Room - El. 295'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north boundary is adjacent to fire zone IB-FZ-4 on elevation 295' with two open passages between the zones, and adjacent to fire zone IB-FZ-5 on elevation 305' with three "A" labelled doors provided between the zones on elevation 305'-0". (Ref. ATT.A. SH.70 and 71 for penetration details.) The south and east boundaries are three-hour rated fire barriers. The west boundary is adjacent to fire zone IB-FZ-2. (Ref. ATT.A. SH.72 for penetration details.) A portion of the floor is adjacent to fire zone IB-FZ-8 which contains no combustible material; the remainder of the floor is not adjacent to any other plant area. (Ref. ATT.A. SH.73 for penetration details.) The ceiling is adjacent to fire zone IB-FZ-6. (Ref. ATT.A. SH.74, 75 and 76 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. IB-FZ-3 - 5,659 Btu/ft^2 (5 min)

b. IB-FZ-2 - 10,199 Btu/ft^2 (8 min)

c. IB-FZ-4 - 9 Btu/ft^2 (0 min)

d. IB-FZ-5 - 549 Btu/ft^2 (1 min)

e. Ib-FZ-6 - 4,487 Btu/ft^2 (4 min)

f. IB-FZ-8 - 0 Btu/ft^2 (0 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to

transient combustibles, exposed cable in tray penetrations sealed with kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seal is not fire rated. Where cable tray penetrations are not sealed, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire.

Safe shutdown equipment in this zone consists if valves, their associated cabling, and the motor driven emergency feedwater pumps (see Section 3.3.3). The motor driven emergency feedwater pumps are redundant to the turbine driven emergency feedwater pump in zone IB-FZ-2. The area between the turbine driven and motor driven emergency feedwater pumps is separated by two intervening concrete walls and a distance of more than 40 feet. Although there are unsealed openings in the intervening walls, there is no line of sight between redundant pumps. Combustible loadings within this zone and all adjacent zones are much less than 30-minutes duration. The only other combustible besides cable insulation is 7 gallons of lube oil in the motor driven emergency feedwater pumps. Spatial separation and the low fire loadings provide assurance that a single fire will not propagate beyond the zone boundary. In addition, an early warning fire detection system is provided which assures rapid response of the plant fire brigade. R6

The above discussion provides the basis for establishing the boundary classifications in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

R6

Walls				Floor	Ceiling
North	South	East	West		
B2	Rated	Rated	B3	B2*/A1	B2

*No combustible material below floor.

4. IB-FZ-4 - Remainder of El. 295'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The west boundary is not adjacent to any other plant area. A portion of the north boundary is adjacent to the Diesel Generator Building which is a three-hour rated fire barrier. The remainder of the north boundary is not adjacent to any other plant areas. The east boundary adjacent to the Turbine Building and the south boundary adjacent to the Reactor Building are three-hour rated fire barriers. The remaining east boundary is adjacent to fire zone IB-FZ-1. (Ref. ATT.A. SH.77 for penetration details.) The remaining south boundary is adjacent to fire zones IB-FZ-1, IB-FZ-2, and IB-FZ-3 with open passages to each zone. (Ref. ATT.A. SHTS.60, 65 and 70 for penetration details.) A portion of the floor is adjacent to fire zone IB-FZ-8 which contains no combustible material; the remainder of the floor is not adjacent to

R6

any plant area. (Ref. ATT.A. SH.78 for penetration details.) The ceiling is adjacent to fire zone IB-FZ-5. (Ref. ATT.A. SH.79 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. IB-FZ-4 - 9 Btu/ft^2 (0 min)

b. IB-FZ-1 - 8,925 Btu/ft^2 (7 min)

c. IB-FZ-2 - 10,199 Btu/ft^2 (8 min)

d. IB-FZ-3 - 5,659 Btu/ft^2 (5 min)

e. IB-FZ-5 - 549 Btu/ft^2 (1 min)

f. IB-FZ-8 - 0 Btu/ft^2 (0 min)

The principal combustible in this zone is cable insulation which is negligible. Should ignition of cable occur either electrically or due to transient combustibles, it is reasonable to assume that the fire brigade can reach the zone prior to a cable fire propagating outside the zone due to the slow burning nature of a cable fire. Combustible loadings within this zone and all adjacent zones are much less than 30-minutes duration. A fire occurring in this zone along the south boundary which is adjacent to fire zones IB-FZ-1, 2 & 3 will not impact both motor driven emergency feedwater pumps and turbine driven emergency feedwater pumps and their associated valves due to the spatial separation between the pumps. Any valves in the adjacent zones IB-FZ-1, 2 or 3 which may be impacted by a fire in this zone can be operated manually as detailed in Section 3.3.1. R6

The boundaries of this fire zone are of concrete construction which provides a substantial barrier to fire propagation. Although these are unsealed penetrations through the zone boundaries, the fire load within this zone, as well as all adjacent zones, is well below 30 minutes (maximum 8 minutes); therefore, fires would be of insufficient duration and intensity to propagate beyond the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

	Walls				Floor	Ceiling
	North	South	East	West		
Rated	*A1	*B2	*B2	A1	B2*/A1	B2

*Portions adjacent to the Turbine and Reactor building are rated.

