UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

February 25, 1988

Docket Nos. 50-280
and 50-281

Mr. W. L. Stewart
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Dear Mr. Stewart:

SUBJECT: TECHNICAL EXEMPTION REQUESTS FROM APPENDIX R, 10 CFR PART 50
SURRY POWER STATION, UNITS NO. 1 AND 2 (TAC NOS. 55332 AND 55333)

By letter dated July 6, 1984, as revised by letters dated November 30, 1984, April 10, 1986, September 30, 1986, and October 16, 1987, the Virginia Electric and Power Company (VEPCO) requested a number of exemptions from the technical requirements of Appendix R to 10 CFR Part 50. Enclosed you will find the NRC exemption and safety evaluation (SE).

Based on our evaluation, exemptions have been granted for both units in the following areas:

1. Lack of 20 feet of separation between redundant excore neutron flux detector cables in the containment incore instrument tunnels;

2. Lack of 20 feet of separation free of intervening combustible materials between redundant systems in containment;

3. Lack of a 3-hour fire barrier separating redundant shutdown circuits in a manhole adjacent to fuel oil pumphouse;

4. Lack of 8-hour battery powered emergency lighting units in certain plant locations; and

5. Lack of direct readings of process monitoring variables necessary to perform and control required safe-shutdown functions at the refueling water storage tanks.

Also, we find that the level of fire safety provided in the following areas is consistent with the guidance issued in Generic Letter 86-10. Therefore, no exemptions are necessary:

1. Emergency switchgear room fire door frames (Fire Area 4).

2. Fire doors, frames not fire rated (various fire areas).

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3. Fire doors, conduit in door frames (various fire areas).

4. Control room stairwell/emergency switchgear room wall (Fire Area 5).

5. Cable vaults/tunnels and fire barrier rating auxiliary buildings' fire wall (fire areas 1 and 2).

6. Auxiliary/turbine buildings' pipe tunnel lack of fire barrier (Fire Area 17).

7. Conduit passing through rated fire barriers (lack of internal seals) - (various fire areas).

8. Lack of area-wide fire detection and suppression systems (various fire areas).

9. Lack of protection of low current instrument circuits and 125-Vdc circuits (various fire areas).

Finally, VEPCO's letter dated October 16, 1987, withdrew the exemption request entitled, "Establishing Letdown - Using Non-shift Personnel." Therefore, this request is not addressed in this evaluation.

This completes our review of your exemption requests. The review of the safe shutdown methodology is being handled separately.

A copy of the notice of exemption is being filed with the Office of the Federal Register for publication.

Sincerely,

Steven A. Varga, Director
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Exemption
2. Safety Evaluation

cc w/enclosures: See next page

DISTRIBUTION

Docket File	G. Lainas	J. Partlow	Gray File
NRC & Local PDRs	D. Miller	T. Barnhart (8)	
PD22 Reading	C. Patel	ACRS (10)	
T. Murley/J. Sniezek	OGC-Bethesda	GPA/PA	
C. Rossi	E. Jordan	ARM/LFMB	

*See previous concurrence

*LA:PDII-2	*PM:PDII-2	*CEB	D:PDII-2*	OGC	AD:PD22A
DMiller	CPatel:bg	McCracken	HBerkow		GLainas
12/23/87	12/23/87	01/04/88	01/07/88	02/9/88	02/11/88

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3. Fire doors, conduit in door frames (various fire areas).

4. Control room stairwell/emergency switchgear room wall (Fire Area 5).

5. Cable vaults/tunnels and fire barrier rating auxiliary buildings' fire wall (fire areas 1 and 2).

6. Auxiliary/turbine buildings' pipe tunnel lack of fire barrier (Fire Area 17).

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*See previous concurrence

*LA:PDII-2	*PM:PDII-2	*CEB	D:PDII-2	OGC	AD:PD2A
DMiller	CPatel:bg	McCracken	HBerkow		GLainas
12/23/87	12/23/87	01/04/88	01/7/88	01/28/88	01/ /88

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3. Fire Doors, Conduit in Door Frames (Various Fire Areas).

4. Control Room Stairwell/Emergency Switchgear Room Wall (Fire Area 5).

5. Cable Vaults/Tunnels and Fire Barrier Rating Auxiliary Buildings' Fire Wall (Fire Areas 1 and 2).

6. Auxiliary/Turbine Buildings' Pipe Tunnel Lack of Fire Barrier (Fire Area 17).

7. Conduit Passing through Rated Fire Barriers (Lack of Internal Seals) - (Various Fire Areas).

8. Lack of area-wide fire detection and suppression systems (Various Fire Areas).

9. Lack of protection of low current instrument circuits and 125-Vdc circuits (Various Fire Areas).

Finally, VEPCO's letter dated October 16, 1987, withdrew the exemption request entitled, "Establishing Letdown - Using Non-shift Personnel." Therefore, this request is not addressed in this evaluation.

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Sincerely,

Steven A. Varga, Director
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Exemption
2. Safety Evaluation
3. Technical Evaluation Report

LA:PDII-2	PM:PDII-2	CEB	D:PDII-2	OGC	AD:PD2A	NRR/DRP
DMiller	CPatel:bg	McCracken	HBerkow		GLainas	SVarga
12/23/87	12/23/87	12/4/87	12/ /87	12/ /87	12/ /87	12/ /87

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Virginia Electric and Power Company

Surry Power Station

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Richmond, Virginia 23219

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	Docket Nos. 50-280 and 50-281
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	
	)	
(Surry Power Station, Units 1 and 2)	)	

EXEMPTION

I.

The Virginia Electric and Power Company (VEPCO, the licensee) is the holder of Operating License No. DPR-32, which authorizes operation of Surry Power Station Unit 1, and Operating License No. DPR-37, which authorizes operation of Surry Power Station Unit 2. The operating licenses provide, among other things, that the Surry Power Station is subject to all rules, regulations, and Orders of the Commission now or hereafter in effect.

The station comprises two pressurized water reactors at the licensee's site located in Surry, Virginia.

II.

On November 19, 1980, the Commission published a revised Section 50.48 and a new Appendix R to 10 CFR 50 regarding fire protection features of nuclear power plants. The revised Section 50.48 and Appendix R became effective on February 17, 1981. Section III of Appendix R contains 15 subsections, lettered A through O, each of which specifies requirements for a particular aspect of the fire protection features at a nuclear power plant. Three of the subsections, III.G, III.J, and III.L, are the subject of the licensee's exemption requests.

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Subsection III.G.2 of Appendix R requires that one train of cables and equipment necessary to achieve and maintain safe shutdown be maintained free of fire damage by one of the following means:

a. Separation of cables and equipment and associated nonsafety circuits of redundant trains by a fire barrier having a 3 hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier.

b. Separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

c. Enclosure of cable and equipment and associated nonsafety circuits of one redundant train in a fire barrier having a 1 hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

Subsection III.G.3 of Appendix R requires that in areas where alternative or dedicated shutdown is provided, fire detection and a fixed fire suppression system shall also be installed in the area, room, or zone under consideration.

Subsection III.J of Appendix R requires that emergency lighting units with at least an 8 hour battery-powered supply be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

Subsection III.L.2 of Appendix R requires that certain performance goals for the shutdown functions shall be met.

