

June 17, 1988

Dockets Nos. 50-315 and 50-316

Mr. Milton P. Alexich, Vice President
Indiana Michigan Power Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Alexich:

SUBJECT: UNRATED FIRE HATCHES IN FIRE AREA BOUNDARIES (TACS NOS. 61690/
61691)

By letters dated March 8 and June 15, 1984, the Indiana Michigan Power Company (IMPC) requested three technical exemptions from the requirements of Appendix R to 10 CFR 50. The three technical exemption requests concern unrated hatch covers, seismic gaps and ventilation duct penetrations located in fire area boundaries. The staff's evaluation concluded that the acceptance criteria for fire area boundaries are set forth in Appendix A to BTP APCSB 9.5-1, not in Appendix R to 10 CFR 50. Because deviations from the Appendix A guidelines do not require exemptions, the staff reviewed the fire area boundary penetrations as deviations, rather than exemptions.

By letter dated August 27, 1985, the staff accepted both the ventilation duct penetrations and seismic gaps. In addition, the staff denied the deviation requests for the unrated fire hatches because of the lack of an adequate fire hazards analysis to support the deviations.

By letters dated May 30, 1986, October 16, 1987, and May 10, 1988, IMPC provided a fire hazards analysis and additional information to justify the unrated hatches in the fire area boundaries. The Commission's Safety Evaluation is enclosed.

Based on this evaluation, the Commission concludes that the level of fire safety for each area evaluated is equivalent to that achieved by conformance with the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1, and therefore the deviations for the unrated fire hatches are acceptable.

Sincerely,

Original signed by

John F. Stang, Project Manager
Project Directorate III-1
Division of Reactor Projects - III, IV, V
& Special Projects

Enclosure:
Safety Evaluation

cc: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555

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By letters dated March 8 and June 15, 1984, the Indiana Michigan Power Company (IMPC) requested three technical exemptions from the requirements of Appendix R to 10 CFR 50. The three technical exemption requests concern unrated hatch covers, seismic gaps and ventilation duct penetrations located in fire area boundaries. The staff's evaluation concluded that the acceptance criteria for fire area boundaries are set forth in Appendix A to BTP APCS 9.5-1, not in Appendix R to 10 CFR 50. Because deviations from the Appendix A guidelines do not require exemptions, the staff reviewed the fire area boundary penetrations as deviations, rather than exemptions.

By letter dated August 27, 1985, the staff accepted both the ventilation duct penetrations and seismic gaps. In addition, the staff denied the deviation requests for the unrated fire hatches because of the lack of an adequate fire hazards analysis to support the deviations.

By letters dated May 30, 1986, October 16, 1987, and May 10, 1988, IMPC provided a fire hazards analysis and additional information to justify the unrated hatches in the fire area boundaries. The Commission's Safety Evaluation is enclosed.

Based on this evaluation, the Commission concludes that the level of fire safety for each area evaluated is equivalent to that achieved by conformance with the guidelines of Section D.1.j of Appendix A to BTP APCS 9.5-1, and therefore the deviations for the unrated fire hatches are acceptable.

Sincerely,

John F. Stang, Project Manager
Project Directorate III-1
Division of Reactor Projects - III, IV, V
& Special Projects

Enclosure:
Safety Evaluation

cc: See next page

Mr. Milton Alexich
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO FIRE PROTECTION DEVIATIONS REQUESTED FOR
INDIANA MICHIGAN POWER COMPANY
DONALD C. COOK NUCLEAR PLANT
UNITS 1 AND 2
DOCKETS NOS. 50-315 AND 50-316

1.0 INTRODUCTION

Generic Letter 86-10, dated April 24, 1986, was issued by the NRC staff to provide guidance on the implementation of staff fire protection requirements at nuclear power plants. The letter includes NRC guidance, NRC staff responses to industry questions, and a document entitled "Interpretations of Appendix R". The letter represents staff assessments of industry questions and provides guidance as to acceptable methods of satisfying regulatory requirements.

Generic Letter 86-10 states that fire area boundaries need not be completely sealed floor-to-ceiling or wall-to-wall. However, all unsealed openings should be identified and considered in evaluating the effectiveness of the overall barrier. Where fire area boundaries are not complete barriers with all penetrations sealed, licensees must perform an evaluation to assess the adequacy of the boundaries to determine if the boundaries will withstand the hazards associated with the area. Although not required, licensees may submit their evaluations for staff review and concurrence. The Indiana Michigan Power Company (IMPC or the licensee) chose to submit their evaluations.