5. IB-FZ-5 - Corridor - El. 305'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north boundary adjacent to the Diesel Generator Building and Service Building is a three-hour fire rated barrier. The east boundary adjacent to the Turbine Building and the south boundary adjacent to the Reactor Building are three-hour rated barriers. The remaining east boundary is adjacent to fire zone

IB-FZ-1. (Ref. ATT.A. SH.80 for penetration details.) The remaining south boundary is adjacent to fire zones IB-FZ-1, IB-FZ-2, and IB-FZ-3 with "A" labelled doors provided between zone IB-FZ-4 and those zones on Elevation 305'. (Ref. ATT.A. SHS.60, 65 and 70 for penetration details.) The west boundary is not adjacent to any other plant areas. The floor is adjacent to fire zone IB-FZ-4. (Ref. ATT.A. SH.81 for penetration details.) The ceiling is adjacent to fire zone IB-FZ-6. (Ref. ATT.A. SH.82 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. IB-FZ-5 - 549 Btu/ft^2 (1 min)
b. IB-FZ-1 - 8,925 Btu/ft^2 (7 min)
c. IB-FZ-2 - 10,199 Btu/ft^2 (8 min)
d. IB-FZ-3 - 5,659 Btu/ft^2 (5 min)
e. IB-FZ-4 - 9 Btu/ft^2 (0 min)
f. IB-FZ-6 - 4,487 Btu/ft^2 (4 min)

The combustibles in this zone are negligible. It is reasonable to assume that the fire brigade can reach the zone prior to cable fire propagating through an unsealed penetration due to the slow burning nature of a cable fire. Combustible loadings within this zone and all adjacent zones are much less than 30-minutes duration. A fire occurring in this zone along the south boundary which is adjacent fire zones IB-FZ1, 2 and 3 will not impact both R6

motor driven emergency feedwater pumps and turbine driven emergency feedwater pumps and their associated valves due to the spatial separation between the pumps. Any valves in the adjacent zones IB-FZ-1, 2 and 3 which may be impacted by a fire in this zone can be manually operated as detailed in Section 3.3.1.

The boundaries of this fire zone are of concrete construction which provides a substantial barrier to fire propagation. Although these are unsealed penetrations through the zone boundaries, the fire load within this zone, as well as all adjacent zones is well below 30 minutes (maximum 8 minutes); therefore, fires would be of insufficient duration and intensity to propagate beyond the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	B2	Rated/B2	A1	B2	B2

6. IB-FZ-6 - El. 322'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north, south, and east boundaries are three-hour

rated fire barriers. The west boundary is not adjacent to any other plant area. The floor is adjacent to fire zones IB-FZ-1, IB-FZ-2, IB-FZ-3, and IB-FZ-5. (Ref. ATT.A. SH.83 for penetration details.) The ceiling is adjacent to fire zone IB-FZ-7. (Ref. ATT.A. SH.84 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. IB-FZ-6 - 4,487 Btu/ft^2 (4 min)

b. IB-FZ-1 - 8,925 Btu/ft^2 (7 min)

c. IB-FZ-2 - 10,199 Btu/ft^2 (8 min)

d. IB-FZ-3 - 5,659 Btu/ft^2 (5 min)

e. IB-FZ-5 - 549 Btu/ft^2 (1 min)

f. IB-FZ-7 - 2,650 Btu/ft^2 (2 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with maronite and kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seals are not fire rated. Combustible loadings within this zone and all adjacent zones are much less than 30-minutes duration. There is no safe shutdown equipment in cables in this fire zone. A fire occurring in this zone which is located above fire zones IB-FZ-1, 2, 3 and 5 will not impact both motor driven emergency feedwater pumps and turbine driven feedwater pump and their associated valves due to the spatial separation between the pumps. Any

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P6

valves in the adjacent zones IB-FZ-1, 2 and 3 which may be impacted by a fire in this zone can be manually operated as detailed in Section 3.3.1.