By letter dated July 6, 1984, the licensee requested exemptions from Sections III.G, III.J, and III.L of Appendix R. By letters dated November 30, 1984, April 10, 1986, and October 16, 1987, the licensee transmitted revisions to its Appendix R evaluation.

III.

The following list of exemption requests, therefore, reflects the latest status:

1. Containment Incore Instrument Tunnels (Fire Areas 15 and 16).

   An exemption was requested from the specific requirement of Section III.G.2.d to the extent that less than 20 feet of separation exists between redundant excore neutron flux detector cables in these areas.

2. Separation of Instrumentation Inside the Containments (Fire Areas 15 and 16).

   An exemption was requested from the specific requirement of Section III.G.2.d to the extent that intervening combustibles exist between redundant cables and equipment separated by 20 feet or by radiant energy shields.

3. Emergency Lighting in the Containments, Main Control Room, and in Exterior Access Routes.

   Exemptions were requested from the specific requirements of Section III.J to the extent that it requires 8 hour emergency lighting in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

4. Refueling Water Storage Tank.

   An exemption was requested from the specific requirement of Section III.L.2.d to the extent that process monitoring is not capable of providing direct readings of process variables necessary to perform and control required safe shutdown functions.

5. Redundant Circuits in a Manhole Adjacent to Fuel Oil Pumphouse Room 2 (Fire Area 18B).

An exemption was requested from the specific requirement of Section III.G.2.a to the extent that cables of redundant trains are not separated by a fire barrier having a 3 hour fire resistance rating.

In summary, exemptions were requested from the requirements of separating cables and associated nonsafety circuits of redundant trains by 3 hour rated fire barriers as discussed in Section III.G.2.a of Appendix R, and from providing horizontal separation of more than 20 feet with no intervening combustibles as required by Sections III.G.2.b and III.G.2.d. In addition, exemptions were requested from the emergency lighting requirements of Section III.J. Also, an exemption was requested from the requirement of providing direct reading of process variables as discussed in Section III.L.2.d.

The licensee has provided alternative and/or acceptable levels of fire protection for areas containing redundant safe shutdown systems not separated from each other. Fire protection in areas containing more than the negligible combustible load and containing safe shutdown equipment or cables consists of fire detectors, portable extinguishers, and hose stations.

As discussed in the staff's Safety Evaluation dated February 25, 1988, the staff concludes that the areas under consideration are expected to contain the minimum amount of combustible loading. Also, there are other features, such as separation between cables, installation of cables in rigid conduit and fire stop provide a reasonable assurance that a fire in these areas would be of low magnitude, promptly detected, and extinguished.

Based on the staff's review of the licensee's analyses, the staff concludes that the level of fire protection provided is equivalent to the technical requirements of Sections III.G, III.J, and III.L of Appendix R. Additional details concerning the exemptions are provided in the Safety Evaluation dated February 25, 1988.

By letter dated September 30, 1986, the licensee provided information relevant to the "special circumstances" finding required by revised 10 CFR 50.12(a). The licensee stated that the analysis accompanying each exemption request demonstrates that an acceptable level of fire protection already exists at Surry Power Station and the licensee has achieved the underlying purpose of the requirements of the applicable sections of Appendix R. In addition, the licensee stated that if the exemptions are denied, it would be necessary to design and install modifications to provide additional fire detection and fire suppression systems, fire barriers, emergency lighting, and instrumentation. Overall, these changes would require a significant expenditure of engineering, construction, and operations resources, as well as associated capital costs, which are not necessary to achieve underlying purpose of the rule, and the modifications would not increase the overall level of protection for safe shutdown equipment.

The staff has reviewed the fire protection analysis for each of the exemptions requested by the licensee and concludes that the existing and proposed fire protection features at Surry Power Station provide a level of safety equivalent to the technical requirements of applicable sections of Appendix R. Therefore, the staff concludes that "special circumstances" exist for the licensee's requested exemptions in that application of the regulation in these particular circumstances is not necessary to achieve the underlying purposes of Appendix R to 10 CFR 50. See 10 CFR 50.12(a)(2)(ii). The detailed evaluation of each of these exemptions is provided in the staff's Safety Evaluation dated February 25, 1988.

IV.

Accordingly, the Commission has determined, pursuant to 10 CFR 50.12(a), that (1) the exemptions as described in Section III are authorized by law and will not present an undue risk to the public health and safety and are consistent with common defense and security, and (2) special circumstances are present for the exemptions in that application of the regulation in these particular circumstances is not necessary to achieve the underlying purposes of Appendix R to 10 CFR 50. Therefore, the Commission hereby grants the following exemptions from the requirements of Sections III.G, III.J, and III.L of Appendix R to 10 CFR 50:

1. Containment Incore Instrument Tunnels (Fire Areas 15 and 16) to the extent that the redundant excore neutron flux detector cables in these areas are not separated by a horizontal distance of more than 20 feet pursuant to the requirements of Section III.G.2.d.
2. Separation of Instrumentation Inside the Containments (Fire Areas 15 and 16) to the extent that safe shutdown cables and equipment separated by 20 feet or by radiant energy shields are not free of intervening combustibles pursuant to Section III.G.2.d.
3. Emergency Lighting in the Containments, Main Control Room, and Exterior Access Routes to the extent that 8 hour battery-powered emergency lighting is not provided pursuant to Section III.J.
4. Refueling Water Storage Tank to the extent that process monitoring is not capable of providing direct readings of processed variables necessary to perform and control required safe shutdown functions pursuant to Section III.L.2.d.

5. Redundant Circuits in a Manhole Adjacent to Fuel Oil Pumphouse Room 2 (Fire Area 18B) to the extent that cables of redundant trains are not separated by a fire barrier having a 3 hour fire resistance rating pursuant to Section III.G.2.a.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of these exemptions will have no significant impact on the environment (February 25, 1988, 53 FR 5659).

A copy of the Safety Evaluation dated February 25, 1988, related to this action is available for public inspection at the Commission's Public Document Room, 1717 H Street, NW, Washington, D.C., and at the Swen Library, College of William and Mary, Williamsburg, Virginia 23185. A copy may be obtained upon written request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Reactor Projects I/II.

These Exemptions are effective upon issuance.

Dated at Rockville, Maryland this 25th day of February, 1988.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE 2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATIVE TO APPENDIX R EXEMPTIONS REQUESTED FOR VIRGINIA ELECTRIC AND POWER COMPANY SURRY POWER STATION UNITS 1 AND 2 DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

By letter dated July 6, 1984, the Virginia Electric and Power Company (the licensee) submitted a report describing its compliance with Appendix R to 10 CFR 50. The submittal requested exemptions from Sections III.G, III.J and III.L of Appendix R to 10 CFR 50. Additional information was submitted by letters dated November 30, 1984, April 10, 1986, September 30, 1986 and October 16, 1987. The exemption requests identified in the submittals are the subject of this evaluation.

Section III.G.1 of Appendix R requires fire protection features to be provided for structures, systems, and components important to safe shutdown and capable of limiting fire damage so that:

a. One train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage; and

b. Systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) can be repaired within 72 hours.