By letters dated March 8, and June 15, 1984, the IMPC requested three technical exemptions from the requirements of Appendix R to 10 CFR 50. The three technical exemption requests concern unrated hatch covers, seismic gaps and ventilation duct penetrations located in fire area boundaries. The NRC staff's evaluation concluded that the acceptance criteria for fire area boundaries are set forth in Appendix A to BTP APCS 9.5-1, not in Appendix R to 10 CFR 50. Because deviations from the Appendix A guidelines do not require exemptions, the staff reviewed the fire area boundary penetrations as deviations, rather than exemptions.

By letter dated August 27, 1985, the NRC staff forwarded the acceptance of both the ventilation duct penetrations and seismic gaps. In addition, the staff denied the deviation request for the unrated fire hatches because of the lack of an adequate fire hazards analysis to support the deviations.

By letters dated May 30, 1986, October 16, 1987, and May 10, 1988, IMPC provided a fire hazards analysis and additional information to justify the unrated hatches in the fire area boundaries.

This evaluation is based in part on a Technical Evaluation Report (TER) written by NRC contractor, Science Applications International Corporation (SAIC). The TER has been reviewed by the NRC staff, and the staff agrees with the conclusions reached in the SAIC TER.

2.0 ESSENTIAL SERVICE WATER PUMP HOUSE

2.1 DEVIATION REQUESTED

A deviation was requested from Section D.1.j of Appendix A to BTP APCSB 9.5-1 to the extent that floors, walls and ceilings enclosing separate fire areas should have minimum fire ratings of three hours. Specifically, the licensee has identified an unrated steel hatch, an undampened ventilation duct and screen mesh access gates in fire area boundaries surrounding Essential Service Water Pumps and Circulating Water Pump Motor Control Room.

2.2 DISCUSSION

Fire Zones 29A and 29B are the Unit 1 Essential Service Water (ESW) Pump Cubicles while Zones 29C and 29D house the Unit 2 ESW Pumps. The Circulating Water Pump Motor Control Room, Zone 29G, is located directly below all four pump cubicles. Zones 29A and 29B are separated from Zones 29C and 29D by a 3-hour rated barrier. Undampened HVAC supply air openings exist in the ceiling of each of the ESW Pump Cubicles, although, by letter dated May 30, 1987, the licensee committed to install 3-hour rated dampers in the Unit 2 cubicle air openings. Unsealed piping penetrations are present in the Unit 1 cubicles while the piping penetrations in the Unit 2 ceiling are sealed. Access to Zone 29G is provided from an open curbed stairway from Zone 29B. Access to Zone 29C is provided by an unrated steel hatch in the ceiling of Zone 29G. Access to the screen house area from the pump rooms is provided through steel mesh gates.

The Unit 1 ESW Pumps provide alternate shutdown capabilities for Unit 2 and the Unit 2 pumps provide alternate shutdown capability to Unit 1. Zone 29G contains ESW Pump power cables for both Units, however, the cables are in conduits which are protected with 1-hour rated material.

Early warning fire detection has been installed in the Unit 1 and Unit 2 pump cubicles and Zone 29G. The early warning detection alarms in the control room. Fire suppression consists of extinguishers and manual hose stations provided throughout the zones. By letter dated June 14, 1983, an exemption from Section III.G of Appendix R to 10 CFR 50 was granted for Zones 29A, B, C and D to the extent that a fixed suppression system is not provided in an area where alternate shutdown is provided.

The combustible loading for the ESW Pump Cubicles, Fire Zones 29A, B, C and D is approximately 7,000 Btu/ft² each. The loading for Zone 29G is less than 13,000 Btu/ft². These loadings correspond to an equivalent fire severity per ASTM E119 of less than 10 minutes.

2.3 EVALUATION

The fire boundaries of the ESW Pump Cubicles and Circulating Water Pump Motor Control Room deviate from the requirements of Section D.1.j of Appendix A to BTP APCSB 9.5-1 to the extent that they contain openings and an unrated hatch thereby making the fire area boundaries not 3-hour rated. The concern is that a fire could propagate from one of the pump cubicles in one unit to the pump cubicles of the other unit and affect the ability of the plant to safely shut down.