The boundaries of this fire zone are of concrete construction which provides a substantial barrier to fire propagation. Although these are unsealed penetrations through the zone boundaries, the fire load within this zone, as well as all adjacent zones, is well below 30 minutes (maximum 8 minutes); therefore, fires would be of insufficient duration and intensity to propagate beyond the zone boundaries.

R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated/A1	Rated	Rated	A1	B2	B2

7. IB-FZ-7 - El. 355'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The south and east boundaries are three-hour rated fire barriers. The north and west boundaries and the ceiling are not

adjacent to any other plant area. The floor is adjacent to fire zone IB-FZ-6. (Ref. ATT.A. SH.85, 86 and 87 for penetration details.) Combustible loadings on either side of each nonfire rated zone boundary are as follows:

a. IB-FZ-7 - 2,650 Btu/ft^2 (2 min)

b. IF-BZ-6 - 4,487 Btu/ft^2 (4 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with maronite and kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seals are not fire rated. It is reasonable to assume that the fire brigade can reach the zone prior to a fire propagating through an unsealed penetration. Combustible loadings within this zone and all adjacent zones are much less than 30-minutes duration. There is no safe shutdown equipment or cables in this fire zone.

The boundaries of this fire zone are of concrete construction which provides a substantial barrier to fire propagation. Although these are unsealed penetrations through the zone boundaries, the fire load within this zone, as well as all adjacent zones, is well below 30 minutes (maximum 8 minutes); therefore, fires would be of insufficient duration and intensity to propagate beyond the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
A1	Rated	Rated	A1	B2	A1

R6

8. IB-FZ-8 - Alligator-Pit - El. 279' - 0"

Zone boundaries consist of reinforced concrete walls, floor and ceiling. Walls adjacent to the Reactor Building, Fuel Handling Building, Auxiliary Building and ceiling adjacent to the Turbine Building are three-hour rated fire barriers. The floor is not adjacent to any other plant area. The remainder of the ceiling is adjacent to fire zones IB-FZ-1, IB-FZ-2, IB-FZ-3 and IB-FZ-4. (Ref. ATT.A. SH.88 for penetration details.) The area on the opposite side of this boundary is not analyzed as it is essentially empty. Combustible loadings on either side of each nonfire rated zone boundary are as follows:

R6

a. IB-FZ-8 - 0 Btu/ft^2 (0 min)

b. IB-FZ-1 - 8,925 Btu/ft^2 (7 min)

c. IB-FZ-2 - 10,199 Btu/ft^2 (8 min)

d. IB-FZ-3 - 5,659 Btu/ft^2 (5 min)

e. IB-FZ-4 - 9 Btu/ft^2 (0 min)

The combustibles in this zone are negligible. Note that significant quantities of grease are contained within stressing cover plates associated with the Reactor Building tendons are located in this zone. However, this is not considered to be a fire loading because the grease is contained and no combustibles are located adjacent to the tendons which would expose them. There is no safe shutdown equipment or cables in this zone.

The boundaries of this fire zone are of concrete construction which provides a substantial barrier to fire propagation. Although these are unsealed penetrations through the zone boundaries, the fire load within this zone, as well as adjacent zones, is well below 30 minutes (maximum 8 minutes); therefore, fires would be of insufficient duration and intensity to propagate beyond the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
A1*	Rated	Rated	Rated	A1	B2

The above discussion which describes the features which are used to delineate the zone boundaries of the Intermediate Building adequately demonstrates the capability for the limiting of fire within the boundaries of each zone. The Appendix R analysis presented in Section 3.0 of the Fire Hazards Analysis Report and Appendix R Section IIIG Safe Shutdown Evaluation is based on the zone boundaries discussed above. Since credible fires will be contained within the established zone boundaries, this analysis provides an equivalent configuration to the Appendix R criteria.

III Intake Screen and Pump House

The Intake Screen and Pump House excluding the Diesel Fire Pump Room, is classified as one fire area which has been subdivided into three zones for the purpose of analysis. Each fire zone is treated independently and analyzed as a fire area due to the construction features of its boundaries and/or existing active fire detection and suppression systems installed on either or both sides of the zone boundary. The following is a brief description of the zone boundaries for each zone, the zone's active fire protection features, and the combustible loadings on either side of the nonfire rated zone boundaries.