Section III.G.2 of Appendix R, except as provided for in Paragraph III.G.3, requires that one train of cables and equipment, including associated nonsafety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, necessary to achieve and maintain safe shutdown be maintained free of fire damage by one of the following means:

a. Separation of cables and equipment and associated nonsafety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier.

b. Separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

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c. Enclosure of cables and equipment and associated nonsafety circuits of one redundant train in a fire barrier having a 1 hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

If the above conditions are not met, or where redundant trains of systems required for hot shutdown may be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems, Section III.G.3 requires that there be alternative or dedicated shutdown capability independent of cables, systems, or components in the fire area of concern. It also requires that fire detection and a fixed suppression system be installed in the fire area, zone, or room of concern.

Because it is not possible to predict the specific conditions under which fires may occur and propagate, design basis protective features rather than the design basis fire are specified in the rule. Plant-specific features may require protection different from the measures specified in Section III.G. In such a case, the licensee must demonstrate, by means of a detailed fire hazards analysis, that existing protection or existing protection in conjunction with proposed modifications will provide a level of safety equivalent to the technical requirements of Section III.G of Appendix R.

In summary, Section III.G is related to fire protection features for ensuring that one train of systems and associated circuits necessary to achieve and maintain safe shutdown are free of fire damage. Either fire protection configurations must meet the specific requirements of Section III.G or an alternative fire protection configuration must be justified by a fire hazards analysis. Generally, the staff will accept an alternative fire protection configuration if:

-- The alternative ensures that one train of equipment necessary to achieve hot shutdown from either the control room or emergency control station(s) is free of fire damage.

-- The alternative ensures that fire damage to at least one train of equipment necessary to achieve cold shutdown is limited so that it can be repaired within 72 hours (minor repairs using components stored on the site).

-- Fire-retardant coatings are not used as fire barriers.

-- Modifications required to meet Section III.G would not enhance fire protection safety levels above that provided by either existing or proposed alternatives.

-- Modifications required to meet Section III.G would be detrimental to overall facility safety.

2.0 AUXILIARY, FUEL, AND DECONTAMINATION BUILDINGS (FIRE AREA 17)

2.1 Exemption Requested

An exemption was requested from the requirements of Section III.G.3 to the extent that it requires fire detection and fixed automatic suppression systems be provided throughout the fire area, room, or zone for which an alternate shutdown capability has been provided.

2.2 Discussion

The licensee has stated in exemption request 1 that Fire Area 17 does not meet the requirements of Section III.G.3 because fire detection and fixed automatic suppression systems are not provided throughout the fire area.

Fire Area 17 includes Fire Zones 17-1a and 17-2a and consists of the auxiliary, fuel, and decontamination buildings. The buildings are located-side-by side in a north/south orientation, with the auxiliary building to the south, the decontamination building to the north, and the fuel building in the center. This fire area contains the six charging pumps, the component cooling water (CCW) pumps, the charging pump-cooling water pumps and associated cabling and valves for all of the pumps.

Fire Area 17 is bounded to the south by the service building and each units' cable vault/tunnel (Fire Areas 1 and 2), to the north by the plant exterior, to the east by the primary containment and the cable vault/tunnel for Unit 2 (Fire Areas 16 and 2, respectively), and to the west by the primary containment and the cable vault/tunnel for Unit 1 (Fire Areas 15 and 1, respectively). All barriers of adjacent fire areas are of 3 hour rated reinforced concrete construction, and electrical and piping penetrations are sealed with 3 hour fire rated silicone foam, except for penetrations to the containment.

The auxiliary building is a four-story structure consisting of elevations 2 feet, 0 inch; 13 feet, 6 inches; 27 feet, 6 inches; and 45 feet, 10 inches. The CCW pumps, charging pumps, and charging pump-cooling water pumps are located on the 2-foot, 0 inch elevation. The CCW pumps are located in the main open floor area of this elevation. Each charging pump is located in a separate cubicle accessed from the 13 foot, 0 inch elevation. Charging pump-cooling water pumps (two each for Units 1 and 2) are located outside the charging pump cubicles.

The fuel building section of Fire Area 17 is a two-story structure. The decontamination building is a three-story structure, consisting of the 6 foot, 10 inch; 22 foot, 0 inch; and 47 foot, 4 inch elevations.

An automatic fire detection system, which annunciates in the control room, is provided in Fire Area 17. Smoke detection is provided on each elevation of the auxiliary building, but it does not meet the criteria of full area coverage. Detectors are installed in all locations with significant amounts of combustibles and near safe shutdown components.

Each charging pump cubicle has one ceiling-mounted and one duct-mounted smoke detector. Two ceiling-mounted detectors are installed above each unit's charging pump-cooling water pumps, which also alarm in the control room.

The fuel building is provided with ceiling-mounted smoke detectors while the decontamination building is provided with duct-mounted smoke detectors.

Portable extinguishers and hose stations are provided throughout Fire Area 17 for manual fire fighting purposes.

2.2.1 Charging Pump System Configuration and Separation

The 2 foot, 0 inch and 13 foot, 0-inch elevations of Fire Area 17 are subdivided into Fire Zones 17-1a and 17-2a. Fire Zones 17-1b and 17-2b are similarly arranged on the 13 foot, 0 inch elevation.

The Unit 1 charging pump components are located within Fire Zones 17-1a and 17-1b and the Unit 2 charging pump components are located within Fire Zones 17-2a and 17-2b. Where there is less than 20 feet of horizontal separation between the components, an 18 inch-thick reinforced concrete wall extending from the floor to the ceiling on both elevations has been erected.

The Unit 1 charging pumps are located back-to-back against the Unit 2 charging pumps on the 2 foot, 0 inch elevation. Each charging pump is enclosed in a cubical, with 18 inch-thick concrete walls that extend up to the 2 foot, 0 inch elevation ceiling. The cubical walls extend up to the ceiling of the 13 foot, 0 inch elevation on three sides. The cubicles are open on the 13 foot, 0 inch elevation side facing the respective unit. Units 1 and 2 charging pump suction valves are located in separate charging pump cubicles separated by a heavy concrete barrier wall.

The charging pump power feeds for Units 1 and 2 exit their respective cubicles on the the 13 foot, 0 inch elevation and are routed to their respective cable vaults/tunnels. The minimum separation for Units 1 and 2 charging pump cables is more than 40 feet. Intervening combustibles in the form of cable trays that run perpendicular to the charging pump power feeds are fire stopped approximately 20 feet from the intersection. Therefore, a minimum of 20 feet of separation without intervening combustibles exists between Units 1 and 2 charging pump power feeds.

2.2.2 Component Cooling Water System

The CCW pumps are located side-by-side without 20 feet of separation. The licensee stated that the pumps are needed only for cold shutdown. A repair procedure exists to facilitate the replacement of two CCW pump motors and associated cables in case of a fire in this area. Two spare motors and associated cables are maintained on-site for this repair.

2.3 Evaluation

The lack of "area-wide" fire detection and suppression is a condition encompassed by the revised interpretations of Appendix R contained in Generic Letter (GL) 86-10. According to these interpretations, no exemption for this

condition is necessary. However, the staff considers the evaluation and justification for the exemption submitted by the licensee as constituting the fire hazards analysis required by the GL.

The staff's principal concern was that because of the absence of area-wide automatic suppression and detection systems, a fire of significant magnitude could develop and damage all CCW pumps, charging pumps, and/or associated cabling and valves.

However, the combustible loading in Fire Area 17 is low. An equivalent fire severity based on the ASTM E-119 time-temperature curve is less than 10 minutes for elevation 2 feet, 0 inch and less than 25 minutes on elevation 13 feet, 0 inch. The combustibles consist primarily of cable insulation and lube oil.