However, the combustible loading in all of the areas of concern is low with an equivalent fire severity of under 10 minutes for each zone. The one zone which would have been a concern was the roof area which is used for the storage of wood and other combustibles. This would have allowed for the possibility for a fire to spread up through one of the air openings and then across and down through other openings in the other unit's pump cubicles. However, the licensee has committed to provide 3-hour rated dampers in the Unit 2 openings which would prevent this scenario from occurring. Another concern would be the possibility that a fire in either Zone 29B, 29G or 29C could propagate to the other two zones via the stairway and the unrated steel hatch. Since the combustible loading in each of the three areas is low, it is not probable that a single fire could travel the stairway in either direction and also cause the steel hatch to fail and spread to the zone on the opposite side. Flammable liquids would be prevented from traveling down the stairway due to a six inch curb at the top. For a fire to affect pumps from both units through the mesh access gates, it would have to travel 175 feet through an area with a combustible loading of under 10 minutes. The lack of combustibles provides reasonable assurance that this scenario is not probable. If a fire were to occur in any of the zones of concern, it would be expected that the early warning detection would alert Control Room personnel who in turn would notify the fire brigade. Due to the low combustible loading, it would also be expected that the brigade could control the fire prior to it spreading out of the zone of origin. Therefore, there is reasonable assurance that the lack of complete 3-hour boundaries of the Essential Service Water Pump Cubicles and the Circulating Water Pump Motor Control Room does not adversely affect plant fire safety or the ability of the plant to safely shutdown.

2.4 CONCLUSION

Based on the above evaluation, it is concluded that the existing fire protection features of the ESW Pump Cubicles and the Motor Control Room, combined with the licensee's commitment to install 3-hour dampers, provide an acceptable level of protection in accordance with the guidelines of Section D.1.j of Appendix A to BTP APCS 9.5-1. Therefore, the deviation for the unrated hatch, undampened air openings and screen mesh access gates is acceptable.

3.0 HATCH BETWEEN FIRE AREA 41 AND FIRE AREA 55, UNIT 1 HATCH BETWEEN FIRE AREA 45 AND FIRE AREA 60, UNIT 2

3.1 DEVIATION REQUESTED

A deviation was requested from Section D.1.j of Appendix A to BTP APCS 9.5-1 to the extent that floors, walls and ceilings enclosing separate fire areas should have minimum fire ratings of three hours. Specifically, the licensee has identified unrated steel hatches in the ceiling between Fire Area 41 and Fire Area 55 and Fire Area 45 and Fire Area 60.

3.2 DISCUSSION

Fire Area 41 comprises the Unit 1 Engineering Safety System and MCC Room while Fire Area 55 is the Unit 1 Switchgear Room Cable Vault. Fire Area 45 and Fire Area 60 correspond to the Unit 2 Engineering Safety System and MCC Room and the Unit 2 Switchgear Room Cable Vault. Since both Unit 1 and Unit 2 are similar, this discussion and following evaluation will only refer to the Unit 1 side. All of the fire areas are located in the Auxiliary Building. The barrier separating the two adjacent areas is constructed of reinforced concrete

with a 3-hour fire rating, however, an unrated steel hatch is located in the barrier to provide access to the battery room enclosure of Fire Area 55.

Fire Area 41 and Fire Area 55 contain redundant cables and equipment required for safe shutdown. However, alternate shutdown capability outside of both fire areas is provided using Unit 2 equipment. (Unit 1 provides alternate shutdown capability for Unit 2.)

Both fire areas are provided with early warning detection which alarms in the control room. Both areas are also provided with total flooding automatic carbon dioxide systems with the exception of the Battery Room Enclosure. Manual hose stations and portable extinguishers are located throughout both areas.

The combustible loading in Fire Area 41 is approximately 23,000 Btu/ft² while loading in Fire Area 55 is approximately 40,000 Btu/ft². These correspond to an equivalent fire severity per ASTM E119 of 17 minutes and 30 minutes respectively. (The combustible loadings for the Unit 2 areas are slightly less.)