1. ISPH-FZ-1 - 1R SWGR Area - El. 308'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north boundary is a three-hour rated fire barrier

with the exception of ventilated (passive) bus duct internals penetrating the barrier, however all other penetrations in this wall are controlled and maintained with three hour rated fire seals. The east and south boundaries and the ceiling are not adjacent to any other plant areas. The floor is adjacent to the intake pit, which has no combustible loading and is not analyzed. (Ref. ATT.A. SH.89 and 90 for penetration details.) The west boundary is adjacent to fire zone ISPH-FZ-3. Doorways are provided with "A" labelled doors. (Ref. ATT.A. SH.91 for penetration details.) An automatic wet pipe suppression system is provided on both sides of the north and west boundaries and a fire detection system which alarms in the control room is provided for this zone and zone ISPH-FZ-2. Combustible loadings on either side of the north and west boundaries of this zone are as follows:

R6

R6

a. ISPH-FZ-1 - 15,854 Btu/ft^2 (12 min)

b. ISPH-FZ-2 - 16,020 Btu/ft^2 (12 min)

c. ISPH-FZ-3 - 344 Btu/ft^2 (1 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with grout will preclude a slow burning cable fire from propagating through the west zone boundary, although the seals are not fire rated. In addition, the automatic fire suppression system on both sides of the north and west boundaries will prevent the propagation of fire across either boundary.

R6

All boundaries enclosing this zone are of reinforced concrete construction which provides a substantial barrier to fire propagation. The fire loading in this zone, as well as all adjacent zones, is minimal and an automatic suppression system is provided on both sides of the boundaries between adjacent zones (except the floor). These features in conjunction with the early warning detection system assure fires will not propagate across the zone boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this action. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
*A3	A1	A1	A3	A1	A1

*Also rated except for ventilated bus duct internals.

2. ISPH-FZ-2 - 1T SWGR Area - El. 308'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north boundary is a three-hour fire rated barrier where adjacent to ISPH-FA-2; the remainder is not adjacent to any other plant area. The south boundary is a three-hour rated fire barrier with the exception of the ventilated (passive) bus duct

internals penetrating barrier; however, all other penetrations in this wall are controlled and maintained with three-hour fire rated seals. The east boundary and the ceiling are not adjacent to any other plant areas. The floor is adjacent to the intake pit, which has no combustible loading and is not analyzed. (Ref. ATT.A. SH.92 and 93 for penetration details.) The west boundary is adjacent to fire zone ISPH-FZ-3 with two open passageways. (Ref. ATT.A. SH.94 and 95 for penetration details.) An automatic wet pipe suppression system is provided on both sides of the south and west boundaries and a fire detection system which alarms in the control room is installed in this zone and zone ISPH-FZ-1. R6

Combustible loadings on either side of the south and west boundaries are as follows:

a. ISPH-FZ-1 - 15,854 Btu/ft^2 (12 min)

b. ISPH-FZ-2 - 16,020 Btu/ft^2 (12 min)

c. ISPH-FZ-3 - 344 Btu/ft^2 (1 min)

The principal combustible in this zone is cable insulation. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with kaowool will preclude a slow burning cable fire from propagating through the west zone boundary, although the seals are not fire rated. In addition, the automatic fire suppression system on both sides of the south and west boundaries will prevent the spread of fire across either boundary. R6

All boundaries enclosing this zone are of reinforced concrete construction which provides a substantial barrier to fire propagation. The fire loading in this zone, as well as all adjacent zones, is minimal and an automatic suppression system is provided on both sides of the boundaries between adjacent zones (except the floor). These features in conjunction with the early warning detection system assure fires will not propagate across the zone boundaries.

R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls					
North	South	East	West	Floor	Ceiling
Rated/A1	*A3	A1	A3	A1	A1

*Also rated except for ventilated bus duct internals.

3. ISPH-FZ-3 - Trash Rake and Screen Area - El. 308'

Zone boundaries consist of reinforced concrete walls, floor and ceiling. The north boundary is a three-hour rated fire barrier where adjacent to ISPH-FA-2; the remainder is not adjacent to any other plant area. The south and west boundaries and the ceiling are not adjacent to any other plant area. The floor is adjacent

to the intake pit, which has no combustible loading and is not analyzed. The east boundary is adjacent to fire zones ISPH-FZ-1 and ISPH-FZ-2 with "A" labelled doors provided where adjacent to fire zone ISPH-FZ-1. (Ref. ATT.A. SH.96 for penetration details.) An automatic wet pipe suppression system is provided on both sides of the east boundary and a fire detection system which alarms in the Control Room is provided in adjacent zones ISPH-FZ-1 and ISPH-FZ-2. Combustible loadings on either side of the non-rated east boundary are as follows: R6

a. ISPH-FZ-3 - 344 Btu/ft^2 (1 min)

b. ISPH-FZ-1 - 15,854 Btu/ft^2 (12 min)

c. ISPH-FZ-2 - 16,020 Btu/ft^2 (12 min)

The combustibles in this zone are negligible. Should ignition of cable occur either electrically or due to transient combustibles, exposed cable in tray penetrations sealed with kaowool will preclude a slow burning cable fire from propagating through the zone boundary, although the seal is not fire rated. In addition, the automatic fire suppression system on both sides of the east boundary will prevent the spread of fire across the boundary. R6

All boundaries enclosing this zone are of reinforced concrete construction which provides a substantial barrier to fire propagation. The fire load in this zone is negligible; therefore, a fire in this zone would be of insufficient duration and intensity to propagate beyond the zone boundaries. Additionally, an automatic

suppression system is provided on both sides of the boundary between adjacent zones which further assures boundary integrity. These features provide assurance that a fire will not propagate beyond the zone boundaries.