The six charging pumps are separated by heavy concrete walls that have an inherent fire rating that exceeds 3 hours. The power feeds for the charging pumps are separated by a minimum of 20 feet of horizontal separation. The fire stops installed in cable trays effectively reduce the potential of fire spread along trays.

In addition, smoke detectors are provided over each charging pump-cooling water pumps and within the charging pump cubicles. Smoke detectors are located near the cable trays at elevations 13 feet, 0 inch and 27 feet, 6 inches. Detectors are also located near the intervening combustibles between the charging pump power feeds.

Because of the presence of the detectors, a fire in the charging pump-cooling water pump area or a charging pump cubicle should be detected in its incipient stage. The detectors annunciate in the main control room and the fire brigade would be dispatched to extinguish the fire manually using hose lines or portable extinguishers provided.

It is concluded, therefore, that the installation of area-wide automatic fire suppression and detection systems would not significantly increase the level of fire protection for Fire Area 17.

2.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's analyses and justification for the absence of area-wide fire detection and suppression in Fire Area 17 are in conformance with the guidance issued in GL 86-10 and are, therefore, acceptable.

3.0 CONTAINMENT INCORE INSTRUMENT TUNNELS (FIRE AREAS 15 AND 16)

3.1 Exemption Requested

An exemption was requested from the requirements of Section III.G.2.d to the extent that it requires redundant cables and equipment to be separated by at least 20 feet with no intervening combustibles.

3.2 Discussion

The licensee has stated in exemption request 2 that Fire Areas 15 and 16 do not meet the requirements of Section III.G.2.d because less than 20 feet of separation exists between redundant excore neutron flux detector cables.

Fire Areas 15 and 16 are the primary containments for Units 1 and 2, respectively. Each area is a multi-level structure with floor elevations from (-) 27 feet, 7 inches to 47 feet, 4 inches. The incore instrumentation canal is located below elevation (-) 13 feet, 0 inch. The east, west, and north walls of each canal are 3 foot-thick reinforced concrete. The circular wall to the south of each canal is constructed of 4 feet, 6 inches reinforced concrete. The ceiling and floor of each canal are 2 foot-thick reinforced concrete.

Access to each canal is through a normally locked steel hatch located at elevation (-) 13 feet, 0 inch. There is a 20 foot vertical steel ladder within each hatchway that provides access to the canal floor.

The northern end of each canal contains no exposed combustibles. All cables in the canal are enclosed in rigid steel conduit. A sump pump is located in one corner of the canal.

The incore instrument tunnel for each unit contains cables for four channels of source range neutron flux indication. Two of the channels were originally provided as part of the nuclear instrumentation system and two channels were added in 1984-85. One of the new channels for each unit is used to provide neutron flux indication at the remote monitoring panel in the cable spreading room. The other three channels provide neutron flux indication in the control room.

Separation exists between the two new channels of neutron flux indication. The same separation exists between one of the new channels for each unit and the existing source range neutron flux cables.

The redundant channels for the new excore neutron flux detectors are routed in rigid steel conduit and are separated by 10 feet horizontally with no intervening combustibles in the canal. Upon exiting the canals, the redundant trains run in opposite directions until a minimum of 20 feet of separation free of intervening combustibles exists between the trains.

Near and within the canals, the fixed combustible loading is minimal. The potential for transient combustibles is limited since the access hatch is normally locked and access is controlled.

3.3 Evaluation

Fire Areas 15 and 16 at the incore instrument tunnels do not comply with the technical requirements of Section III.G.2.d of Appendix R because redundant cables and equipment, specifically excore neutron flux detector cables, are not separated by 20 feet horizontal distance with no intervening combustibles.

The combustible loading near the canals is minimal. The canals contain no fixed combustibles. The potential for transient combustibles to be introduced and stored in the canals is low.

A major factor that reduces the potential for damage to redundant source range neutron flux cables is that they are contained in rigid steel conduit.

The 10-foot separation between redundant cables, the minimal combustible loading, and the installation of cables in rigid conduit provide sufficient passive protection to ensure that one division of source range neutron flux cables would remain free of fire damage.

With the fire protection features as described above, reasonable assurance exists that a fire in the containment incore instrument tunnels (Fire Areas 15 and 16) will not prevent the plant from safely shutting down due to loss of redundant excore neutron flux detector cables.

3.4 Conclusion

Based on the above evaluation, the staff concludes that the existing fire protection features provide a level of fire safety equivalent to the technical requirements of Section III.G.2.d of Appendix R. Therefore, the exemption request from the requirement for 20 foot separation between redundant excore neutron flux detector cables should be granted.

4.0 MAIN STEAM VALVE HOUSES (FIRE AREAS 19 AND 20)

4.1 Exemption Requested

An exemption was requested from the requirements of Section III.G.3 to the extent that it requires automatic fire suppression systems throughout each of the identified fire areas.

4.2 Discussion

The licensee has stated in exemption request 4 that Fire Areas 19 and 20 do not meet the requirements of Section III.G.3 because automatic fire suppression systems are not installed throughout each area.

Fire Areas 19 and 20 are the main steam valve houses for Units 1 and 2, respectively. The areas contain the turbine-driven auxiliary feedwater (AFW) pump, two motor-driven AFW pumps, the steam generator power-operated relief valves (PORVs), the turbine-driven AFW steam supply valves and steam generator pressure indication. The steam supply valves for the turbine-driven AFW pump fail open and the PORVs fail closed. Each fire area is located in a separate structure south of and adjacent to the containment building (Fire Areas 15 and 16) and west of and adjacent to the cable vaults/tunnels (Fire Areas 1 and 2).

Fire Areas 19 and 20 are multi-level structures consisting of the 11 foot, 6 inch; 26 foot, 6 inch; 38 foot, 6 inch; 46 foot, 5 inch; and 57 foot, 0 inch elevations.

The fixed combustible loading in the areas is low, consisting primarily of cable insulation, grease and lubricating oil.

Ionization smoke detectors are provided in each of the fire areas at the upper elevation. The detectors alarm in the control room. In addition, portable fire extinguishers and plant exterior hose stations are available for manual fire fighting.

A fire in the main steam valve houses could damage all three AFW pumps and the steam supply valve to the turbine-driven AFW pump. Cross-connects located in the opposite units' main steam valve house enable the opposite unit to supply auxiliary feedwater to both units. Loss of power to the steam generator PORVs requires an alternate method of removing decay heat. The code safety valves will maintain the plant in hot standby until a manual valve lineup can be performed to release steam to atmosphere via the auxiliary steam system in the turbine building. Steam generator pressure can be monitored at the remote monitoring panel in the cable spreading room.

4.3 Evaluation

The lack of area-wide automatic fire suppression is a condition encompassed by the revised interpretations of Appendix R contained in GL 86-10. According to these interpretations, no exemption for this condition is necessary. However, the staff considers the evaluation and justification for the exemption submitted by the licensee as constituting the fire hazards analyses required by the GL.

The staff's principal concern was that because of the absence of area-wide automatic fire suppression systems, a fire of significant magnitude could develop. However, the combustible loading in the areas is low, consisting primarily of cable insulation, lubricating oil, and grease. If a fire were to occur, it is expected that it would develop slowly with initial low heat release and slow rise in room temperature.