3.3 EVALUATION

The barrier between Fire Areas 41 and 55 deviates from the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1 because it contains an unrated steel hatch and is therefore not a complete 3-hour rated barrier. The concern is that a fire in either area may propagate through the unrated hatch affecting redundant safe shutdown cables and components in the adjacent fire area. However, the combustible loading in both areas is low. Detection and automatic suppression is provided in both areas. It would be expected that if a fire were to occur, it would be detected in its incipient stages and control room personnel would be notified. The control room would then alert the plant fire brigade who would extinguish the fire using the available manual hose stations or portable extinguishers. In addition, the automatic suppression provides further assurance that a fire would not propagate between the areas. Although, no automatic suppression is provided in the battery room enclosure itself, automatic suppression is directly on the opposite side of the steel hatch in Fire Area 41 and in all other areas of Fire Area 55, providing reasonable assurance that a fire would not propagate into both areas. Also, complete alternate shutdown capability is provided outside of both areas. If a fire were to propagate through the hatch, the plant could still safely shut down. Therefore, the presence of an unrated steel hatch in the fire barrier between Fire Areas 41 and 55 does not adversely affect plant safety.

3.4 CONCLUSION

Based on the above evaluation, it is concluded that the existing fire protection features in Fire Area 41 and Fire Area 55, Unit 1, and Fire Area 45 and Fire Area 60, Unit 2, provide an acceptable level of protection in accordance with the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1. Therefore, the deviation for the unrated steel hatch in the ceiling between Fire Areas 41 and 55 and Fire Areas 45 and 60 is acceptable.

4.0 HATCH BETWEEN FIRE AREA 53 AND FIRE AREA 57, UNIT 1 HATCH BETWEEN FIRE AREA 54 AND FIRE AREA 58, UNIT 2

4.1 DEVIATION REQUESTED

A deviation was requested from Section D.1.j of Appendix A to BTP APCS 9.5-1 to the extent that floors, walls and ceilings enclosing separate fire areas should have minimum fire ratings of three hours. Specifically, the licensee has identified unrated steel hatches between the Unit 1 Control Room, Fire Area 53, and the Unit 1 Control Room Cable Vault, Fire Area 57, and the Unit 2 Control Room, Fire Area 54, and the Unit 2 Control Room Cable Vault, Fire Area 58.

4.2 DISCUSSION

The Unit 1 and Unit 2 sides are similar in configuration. For purposes of this discussion and following evaluation, only the Unit 1 side will be referred to.

Fire Area 53 is located on the 633 ft. elevation of the Auxiliary Building. Fire Area 57 is located directly below on the 624 ft. elevation.

The barrier separating the two areas is constructed of reinforced concrete with a 3-hour fire rating, however an unrated steel hatch is located in the barrier.

Fire Areas 53 and 57 contain redundant safe shutdown instrumentation and cabling. However, complete alternate shutdown capability is provided outside of both fire areas using Unit 2 equipment. (Unit 1 provides alternate shutdown capability for Unit 2.)

Both fire areas are provided with early warning detection. Fire Area 57 is protected by an automatic total flooding Halon 1301 system and by a manually actuated total flooding carbon dioxide system. Fire Area 53 is not provided with a suppression system. Manual hose stations and portable extinguishers are provided in both areas.

The combustible loading in Fire Area 57 is approximately 95,000 Btu/ft². The loading in Fire Area 53 is under 13,000 Btu/ft². These correspond to equivalent fire severities of 71 minutes and 10 minutes respectively. (The loadings for the similar Unit 2 areas are 67 minutes and 15 minutes respectively.)

4.3 EVALUATION

The barrier between Fire Areas 53 and 57 deviates from the guidelines of Section D.1.j of Appendix A to BTP APCS 9.5-1 because it contains an unrated steel hatch and is therefore not a complete 3-hour rated barrier. The concern is that a fire in either area may propagate through the unrated hatch affecting redundant safe shutdown cables and components in the adjacent fire area. However, the combustible loading in the Control Room, Fire Area 53, is low, under 15 minutes. In addition the area is continuously manned. If a fire were to occur, it would be detected immediately and extinguished using available portable fire extinguishers. Although the combustible loading in Fire Area 57 is moderate, approximately one hour, the area is provided with both automatic and manual suppression systems in addition to early warning detectors. If a fire were to occur, it could be expected that it would be

detected in its incipient stages. Control Room personnel would then notify the plant fire brigade who could extinguish the fire using the manual hose stations or extinguishers. The automatic Halon 1301 system and the back-up manual carbon dioxide system provide reasonable assurance that a fire would not propagate to the Control Room above. Alternate shutdown capabilities outside of both fire areas ensure that if a fire were to propagate through the hatch, safe plant shutdown could still be achieved. Therefore, the unrated steel hatch between Fire Areas 53 and 57 (Fire Areas 54 and 58) does not adversely affect plant safety.