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this action. The classification of each boundary in this zone is presented below:

R6

	Walls				Floor	Ceiling
	North	South	East	West		
Rated	A1	A1	A3	A1	A1	A1

The above discussion which describes the features both passive and active to delineate the zone boundaries of the Intake Screen and Pump House adequately demonstrates the capability for the limiting of fire within the boundaries of each zone. The Appendix R analysis presented in Section 3.0 of the Fire Hazards Analysis Report and Appendix R Section IIIG Safe Shutdown Evaluation is based on the zone boundaries discussed above. Since credible fires will be contained within the established zone boundaries, this analysis provides an equivalent configuration to the Appendix R criteria.

IV Control Building

Five separate areas within the Control Building are addressed here (CB-FA-2a, CB-FA-2b, CB-FA-3a, CB-FA-3b and CB-FA-3d) for the purpose of identifying penetrating features (passive ventilated bus ducts) through certain area boundaries which are of three hour rated construction with the exception of the ventilated bus duct internals.

1. CB-FA-2a - Control Building 1P Switchgear Room - El. 322'

Area boundaries consist of reinforced concrete walls with floor and ceiling consisting of poured concrete on Q-Decking with steel fireproofing on the underside of the Q-Decking and metal panel walls of sandwich construction (gypsum) all fire rated at three hours. The north and east boundaries are adjacent to the Turbine Building (TB-FA-1), the south boundary is adjacent to fire area CB-FA-2d, the west boundary is adjacent to fire area CB-FA-2b, the floor is adjacent to fire area CB-FA-1 and the ceiling is adjacent to fire area CB-FA-3a. All penetrations through these fire barriers are controlled and maintained with three hour rated fire seals with the exception of one ventilated (passive) 480V bus duct penetration through the west wall. The bus duct is sealed around the outside periphery of the bus duct to a three-hour rating. The bus duct internals are sealed with a 1/2-inch thick fiberglass

R6

seal/fire stop. While not specifically rated at three hours, this configuration will prevent the passage of smoke and hot gases from one side of the barrier to the other through the ventilation openings in the duct. Ionization detection capability is provided on both sides of the west boundary. Combustible loadings on either side of the west boundary are:

a. CB-FA-2a - 81,871 Btu/ft^2 (61 min)
b. CB-FA-2b - 50,939 Btu/ft^2 (38 min)

The principal combustible in this zone is cable insulation. While the configuration of the west boundary does not meet the criteria for acceptability of a zone boundary as established at the beginning of this section, compensating features such as the fiberglass seal/fire stop sealing the bus duct internals will prevent the passage of smoke and hot gases across the boundary through the ventilation openings, maintenance of the seal to a three-hour rating around the periphery of the bus duct at the penetration and all other penetrations through the west boundary as well as early warning fire detection on both sides of the boundary provide assurance that a fire will not propagate across the west boundary. R6

The above discussion provides the basis for establishing the

boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	Rated	*Rated	Rated	Rated

*Rated with the exception of ventilated bus duct internals; combustible loading on both sides of boundary greater than 40,000 Btu/ft^2.

2. CB-FA-2b - Control Building 1S Switchgear Room - El. 322' R6

Area boundaries consist of reinforced concrete walls with floor and ceiling consisting of poured concrete on Q-Decking with steel fireproofing on the underside of the Q-Decking and metal panel walls of sandwich construction (gypsum) all fire rated at three hours. The north boundary is adjacent to the Turbine Building (TB-FA-1) and the Control Building stairtower; the south boundary is adjacent to fire areas CB-FA-2d and CB-FA-2e; the west boundary is adjacent to fire area CB-FA-2c; the east boundary is adjacent to fire area CB-FA-2a; the floor is adjacent to CB-FA-1 and the ceiling is adjacent to fire area CB-FA-3b. All penetrations through these fire barriers are controlled and maintained with three-hour rated fire seals with the exception of a ventilated (passive) 4160V bus duct penetration through the east wall. The bus duct is sealed around the periphery of the bus duct to a

three-hour rating. The internals are sealed with a 1/2-inch thick fiberglass seal/fire stop. While not specifically rated at three hours, this configuration will prevent the passage of smoke and hot gases from one side of the barrier to the other through the ventilation openings in the duct. Ionization detection capability is provided on both sides of the east boundary. Combustible loadings on either side of the east boundary are:

a. CB-FA-2a - 81,871 Btu/ft^2 (61 min)
b. CB-FA-2b - 50,939 Btu/ft^2 (38 min)