Ionization smoke detectors are provided in each of the areas at the upper elevation. The alarms for the detectors are annunciated in the main control room. The fire brigade would be dispatched to extinguish the fire manually, using the hose lines or portable extinguishers provided.

With the low combustible loading, fire detection capability, availability of motor-operated cross-connect valves, availability of the auxiliary steam system, the remote monitoring panel, and the ability of the plant fire brigade to extinguish the fire promptly so that a manual valve lineup can be performed, it is concluded that the installation of an area-wide automatic fire suppression system would not significantly increase the level of fire protection for these areas.

4.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's analysis and justification for the absence of area-wide fire suppression in the subject areas are in conformance with the guidance issued in GL 86-10 and are, therefore, acceptable.

5.0 - 4-20 MA SIGNALS IN TWISTED PAIR INSTRUMENT CABLE
- 125-VDC CIRCUITS IN RIGID METAL CONDUIT

5.1 Exemption Requested

Exemptions were requested from the specific requirements of Section III.G.2 to the extent that it requires the protection of low current instrument circuits and 125-Vdc circuits that could prevent operation or cause maloperation due to hot shorts.

5.2 Discussion

The licensee has requested, in exemption requests 19 and 20, exemption from Appendix R for 4-20 mA signals carried by instrument cables, which are routed in raceway with other instrument cables, and for 125-Vdc circuits serving high/low pressure interfaces that are routed in dedicated rigid steel conduits. Areas in which one or more of the circuits are installed are the cable vaults and tunnels, main control room, containments, emergency switchgear rooms, and main steam valve houses.

The licensee states that the condition of all four conductors of two adjacent low current level instrument circuits, which are routed in raceway with other instrument cables fusing together in the correct polarity with low impedance, is not credible. In addition, a direct short (positive and negative conductors contact each other) or short-to-ground will cause a zero signal output.

The 125-Vdc circuits that are routed within a cable tray and provide motive power to high/low pressure boundaries that are susceptible to hot shorts must be protected in accordance with Section III.G.2 of Appendix R. The licensee has committed to route the circuits in dedicated steel conduit. In addition, there are procedures that require the circuits to be deenergized in the event of a fire.

The licensee has committed to provide a new isolation switch in the emergency switchgear room to ensure that the circuits can be deenergized from either the existing switch in the control room or from the emergency switchgear rooms.

5.3 Evaluation

Sections III.G.2 and III.L.7 of Appendix R define circuit failure modes as hot shorts, open circuits, and shorts to ground. For consideration of spurious actuations, all possible functional failure modes must be evaluated; e.g., the component could be energized or deenergized by one or more of the above failure modes.

Guidance concerning which failure mode must be considered in identifying circuits associated by spurious actuation is provided in GL 86-10 dated April 24, 1986. GL 86-10 states that for ungrounded dc circuits, if it can be shown that only two shorts of the proper polarity without grounding could cause spurious

operation, no further evaluation is necessary, except for circuits involving high/low pressure interfaces.

The licensee has routed circuits involving high/low pressure interfaces in dedicated rigid steel conduit. In addition, there are procedures that require the circuits to be deenergized in the event of a fire. The circuits can be deenergized from the main control room and the emergency switchgear rooms.

The likelihood of getting a hot short of the proper polarity without grounding of two independent dc circuits (one circuit within a dedicated conduit and one circuit from outside the conduit) is considered sufficiently low as not to require evaluation.

Based on the above guidance contained in GL 86-10, an exemption request for the above circuits is not required.

5.4 Conclusion

Based on the above evaluation, it is concluded that the 4-20 mA instrument cables and the 125-Vdc circuits identified in the licensee's submittals meet the guidance contained in GL 86-10. Therefore, the exemption request from protecting the circuits from hot shorts is not required.

6.0 SEPARATION OF INSTRUMENTATION INSIDE CONTAINMENT

6.1 Exemption Requested

An exemption was requested from the requirements of Section III.G.2.d to the extent that it requires redundant cables and equipment separated by 20 feet free of intervening combustibles or by radiant energy shields.

6.2 Discussion

The licensee has stated in exemption request 17 that primary and alternate trains of cabling for primary plant instrumentation inside the containment are separated by more than 20 feet or by radiant energy shields, but intervening combustibles exist in certain areas. The instrumentation of concern are the reactor coolant system (RCS) hot and cold leg temperatures, steam generator level, excore neutron flux monitoring, RCS pressure, and pressurizer level.

Fire Areas 15 and 16 are the primary containments for Units 1 and 2 respectively. Primary and alternate trains of instrumentation are routed through two different penetration areas within each containment. One electrical penetration area is into each unit's cable vault/tunnel area. A second electrical penetration area for each containment is provided into the fuel building. These two penetration areas are separated by more than 20 feet horizontally and by more than of 30 feet vertically for each unit.

Radiant energy shields have been installed between primary and alternate instrumentation or components located less than 20 feet apart. Fire rated conduit wraps have been provided where there is less than 20 feet of horizontal separation, regardless of the open vertical exposure. The wraps are provided until a distance of 20 feet of horizontal separation is achieved or until a barrier which is constructed of heavy concrete is encountered.

Intervening combustibles in the form of cables trays exist between primary and alternate trains of instrumentation separated more than 20 feet or by radiant energy shields. In order to mitigate the potential of fire spread along the trays, the licensee has installed vertical and horizontal fire stops where the cable trays constitute a potential intervening combustible between safe shutdown cable trays. The horizontal fire stops are 36 inch-long Marinite boards on the top and bottom of the tray, with 10 inches of silicone foam in between.

Cable tray covers have been installed on trays near the cable vaults/tunnels penetration areas. In addition, a cable tray bottom has been installed on the lowest horizontal cable tray.

Heat and smoke detectors which alarm in the control room are located in certain areas within the primary containment. Portable fire extinguishers are also located inside the containment. Dry standpipes are available for use by the fire brigade.

6.3 Evaluation

The fire protection for Fire Areas 15 and 16 does not comply with the technical requirements of Section III.G.2.d of Appendix R because intervening combustibles, specifically, cable in trays, exist between primary and alternate trains of cabling for primary plant instrumentation, which is separated by more than 20 feet.

The licensee has committed to provide fire stops between redundant instrumentation components or cabling to mitigate the consequences of intervening combustibles.

The combustible loading in the containment is limited, and limited access to the containment minimizes the transient combustibles which could be introduced. The location and design of the fire stops will inhibit fire propagation between redundant trains along the cable trays. With the fire protection features described above, there is reasonable assurance that a fire within the containment will not prevent the plant from safely shutting down due to loss of primary and alternate trains of identified instrumentation cabling resulting from fire propagation along intervening combustibles.

6.4 Conclusion

Based on the above evaluation, the staff concludes that the existing fire protection features combined with the proposed cable tray fire stops provide a level of fire protection equivalent to the technical requirements of Section III.G.2.d of Appendix R. Therefore, the exemption request from the specific requirements of Appendix R requiring no intervening combustibles should be granted.

7.0 AUXILIARY BUILDING, VENTILATION EQUIPMENT AREA (FIRE AREA 17)

7.1 Exemption Requested

An exemption was requested from the requirements of Section III.G.2.b to the extent that it requires automatic detection and suppression throughout Fire Area 17.