4.4. CONCLUSION

Based on the above evaluation, it is concluded that the existing fire protection features in Fire Areas 53 and 57 and Fire Areas 54 and 58 provide an acceptable level of protection in accordance with the guidelines of Section D.1.j of Appendix A to BTP APCS 9.5-1. Therefore, the deviation for the unrated steel hatches in the ceiling between Fire Areas 53 and 57 and Fire Areas 54 and 58 is acceptable.

5.0 HATCH BETWEEN FIRE ZONE 40B AND FIRE AREA 55 HATCH BETWEEN FIRE ZONE 47B AND FIRE AREA 60

5.1 DEVIATION REQUESTED

A deviation was requested from Section D.1.j of Appendix A to BTP APCS 9.5-1 to the extent that floors, walls and ceilings enclosing separate fire areas should have minimum fire ratings of three hours. Specifically, the licensee has identified unrated steel hatches between the Unit 1 4KV Switchgear Room, Fire Zone 40B, and the Unit 1 Switchgear Room Cable Vault, Fire Area 55, and between the Unit 2 4KV Switchgear Room, Fire Zone 47B, and the Unit 2 Switchgear Room Cable Vault, Fire Area 60.

5.2 DISCUSSION

The Unit 1 side and Unit 2 side are similar in configuration. For purposes of this discussion and following evaluation, only the Unit 1 side will be referred to.

Fire Zone 40B is located on the 609 ft.-6 in. elevation of the Auxiliary Building. It is part of a larger fire area that includes Fire Zone 40A. Fire Area 55 is located directly above Fire Zone 40B on the 625 ft.-10 in. elevation. The barrier separating the two areas is constructed of reinforced concrete with a 3-hour rating, however, an unrated steel hatch is located in the barrier.

Fire Zone 40B and Fire Area 55 contain redundant cables and equipment required for safe shutdown. However, complete alternate shutdown capability is available outside of both fire areas using Unit 2 equipment. (Unit 1 provides alternate shutdown capability for Unit 1.)

Both fire areas are provided with early warning detection. Both fire areas are also provided with automatic total flooding carbon dioxide systems with the exception of the CD Battery Room in Fire Area 55. However, the steel hatch is not located in the area of the battery room. Manual hose stations and portable extinguishers are provided throughout both fire areas.

The fire loading in Fire Zone 40B is approximately 21,000 Btu/ft². The loading in Fire Area 55 is approximately 40,000 Btu/ft². These correspond to equivalent fire severities per ASTM E119 of 15 minutes and 30 minutes respectively. (The loadings for the similar Unit 2 areas are 15 minutes and 24 minutes respectively.)

5.3 EVALUATION

The barrier between Fire Zone 40B and Fire Area 55 deviates from the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1 because it contains an unrated steel hatch and is therefore not a complete 3-hour rated barrier. The concern is that a fire in either area may propagate through the unrated hatch affecting redundant safe shutdown cables and components in the adjacent fire area. However, the combustible loading in both fire areas is low, less than 30 minutes. Any fire would be expected to develop slowly with an initially low heat output. In addition, the early warning detection would be expected to alert Control Room operators of a fire in its incipient stages. The Control Room personnel would then alert the plant fire brigade who would extinguish the fire with the available manual hose stations or portable extinguishers. The automatic suppression systems provide further assurance that a fire would not propagate from one area to the other. Therefore, there is reasonable assurance that the unrated steel hatch between Fire Zone 40B and Fire Area 55 (Fire Zone 47B and Fire Area 60) does not adversely affect plant safety.

5.4 CONCLUSION

Based on the above evaluation, it is concluded that the existing fire protection features in Fire Zone 40B and Fire Area 55 and Fire Zone 47B and Fire Area 60 provide an acceptable level of protection in accordance with the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1. Therefore, the deviation for the unrated steel hatches between Fire Zone 40B and Fire Area 55 and between Fire Zone 47B and Fire Area 60 is acceptable.