The principal combustible in this zone is cable insulation. While the configuration of the east boundary does not meet the criteria for acceptability of a zone boundary as established at the beginning of this section, compensating features such as the fiberglass seal/fire stop sealing the bus duct internals will prevent the passage of smoke and hot gases across the boundary through the ventilation openings. Maintenance of the seal to a three hour rating around the periphery of the bus duct at the penetration and all other penetrations through the east boundary as well as early warning fire detection on both sides of the boundary provide assurance that a fire will not propagate across the east boundary. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described

in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	*Rated	Rated	Rated	Rated

*Rated with the exception of ventilated bus duct internals; combustible loading on both sides of boundary greater than 40,000 Btu/ft^2.

3. CB-FA-3a - Control Building 4160V Switchgear 1D Area - El. 338'

Area boundaries consist of reinforced concrete walls with floor and ceiling consisting of poured concrete on Q-Decking with steel fireproofing and metal panel walls of sandwich construction (gpysum) all fire rated at three hours. The north and east boundaries are adjacent to the Turbine Building (TB-FA-1), the south boundary is adjacent to fire area CB-FA-3d, the west boundary is adjacent to fire area CB-FA-3b and the ceiling is adjacent to CB-FA-4a. All penetrations through these fire barriers are controlled and maintained with three-hour rated fire seals with the exception of three ventilated (passive) 4160V bus duct penetrations through the east and west walls. The bus ducts are sealed around the outside periphery of the bus duct to a three-hour rating. The bus duct internals are sealed with a 1/2-inch thick fiberglass seal/fire stop. While not specifically rated at three hours, this configuration will prevent the passage of smoke and

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hot gases from one side of the barrier to the other through the ventilation openings in the duct. The east wall adjacent to the Turbine Building is provided with an automatic wet pipe sprinkler system in the Turbine Building. Ionization detection capability is provided on both sides of the west boundary. Combustible loadings on either side of the west boundary are:

a. CB-FA-3a - 65,382 Btu/ft^2 (49 min)
b. CB-FA-3b - 66,668 Btu/ft^2 (50 min)

The principal combustible in this zone is cable insulation. The configuration of the east boundary meets the criteria established for a category A2 boundary. While the configuration of the west boundary does not meet the criteria for acceptability of a zone boundary as established at the beginning of this section, compensating features such as the fiberglass seal/fire stop sealing the bus duct internals will prevent the passage of smoke and hot gases across the boundary through the ventilation openings, maintenance of the seal to a three-hour rating around the periphery of the bus duct at the penetration and all other penetrations through the west boundary as well as early warning fire detection on both sides of the boundary provide assurance that a fire will not propagate across the west boundary. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	*A2	**Rated	Rated	Rated

* Rated with the exception of ventilated bus duct internals.

**Rated with the exception of ventilated bus duct internals; combustible loading on both sides of boundary greater than 40,000 Btu/ft^2.

R6

4. CB-FA-3b - Control Building 4160V Switchgear 1E Area - El. 338'

Area boundaries consist of reinforced concrete walls with floor and ceiling consisting of poured concrete on Q-Decking with steel fireproofing on the underside of the Q-Decking and metal panel walls of sandwich construction (gypsum) all fire rated at three hours. The north boundary is adjacent to the Turbine Building (TB-FA-1) and the Control Building stairtower; the south boundary is adjacent to fire area CB-FA-3d, the west boundary is adjacent to fire area CB-FA-3c, the east boundary is adjacent to fire area CB-FA-3a, the floor is adjacent to fire area CB-FA-2b and the ceiling is adjacent to fire area CB-FA-4a. All penetrations through these fire barriers are controlled and maintained with

three-hour rated fire seals with the exception of three ventilated 4160V bus duct penetrations through the east wall. The bus ducts are sealed around the periphery of the bus ducts to a three-hour rating. The internals are sealed with a 1/2-inch thick fiberglass seal/fire stop. While not specifically rated at three hours, this configuration will prevent the passage of smoke and hot gases from one side of the barrier to the other through the ventilation openings in the duct. Ionization detection capability is provided on both sides of the east boundary. Combustible loadings on either side of the east boundary are:

a. CB-FA-3a - 65,382 Btu/ft^2 (49 min)
b. CB-FA-3b - 66,668 Btu/ft^2 (50 min) R6

The principal combustible in this zone is cable insulation. While the configuration of the east boundary does not meet the criteria for acceptability of a zone boundary as established at the beginning of this section, compensating features such as the fiberglass seal/fire stop sealing the bus duct internals will prevent the passage of smoke and hot gases across the boundary through the ventilation openings, maintenance of the seal to a three-hour rating around the periphery of the bus duct at the penetration and all other penetrations through the east boundary as well as early warning fire detection on both sides of the boundary provide assurance that a fire will not propagate across the east boundary.