7.2 Discussion

The licensee has stated in exemption request 18 that Fire Area 17 for each unit does not meet the requirements of Section III.G.2.b because full area automatic detection and suppression are not provided.

Fire Area 17 consists of the auxiliary, fuel, and decontamination buildings for both Units 1 and 2. The buildings are located side by side in a north/south orientation, with the auxiliary building to the south, the decontamination building to the north, and the fuel building in the center. Additional details concerning Fire Area 17 are provided in Section 2.0.

Elevation 45 feet, 10 inches of the auxiliary building contains the normal auxiliary building exhaust fans, containment purge supply fans, miscellaneous supply and exhaust fans, and the ventilation system charcoal filters.

Auxiliary building ventilation is required to maintain a tenable environment for personnel and equipment during plant shutdown. Redundant fan systems are located on elevation 45 feet, 10 inches, separated by at least 20 feet horizontally, on opposite sides of charcoal filter units. The licensee has modified the power and the control cables of redundant fans so that redundant cables are separated by more than 20 feet of horizontal distance and routed in conduit.

The primary combustibles on elevation 45 feet, 10 inches are three charcoal filter units, two of which are located in the center of the floor between the two fans. The licensee stated that the charcoal filters will not expose either fan for the following reasons:

-- The filters are within metal enclosures and can be isolated by remotely operated redundant dampers.

-- The filter enclosure is equipped with both a safety-related ambient temperature monitoring system and a standard fire protection heat detection system, each of which annunciates in the control room.

-- There is a manually actuated low-pressure carbon dioxide fire suppression system in each charcoal filter enclosure. The systems can be actuated locally, near the filters, and remotely, from the control room. The third charcoal filter is protected with a water-spray deluge system.

-- An 18-inch-thick wall, 7 feet tall, surrounds each filter, and acts as a radiation shield and a partial fire barrier. The walls also act as partial height walls between the fans.

Any cable trays which would be considered intervening combustibles between the fans will be firestopped.

7.3 Evaluation

The lack of area-wide fire detection and suppression is a condition encompassed by the revised interpretations of Appendix R contained in GL 86-10. According to these interpretations, no exemptions for this condition is necessary. However, the staff considers the evaluation and justification for the exemptions submitted by the licensee as constituting the fire hazards analyses required by the GL.

The staff's principal concern was that because of the absence of area-wide automatic suppression and detection systems, a fire of significant magnitude could develop and damage both the normal and redundant auxiliary building ventilation fans. However, the combustible loading in Fire Area 17 is low, resulting in an equivalent fire severity of less than 20 minutes based on the ASTM E-119 time-temperature curve.

In addition, automatic fire detectors are installed on each elevation of the auxiliary building near cable trays and in each charging pump cubicle. Because of the presence of the detectors, a fire would be detected in its incipient stage. The alarms from the detectors are annunciated in the main control room. The fire brigade would be dispatched to extinguish the fire manually, using hose lines or portable extinguishers.

The primary combustibles on the 45 foot, 10 inch elevation are the charcoal filters. The two filters in the center are protected by a manual carbon dioxide fire suppression system that can be actuated either locally, near the filters, or remotely, from the control room. The third charcoal filter is protected by a water-spray deluge system. The charcoal filters are contained within a metal enclosure equipped with dampers, and are enclosed by a partial height wall that has a fire rating that exceeds 3 hours.

The staff finds that the installation of area-wide automatic fire suppression and detection systems would not significantly increase the level of fire protection for Fire Area 17.

7.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's analyses and justification for the absence of area-wide fire detection and suppression in the subject areas are in conformance with the guidance issued in GL 86-10 and are, therefore, acceptable.

8.0 - EMERGENCY LIGHTING IN THE CONTAINMENTS, CONTROL ROOM, AND EXTERIOR ACCESS ROUTES

8.1 Exemptions Requested

Exemptions were requested from the requirements of Section III.J to the extent that it requires all areas required for operation of safe shutdown equipment, and in access and egress routes thereto, to be provided with emergency lighting units with at least an 8-hour battery supply.

8.2 Discussion

The licensee has stated in exemption requests 14, 21, and 23 that the above areas do not meet the requirements of Section III.J of Appendix R because 8-hour battery-powered emergency lighting is not installed.

The control room emergency lighting units are diesel-powered as opposed to an 8-hour battery-powered supply. The licensee's basis for the use of diesel-backed emergency lighting in the control room includes the following:

1. The plant emergency diesel generators have a fuel capacity in excess of 8 hours.

2. Power feeds are routed such that no single fire outside the control room could affect both power supplies for the control room lights.

3. The lights are arranged in a configuration such that the lights from each units' diesel cover both sides of the control room.

4. An illumination test has been performed to verify the adequacy of the lighting level to perform required operations when powered from either diesel.

During the short transition from loss of offsite power to diesel generator power, battery-powered lights will illuminate the control room complex.

Operator access routes to various safe shutdown components required for an Appendix R safe shutdown may require travel outside the buildings. Lighting for the exterior routes is provided by station security lighting. The security lighting is powered by the station security diesel in the event of loss of off-site power.

Safe shutdown components are located within several buildings that require exterior access. These buildings are the main steam valve areas and the AFW rooms for Units 1 and 2.

The reactors' containments, Fire Areas 15 and 16 for Units 1 and 2 respectively, are reinforced concrete buildings which house components of the nuclear steam supply system.

The floor elevations in the containments are 27 feet, 7 inches; 13 feet, 0 inch; 3 feet, 6 inches; 18 feet, 4 inches; and 47 feet, 4 inches. Access to the containments is through a personnel access lock from the auxiliary building on elevation 47 feet, 4 inches. Access within the containments is via walkways that circle the containment between the outer containment concrete wall and the interior shield wall.

The licensee's procedures for an Appendix R shutdown in the event a fire will be based on establishing a letdown path. To ensure adequate pressure control of the RCS, the letdown path may be required to be established within approximately 4 hours.

If all the chemical and volume control systems (CVCS) normal and excess letdown paths are unavailable due to fire damage to the necessary cabling, the licensee's shutdown procedures will identify an alternative letdown path, which may be established by manually aligning the required valves. Some of the valves are located within the reactor buildings' containments and will require containment entry by operators to manipulate the valves. Establishing letdown is the only Appendix R "hot shutdown" scenario requiring access to the containments.

The reactor buildings' containments are not equipped with standard emergency 8-hour duration battery-powered lighting units. The installation of emergency lighting is not feasible due to the effects of the extreme temperature, humidity, and radiation conditions on the lighting units inside containment. In addition, frequent periodic testing of emergency lighting inside containment would not be consistent with ALARA criteria and could only be performed during outages, which would not provide a frequency that could assure proper operation.

Portable battery-powered lanterns are stored under administrative controlled conditions for use in emergencies, such as an Appendix R event. The lanterns are under the periodic test program to assure that the proper number is available and that they are all in working condition.

Fixed emergency lighting units (8-hour battery-powered units) will be installed in the auxiliary building to provide illumination up to the airlock into the containment.

8.3 Evaluation

The fire protection in the above areas does not comply with the technical requirements of Section III.J of Appendix R because 8 hour battery-powered emergency lighting is not installed in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

The staff had several concerns with the licensee's proposal to rely on portable lights. The first was that the flashlight would not be maintained in an operable condition for use in an emergency. However, the licensee committed to control access to and to maintain the flashlights so as to be assured of their availability and operability when needed.