6.0 HATCH BETWEEN THE ACCESS CONTROL AREA (FIRE ZONE 43) AND THE UNIT 1 AUXILIARY CABLE VAULT (FIRE AREA 56)

6.1 DEVIATION REQUESTED

A deviation was requested from Section D.1.j of Appendix A to BTP APCSB 9.5-1 to the extent that floors, walls and ceilings enclosing separate fire areas should have minimum fire ratings of three hours. Specifically, the licensee has identified an unrated steel hatch in the barrier between the Access Control Area and the Unit 1 Auxiliary Cable Vault, Fire Zone 43, and Fire Area 56 respectively.

6.2 DISCUSSION

Fire Zone 43 is located on the 609 ft.-6 in. elevation of the Auxiliary Building. It is part of a larger fire area that includes Fire Zones 37, 44N, 44S and 44A through 44H. Fire Area 56 is located directly above Fire Zone 43 on the 620 ft.-6 in. elevation of the Auxiliary Building. The barrier separating the two zones is constructed of reinforced concrete with a 3-hour fire rating, however, an unrated steel hatch is located in the barrier.

Both Fire Zone 43 and Fire Area 56 contain redundant cables required for safe shutdown. By letter dated October 16, 1987, the licensee confirmed that complete alternate shutdown capability is available outside of both areas, using Unit 2 equipment.

Both fire areas are provided with early warning detectors. Fire Area 56 is protected by an automatic total flooding carbon dioxide system. Fire Zone 43 has no installed suppression systems. Both areas contain manual hose stations and portable extinguishers.

The combustible loadings in Fire Zone 43 and Fire Area 56 are 13,000 Btu/ft² and 70,000 Btu/ft² respectively. These correspond to equivalent fire severities per ASTM E119 of 10 minutes and 51 minutes.

6.3 EVALUATION

The barrier between Fire Zone 43 and Fire Area 56 deviates from the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1 because it contains an unrated steel hatch and is therefore not a complete 3-hour rated barrier. The concern is that a fire in either area may propagate through the unrated hatch affecting redundant safe shutdown cables and components in the adjacent fire area. However, the combustible loading in Fire Zone 43 is very low, less than 10 minutes. The combustible loading in Fire Area 56 is higher, approximately 51 minutes, however this area is provided with an automatic suppression system. Both areas have detection which would be expected to alert the Control Room of any fire in its incipient stages. The plant fire brigade would then be alerted and could extinguish the fire using the available manual hose stations or portable fire extinguishers. The automatic suppression system in Fire Area 56 and the very low combustible loading in Fire Zone 43 provide reasonable assurance that a fire would not propagate through the unrated steel hatch to the adjacent area. Even if fire were to breach the hatch, complete alternate shutdown capabilities are available outside of both fire areas. Therefore, the unrated steel hatch between Fire Zone 43 and Fire Area 56 does not adversely affect plant safety.

6.4 CONCLUSION

Based on the above evaluation, it is concluded that the existing fire protection features in Fire Zone 43 and Fire Area 56 provide an acceptable level of protection in accordance with the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1. Therefore, the deviation for the unrated steel hatch between Fire Zone 43 and Fire Area 56 is acceptable.

7.0 HATCH BETWEEN THE AUXILIARY BUILDING 633 FT. ELEVATION (FIRE ZONE 52) AND THE AUXILIARY BUILDING CABLE VAULT (FIRE AREA 59)

7.1 DEVIATION REQUESTED

A deviation was requested from Section D.1.j of Appendix A to BTP APCSB 9.5-1 to the extent that floors, walls and ceilings enclosing separate fire areas should have minimum fire ratings of three hours. Specifically, the licensee has identified an unrated steel hatch in the barrier between elevation 633 ft. of the Auxiliary Building and the Auxiliary Cable Vault, Fire Zone 52, and Fire Area 59, respectively.

7.2 DISCUSSION

Fire Zone 52 is located on the 633 ft. elevation of the Auxiliary Building. It is part of a larger area that includes Fire Zones 49, 50, 51, 3, 32, 69, 36, and 48. Fire Area 59 is located directly below the southwest corner of Fire Zone 52 on the 622 ft.-6 in. elevation of the Auxiliary Building. The barrier separating the two areas is constructed of reinforced concrete with a 3-hour fire rating, however it contains an unrated steel hatch.