The above discussion provides the basis for establisning the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	*Rated	Rated	Rated	Rated

* Rated with the exception of ventilated bus duct internals; combustible loading on both sides of boundary greater than 40,000 Btu/ft^2.

5. CB-FA-3d - Control Building Relay Room Area - El. 338'

Area bounaries consist of reinforced concrete walls with floor and ceiling consisting of poured concrete on Q-Decking with steel fireproofing. The east boundary is adjacent to the Turbine Building (TB-FA-1), the south boundary is not adjacent to any other plant area, the north boundary is adjacent to fire areas CB-FA-3a, 3b and 3c, the floor is adjacent to fire areas CB-FA-2d, 2e, 2f and 2g and the ceiling is adjacent to CB-FA-4b. All penetrations through these fire barriers are controlled and maintained with three hour rated fire seals with the exception of six(6"x8 1/2" each) ventilated (passive) bus duct penetrations through the west wall which are not internally sealed. The bus ducts are externally sealed around the outside periphery of the bus duct to R6

a three-hour rating and are controlled as such. Fire area CB-FA-3d is provided with an automatic suppression system actuated by an early warning ionization detection system. Combustible loadings on either side of the west boundary are:

a. CB-FA-3d - 202-44 and Btu/ft^2 (2.53 hrs.)
b. FH-FZ-5 - 93,398 and Btu/ft^2 (70 min.)

All boundaries enclosing this area are three hour fire rated with the exception of the ventilated bus duct penetrations. Early warning fire detection and an automatic fire suppression system provide suppression capability during the early stages of a fire and rapid response by the plant fire brigade. These features and the relatively small penetration area provide assurrance that a fire will not propagate beyond the area boundaries. R6

The above discussion provides the basis for establishing the boundary classification in accordance with the criteria described in the introduction to this section. The classification of each boundary in this zone is presented below:

Walls				Floor	Ceiling
North	South	East	West		
Rated	Rated	Rated	*A2	Rated	Rated

* Rated with the exception of ventilated bus duct internals.

The above discussion which describes the features both passive and active to delineate unrated portions of fire area boundaries in the Control Building adequately demonstrates the capability for the limiting of fire within the boundaries of each of the fire areas addressed. The Appendix R analysis presented in Section 3.0 of the Fire Hazards Analysis Report and Appendix R Section IIIG Safe Shutdown Evaluation is based on the zone boundaries discussed above. Since credible fire will be contained within the established zone boundaries, this analysis provides an equivalent configuration to the Appendix R criteria. R6

V Reactor Building

As with areas outside the Reactor Building, the updated fire hazards analysis for the TMI-1 Reactor Building, which was submitted with the Appendix R Section III G Safe Shutdown Evaluation, utilized an identical delineation of fire zones as had initially been previously utilized under license Amendment 44 in analyzing the effects a fire would have on the plant's capability to safely shutdown. The delineation of fire zones, however, was not established considering the location of all safety related components with respect to each other. For the purposes of analysis, the Reactor Building, which is one fire area, was subdivided into fire zones taking into consideration the combustible loading in localized areas of the building. It is not possible to subdivide

this building solely on the basis of physical boundaries combined with fixed fire suppression system prevalent in other fire zones in the plant as discussed in the justification for areas other than the Reactor Building.

Nevertheless, we maintain that the current delineation of fire zones is based upon sound technical judgment and is legitimate. It should be noted, however, that in identifying Appendix R Section III G noncompliances, the entire Reactor Building was considered one fire area. As a result, the legitimization of fire zones for the purposes of evaluating Appendix R noncompliances is not necessary. Any future modifications inside the Reactor Building will take this into consideration. However, as stated previously, we prefer to leave the current delineation of fire zones as is since they do represent points of reference for localized combustible loadings in the building. For the purpose of requesting specific exemptions from Appendix R Section IIIG the current delineation of fire zones is also important since Section 1.2.1a of this report has requested an exemption from a requirement to install radiant energy heat shields between Reactor Building Emergency Cooling Units AH-E-1A, 1B and 1C in fire zone RB-FZ-1a. Considering the combustible loadings in each fire zone adjacent to fire zone RB-FZ-1a, we maintain that the exemption request based upon evaluating RB-FZ-1a by itself in this instance is valid.