The staff was also concerned that there might be obstructions or tripping hazards in the route of travel that might not be revealed with the beam of a flashlight. Based on past observations of the proposed route, no such conditions exist.

Finally, the staff was concerned that in proceeding across plant areas or in performing shutdown tasks, the operator would be required to use both hands, which would effectively prevent him from using the flashlight. However, the licensee has indicated that no such actions are necessary. On this basis, the staff considers the licensee's use of flashlights to be acceptable.

The staff also had several concerns with the licensee's proposal to rely upon security lighting. The first was that the same fire which resulted in the need to go to the areas covered by the security lighting would cause the loss of this capability. The security lighting is supplied power from the security diesel and is, therefore, not vulnerable to fire loss under the postulated fire scenario.

Another concern was that the level of illumination would be sufficient to provide the staff with reasonable assurance that the safe shutdown function could be achieved. The licensee conducted a walkdown of the yard areas where the alternative lighting configuration was provided. This walkdown confirmed that an adequate level of illumination had been provided.

The staff was also concerned that the security lighting would not be maintained. However, this lighting is inspected and maintained as part of the plant security requirements. The staff finds this acceptable.

8.4 Conclusion

Based on the above evaluation, the staff considers the licensee's alternate lighting configuration to be equivalent to that achieved by conformance with Appendix R to 10 CFR 50. Therefore, the licensee's request for exemption from the requirements of Section III.J. in the subject locations should be granted.

9.0 REFUELING WATER STORAGE TANK, DIRECT READINGS

9.1 Exemption Requested

An exemption was requested from the requirements of Section III.L.2.d to the extent that it requires that process monitoring to be capable of providing direct readings of process variables necessary to perform and control required safe shutdown functions.

9.2 Discussion

The licensee has stated in exemption request 22 that the level monitoring of the refueling water storage tank (RWST) does not meet the requirements of Section III.L.2.d because a fire occurring in any one of several fire areas such as the control room or the emergency switchgear room may result in the loss of RWST level indication.

An RWST is provided for each unit. The RWST provides makeup water to the RCS via the charging pumps for reactor coolant inventory and reactivity control. Level indication for the RWST is provided in the control room for normal operations. A fire in the control room and either units' emergency switchgear room or cable vault/tunnel could cause the loss of this indication. No redundant or alternate method is provided for obtaining either a direct or indirect level indication.

Plant Technical Specifications require that 387,100 gallons of water be available in the RWST of each unit operating. The licensee has performed an analysis and determined that less than 10 percent of the volume of the RWST is required to reach cold shutdown.

The two RWSTs are cross-connected so that the charging pumps for the two units take suction from a header fed by both tanks. The RWST cross-connect valves are air-operated, and fail open on loss of air.

There are administrative controls to ensure that if one unit is not operating, there will be sufficient volume in that unit's RWST to safely shut down the operating unit should the operating unit's charging pumps become disabled. This shutdown would be achieved using the charging pump discharge cross-connection.

9.3 Evaluation

The fire protection for the RWST does not comply with the technical requirements of Section III.L.2.d of Appendix R because a fire can damage RWST level indication and no alternate means of process monitoring is provided. Therefore, direct readings of the process variables necessary to perform and control required functions at the control room and the remote shutdown panel is not provided.

The amount of water taken from the RWST for RCS makeup during an Appendix R safe shutdown is less than 10 percent of the minimum RWST volume allowed by the licersee's Technical Specifications.

The RWSTs are cross-connected so that the total volume of both tanks is available, or a backup supply of one RWST if one RWST is out of service. Administrative controls are provided to assure that there is sufficient quantity of water available in the RWST of a unit that is not operating to supply the charging pumps for the operating unit if necessary.

There is sufficient margin of RWST volume to achieve an Appendix R safe shutdown.

9.4 Conclusion

Based on the above evaluation, the staff concludes that the existing RWST inventory combined with the administrative controls and the quantity of water available in the RWST of a unit not operating provide a level of fire protection equivalent to the requirements of Section III.L.2.d of Appendix R. Therefore, the exemption request from direct reading of process variables, specifically, RWST level, should be granted.

10.0 TURBINE BUILDINGS (FIRE AREA 31)

10.1 Exemption Requested

An exemption was requested from the requirements of Section III.G.2.b to the extent that it requires fire detection to be provided throughout fire area 31.

10.2 Discussion

The licensee has stated in exemption request 3 that Fire Area 31 does not meet the requirements of Section III.G.2.b because fire detection is not provided throughout the area.

Fire Area 31 is the turbine building. This building consists of three primary elevations: 9 feet, 6 inches (basement); 35 feet, 0 inches (mezzanine); and 58 feet, 6 inches (turbine deck). The service building is located north of the turbine building. The administration building is to the west, the condensate polishing building is to the east, and the south wall is an exterior wall facing the transformers.

There is an 8 inch-thick block wall that extends up from the floor of the 9 foot, 6 inch elevation to the ceiling of the 35 foot, 0 inch elevation. This wall separates the Unit 1 areas from the Unit 2 areas in the turbine building. There is a pipe tunnel that starts at the 9 foot, 6 inch elevation of the turbine building. The tunnel is the subject of exemption request 13, which is discussed in Section 14.2.6 of this SE. The 9 foot, 6 inch elevation houses the pumps and the lube oil components.

The turbine building contains the auxiliary steam system to the air ejectors, which are required for alternative safe shutdown if the PORVs are inoperable, and several main steam valves which are required for alternative safe shutdown if the main isolation valves are inoperable. The turbine building also contains manual isolation valves for the charging pump service water system. The valves are located in valve pits below elevation 9 feet, 6 inches in each unit's turbine building. The flow path for the charging pump service water system is such that either Unit 1 or 2 charging pump service water piping can supply water to the charging pump service water pumps for each unit.

The turbine building has a full area automatic sprinkler system on elevations 35 feet, 0 inch and 9 feet, 6 inches. Upon sprinkler system water flow, an alarm is transmitted to the control room. The major lube oil components have individual deluge systems actuated by heat detectors over the hazard. The detectors also annunciate in the control room upon system actuation.

There are several portable fire extinguishers and hose stations located in the turbine building. Also, there is a portable fire fighting foam cart available.

10.3 Evaluation

The lack of area-wide fire detection is a condition encompassed by the revised interpretations of Appendix R contained in GL 86-10. According to these interpretations, no exemptions for this condition is necessary. However, the staff considers the evaluation and justification for the exemption submitted by the licensee as constituting the fire hazards analysis required by the GL.

The staff was concerned that because an area-wide fire detection system was not installed, a fire of significant magnitude could develop and damage safe shutdown equipment.

However, elevations 35 feet, 0 inch and 9 feet, 6 inches of the turbine building are fully protected by automatic sprinklers. The major lube oil components in the turbine building have individual deluge systems actuated by heat detectors over the hazard. Water flow in a sprinkler system annunciates in the control room. The licensee has stated in their evaluation that, in the turbine building, flaming fires are more likely to occur than smoldering fires. They also stated that sprinklers have a capability to detect flaming fires which is comparable to that of fixed temperature heat detectors.

The licensee has demonstrated by this evaluation that the installed sprinkler systems and the arrangement of safe shutdown equipment in the turbine building provide a level of fire protection which would not be significantly increased by the installation of an area-wide automatic fire detection system.