Fire Zone 52 contains redundant cables required for the safe shutdown of both Units 1 and 2. However, complete alternate shutdown capabilities exist outside of this area for safely shutting down both units. Fire Area 59 contains redundant safe shutdown cables required for Unit 2. By letter dated October 16, 1987, the licensee stated that alternate shutdown capabilities for Unit 2 are available outside of both Fire Zone 52 and Fire Area 59 for all necessary functions except CCW. In this case, a fire propagating through the hatch could affect both trains of CCW. The licensee provided additional information regarding the locations of the redundant CCW cables and equipment relative to the unrated steel hatch. Cables and equipment for the west train of Unit 2 CCW (2-CCW1W) are located in Fire Zone 52, 15 feet north and 55 feet east of the hatch and 105 feet north and 70 feet east of the hatch. Redundant cables for the east train of CCW (2-CCW2E) are located in Fire Area 55, 10 feet east and 1 foot below the hatch.

Both Fire Zone 52 and Fire Area 59 are provided with early warning detectors. Fire Zone 52 is protected by a preaction sprinkler system. Fire Area 59 has a total flooding carbon dioxide system. Both areas have manual hose stations and portable fire extinguishers throughout.

Fire Zone 52 is located in a fire area with an average combustibile loading of 7000 Btu/ft² for an equivalent fire severity of 5 minutes. On the elevation Zone 52 is located, the average combustibile loading is 14,000 Btu/ft². The combustibile loading for Fire Zone 52 only is under 5000 Btu/ft² or under 3 minutes. Fire Area 59 has a combustibile loading of under 55,000 Btu/ft² or approximately 41 minutes.

7.3 EVALUATION

The barrier between Fire Zone 52 and Fire Area 59 deviates from the guidelines of Section D.1.j of Appendix A to BTP APCS 9.5-1 because it contains an unrated steel hatch and is therefore not a complete 3-hour rated barrier. The concern is that a fire in either area may propagate through the unrated hatch affecting redundant safe shutdown cables and components in the adjacent fire area. However, the combustibile loading in Fire Zone 52 is very low, less than 3 minutes. The combustibile loading in Fire Area 59 is higher although still low, approximately 41 minutes. Both areas have detection which would be expected to alert the Control Room of any fire in its incipient stages. The plant fire brigade would then be alerted and could extinguish the fire using the available manual hose stations or portable fire extinguishers. The preaction sprinkler system in Fire Zone 52 and the automatic carbon dioxide system in Fire Area 59 provide reasonable assurance that a fire would not propagate through the unrated steel hatch to the adjacent area. Additionally, alternate shutdown capabilities are available outside of both fire areas with the exception of CCW. For a fire to affect both trains of CCW, the steel

hatch would have to fail allowing the fire to travel the approximately 65 feet horizontal distance between the two closest redundant components. With both areas having low combustible loadings and being provided with detection and automatic suppression, this is not considered to be probable. Therefore, the unrated steel hatch between Fire Zone 52 and Fire Area 59 does not adversely affect plant safety.

7.4 CONCLUSION

Based on the above evaluation, it is concluded that the existing fire protection features in Fire Zone 52 and Fire Area 59 provide an acceptable level of protection in accordance with the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1. Therefore, the deviation for the unrated steel hatch between Fire Zone 52 and Fire Area 59 is acceptable.

8.0 HATCH BETWEEN THE HVAC EQUIPMENT ROOMS (FIRE ZONES 70 AND 73) AND THE UNIT 1 AND UNIT 2 MAIN CONTROL ROOMS (FIRE ZONES 53 AND 54)

8.1 DEVIATION REQUESTED

A deviation was requested from Section D.1.j of Appendix A to BTP APCSB 9.5-1 to the extent that floors, walls and ceilings enclosing separate fire areas should have minimum fire ratings of three hours. Specifically, the licensee has identified unrated steel hatches in the barrier between the HVAC Equipment Rooms (Fire Zones 70 and 73) and the Unit 1 and 2 Control Rooms (Fire Zones 53 and 54).