1. Zones RB-FZ-1a, RB-FZ-1b and RB-FZ-1c - Elevation 281'
2. Zones RB-FZ-1d and FB-FZ-1e - D-Rings

3. Zone RB-FZ-2 - Elevation 308'

4. Zone RB-FZ-3 - Elevation 346'

To conclude, the Reactor Building was treated as one fire area for the purpose of evaluating Appendix R noncompliances. Noncompliances were not identified by evaluating each individual fire zone by itself with the exception of the Reactor Building Emergency Cooling units in Zone RB-FZ-1a. Note that modifications to eliminate Appendix R, Section IIIG noncompliances will remain listed on a zone by zone basis and the Fire Hazards Analysis will remain as is using the current delineation of fire zones. We therefore maintain that the safety evaluation conducted for the Reactor Building which identifies noncompliance with Section IIIG of Appendix R to 10CFR50 considering the Reactor Building as one fire area is acceptable.

Enclosure B

1.2.9 Air Intake Tunnel

Fire Area AIT-FA-1.

No Appendix R Section IIIG non-compliances. No exemption request is required.

1.2.10 Additional Modifications to Upgrade Zone Boundaries

a. Fire Zone AB-FZ-1

No modifications required.

b. Fire Zone AB-FZ-2a

Replace existing door with door equipped with damper held open by fusible link. (west boundary)

R6

c. Fire Zone AB-FZ-2b

Replace existing door with door equipped with damper held open by fusible link (west boundary)

d. Fire Zone AB-FZ-2c

Replace existing door with door equipped with damper held open by fusible link (west boundary)

e. Fire Zone AB-FZ-3

No modifications required.

f. Fire Zone AB-FZ-4

Convert existing manually actuated deluge water spray system to automatic preaction system.

g. Fire Zone AB-FZ-5

See modifications to west boundary of fire zones AB-FZ-2a, 2b & 2c and floor of AB-FZ-6.

h. Fire Zone AB-FZ-6

Seal penetrations in floor between south wall of AB-FZ-6a and column line 7d as well as between column lines K & L (Refer to Fire Area Layout 1-FHA-027).

i. Fire Zone AB-FZ-6a

No modifications required. R6

j. Fire Zone AB-FZ-7

No modifications required.

k. Fire Zone AB-FZ-8

No modifications required.

l. Fire Zone AB-FZ-9

No modifications required.

m. Fire Zone FH-FZ-1

No modifications required.

n. Fire Zone FH-FZ-2

No modifications required.

o. Fire Zone FH-FZ-3

No modifications required.

p. Fire Zone FH-FZ-4

Duct penetration on east boundary to be sealed on the outside periphery of the duct at the penetration.

q. Fire Zone FH-FZ-5 R6

See modifications to west boundary of fire zones CB-FZ-5a and 5b and east boundary of fire zone FH-FZ-4.

r. Fire Zone FH-FZ-6

No modifications required.

s. Fire Zone CB-FZ-5a

Seal openings in sheet metal wall (west boundary) with non-combustible material. Provide one hour dampers in open duct penetration and louver.

t. Fire Zone CB-FZ-5b

Seal openings in sheet metal wall (west boundary) with non-combustible material. Provide one hour fire dampers in open duct penetration and louver.

u. Fire Area AB-FA-1

No modifications required.

v. Fire Area AB-FA-2

No modifications required.

w. Fire Zone IB-FZ-1 R6

No modifications required.

x. Fire Zone IB-FZ-2

No modifications required.

y. Fire Zone IB-FZ-3

No modifications required.

aa. Fire Zone IB-FZ-5

No modifications required.

bb. Fire Zone IB-FZ-6

No modifications required.

cc. Fire Zone IB-FZ-7

No modifications required.

dd. Fire Zone IB-FZ-8

No modifications required.

ee. Fire Zone ISPH-FZ-1

No modifications required.

ff. Fire Zone ISPH-FZ-2

No modifications required.

gg. Fire Zone ISPH-FZ-3

No modifications required. R6

hh. Fire Area CB-FA-2a

No modifications required.

ii. Fire Area CB-FA-2b

No modifications required.

jj. Fire Area CB-FA-3a

No modifications required.

kk. Fire Area CB-FA-3b

No modifications required.

ll. Fire Area CB-FA-3d

No modifications required.

R6

mm. Reactor Building

No modifications required.