8.2 DISCUSSION

Fire Zones 70 and 73 are located on the 650 ft. elevation of the Auxiliary Building. These fire zones are part of a larger fire area directly above the Control Rooms which also includes the Unit 1 and 2 Computer Rooms, Fire Zones 71 and 72. Unrated hatches provide access from the Control Rooms to the corresponding unit's HVAC Equipment Rooms.

The Fire Area containing Zones 70, 71, 72 and 73 contains no safe shutdown equipment. The Control Rooms contain redundant safe shutdown components, however, alternate shutdown capability exists outside of the Control Rooms.

All fire zones are provided with early warning detectors. Fire Zones 71 and 72 have automatic Halon 1301 suppression systems. The charcoal filter units in Fire Zones 70 and 73 are provided with thermistor strip detectors and manual deluge systems. The Control Rooms are not provided with suppression systems although they are continuously manned and all zones contain manual hose stations and portable fire extinguishers.

The combustible loading in Zones 70, 71, 72, and 73 is 11,040 Btu/ft² or less than 10 minutes. The combustible loading for each of the control rooms is also less than 10 minutes.

8.3 EVALUATION

The barrier between Fire Zones 70 and 73 and Fire Zones 53 and 54 deviates from the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1 because

it contains an unrated hatch and is therefore not a complete 3-hour rated barrier. The concern is that a fire would travel from one of the zones through both hatches thereby affecting both Control Rooms. However, the combustible loading in all of the zones in question is low, less than 10 minutes. Any fire that were to start would be expected to develop slowly with a low heat output. All areas are provided with detectors. In addition, the Control Rooms are continuously manned. Any fire should be detected in its incipient stages and extinguished with manual suppression equipment either by Control Room personnel or the plant fire brigade. For a fire to affect both Control Rooms, it would have to travel a tortuous path through both HVAC Equipment Rooms and breach two hatches in areas where the combustible loading is minimal. This scenario is not considered to be probable and therefore it is determined that the unrated hatches in the ceiling of the Control Rooms do not adversely affect plant safety.

8.4 CONCLUSION

Based on the above evaluation, it is concluded that the existing fire protection features in Fire Zones 70, 71, 72, 73 and Fire Zones 53 and 54 provide an acceptable level of protection in accordance with the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1. Therefore, the deviations for the unrated hatches between Fire Zones 70 and 73 and Fire Zones 53 and 54 are acceptable.

9.0 SUMMARY

Based on the above evaluations, the NRC staff concludes that the level of fire safety for the areas evaluated is equivalent to that achieved by conformance with the guidelines of Section D.1.j of Appendix A to BTP APCSB 9.5-1, and therefore, the following deviations for unrated openings in fire rated barriers are found to be acceptable:

1. Essential Service Water Pump House unrated hatch, open stairwell and steel mesh doors.
2. Unrated hatch between the Unit 1 Engineering Safety System and MCC Room (Fire Area 41) and the Unit 1 Switchgear Room Cable Vault (Fire Area 55).
3. Unrated hatch between the Unit 2 Engineering Safety System and MCC Room (Fire Area 45) and the Unit 2 Switchgear Room Cable Vault (Fire Area 60).
4. Unrated hatch between the Unit 1 Control Room (Fire Area 53) and the Unit 1 Control Room Cable Vault (Fire Area 57).
5. Unrated hatch between the Unit 2 Control Room (Fire Area 54) and the Unit 2 Control Room Cable Vault (Fire Area 58).
6. Unrated hatch between the Unit 1 4KV Switchgear Room (Fire Zone 40B) and the Unit 1 Switchgear Room Cable Vault (Fire Area 55).
7. Unrated hatch between the Unit 2 4KV Switchgear Room (Fire Zone 47B) and the Unit 2 Switchgear Room Cable Vault (Fire Area 60).
8. Unrated hatch between the Access Control Area (Fire Zone 43) and the Unit 1 Auxiliary Cable Vault (Fire Area 56).

9. Unrated hatch between the Auxiliary Building 633 ft. elevation (Fire Zone 52) and the Auxiliary Building Cable Vault (Fire Area 59).
10. Unrated hatches between the HVAC Equipment Rooms (Fire Zones 70 and 73) and the Unit 1 and Unit 2 Main Control Room (Fire Zone 53 and 54).