10.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's analyses and justification for the absence of area-wide automatic fire detection in the subject area are in conformance with the guidance issued in GL 86-10 and are, therefore, acceptable.

11.0 MECHANICAL EQUIPMENT ROOM 3 (FIRE AREA 45)

11.1 Exemption Requested

The licensee requested an exemption from Section III.G.3 of Appendix R to the extent that it requires a fixed automatic fire suppression system to be installed throughout Fire Area 45.

11.2 Discussion

The licensee has stated in exemption request 5 that Fire Area 45 for each unit does not meet the requirements of Section III.G.3 because full area automatic fire suppression is not provided.

Fire Area 45 consists of mechanical equipment room 3 located in the service building basement at elevation 9 feet, 6 inches. The Unit 2 emergency switchgear room borders on the north and west and is separated from Fire Area 45 by an 18 inch-thick reinforced concrete wall. The south wall is a 24 inch-thick reinforced concrete subterranean exterior wall. The floor is of 6 inch-thick concrete on grade and the ceiling is of 6-inch-thick concrete slab.

Fire Area 45 has an area of approximately 900 square feet. It is entered by a 3 hour rated class A fire door from the Unit 2 emergency switchgear room. The room has several ventilation openings protected by 3 hour rated dampers. Cable penetrations through the walls are sealed with 3 hour rated fire stop material. Administrative controls provide for periodic observation of the penetration seals.

Fire Area 45 contains dry air bottles for control room emergency pressurization, as well as for the chiller units and related pumps, piping, and cabling. Most important are the charging pumps, service water pumps, and the safe shutdown-related cabling passing through the area.

A 24 inch-wide flood barrier is located just inside the door. It is designed to protect the emergency switchgear room from a pipe or pump failure in Fire Area 45.

Two sets of smoke detectors are provided in Fire Area 45. One set is part of the original fire alarm system which annunciates in the control room. A second set of detectors were installed as part of a charging pump-service water pump redundancy project. The new detectors are designed to operate the motor-operated valves and to allow the redundant pumps to operate in the event of a fire. These detectors annunciate in the control room, but not on the main fire alarm panel.

There are fire extinguishers in the area and hose stations are located in the turbine building at the door to the emergency switchgear room.

Fire Area 45 contains two charging pumps, service water pumps, and associated

power and control cables. Also in this fire area are the power and control cables for the three emergency diesel generators. However, the power and control cables for diesel generator 1 have been relocated to a separate fire area. Power and control cables for Unit 2 motor-driven AFW pumps are located in this area. However, the turbine-driven AFW pump would be available for safe shutdown of Unit 2.

The fixed combustible loading in this area is low to moderate, consisting of cable insulation and a small quantity of lube oil for the pumps.

A fire in Fire Area 45 has the potential to damage the pumps and cables for the redundant charging pump-service water pumps. Alternative shutdown capability is provided by using charging pump-service water pumps located in a separate fire area.

11.3 Evaluation

The lack of area-wide fire suppression is a condition encompassed by the revised interpretations of Appendix R contained in GL 86-10. According to these interpretations, no exemption for this condition is necessary. However, the staff considers the evaluation and justification for the exemption submitted by the licensee as constituting the fire hazards analysis required by the GL.

The staff's principal concern was that if a fire occurred, the lack of an area-wide fire suppression system could result in significant fire propagation and duration and adversely affect the post-fire safe shutdown capability. However, the combustible loading in this area is low to moderate, consisting primarily of cable insulation and lube oil. If a fire were to occur, it is expected to develop slowly.

Smoke detectors are provided in the area. The alarm for these detectors are annunciated in the main control room. The fire brigade will be dispatched and will extinguish the fire manually, using the hose lines or portable extinguishers provided.

Alternative shutdown capability is provided by using charging pump-service water pumps located in a separate fire area.

Until the fire was extinguished by the fire brigade, the low to moderate combustible loading, the fire detection, and the availability of alternative shutdown capability in a separate fire area will provide sufficient protection to assure that a fire in Fire Area 45 will not prevent a plant safe shutdown.

11.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's analyses and justification for the absence of area-wide automatic fire suppression in the subject area are in conformance with the guidance issued in GL 86-10 and are, therefore, acceptable.

12.0. REDUNDANT CIRCUITS IN A MANHOLE

12.1 Exemption Requested

An exemption was requested from the specific requirements of Section III.G.2.a to the extent that it requires the separation of cables, equipment, and associated nonsafety circuits of redundant trains by a fire barrier having a 3 hour fire resistance rating.

12.2 Discussion

The licensee has stated in exemption request 25 that the power feeds to the six emergency diesel generator fuel oil transfer pumps (two pumps for each of three diesel generators) are routed through the same manhole and that the power feeds do not meet the requirements of Section III.G.2.a because the feeds for redundant pumps are not separated by a 3 hour fire barrier.

12.2.1 Area Description

The manhole is located in the north yard area adjacent to the south wall of the fuel oil pump house, room 2 (Fire Area 18B). It is approximately 6 feet by 5 feet, 4 inches-wide (32 square feet) and 14 feet deep (from the top of the manhole to the top of the floor). The walls, floor, and ceiling are a minimum of 24 inches of reinforced concrete. The manhole cover is approximately 1 inch-thick steel plate.

The junction boxes (JBs) through which the power feeds pass are embedded in concrete on all sides, except the one facing the inside of the manhole. The JBs are of galvanized steel. Two boxes are on the west wall and the other two are on the east wall.

The fuel oil pump house located to the north of the manhole is divided into two separate rooms, which are different fire areas (18A and 18B). There is a 3 hour rated barrier between the manhole and the fuel pump house rooms.

The north yard area contains the structures associated with the primary side of the plant (containment structures, fuel building, safeguards, etc.). This area is part of the restricted controlled areas (RCA), which results in limited access.

There are no detection or suppression systems within the manhole. However, yard hydrants and hose houses are located nearby.

12.2.2 Configuration of the Manhole

The power feeds for the fuel oil transfer pumps are routed via buried conduit into junction boxes within the manhole. A fire in the manhole concurrent with the loss of off-site power has the potential of affecting the emergency power system by failing to provide additional fuel after the 3 hour supply in the diesel generator day tank is exhausted.

The JBs are buried in concrete such that only one face is exposed to the inside of the manhole. In addition, the JBs are on opposite sides of the manhole, separated by 6 feet with no intervening combustibles. To upgrade the separation between the JBs, fire-rated silicone foam has been used to completely fill them. This arrangement serves several purposes:

1. The foam has sealed the conduit penetrations into the JBs, preventing smoke and heat from entering.

2. A fire inside a JB must burn through the foam, then through a galvanized steel plate to be able to expose the other JBs, which are 6 feet away.

3. A fire entering the manhole must cause both of the galvanized steel-faced plates to fail, and then must burn through several inches of silicone RTV foam before a cable is exposed.

The manhole construction is as follows:

1. The walls, floor, and ceiling are of 24 inch-thick reinforced concrete with no openings to other fire areas, except via the JBs and conduit which, as noted above, are sealed.

2. The roof of the manhole is approximately 8 inches above grade. Due to the large area of the north yard and the presence of storm drains, it is inconceivable that there could be a spill of sufficient volume to overflow the 8-inch lip.

3. The access hatch is constructed of 1 inch-thick steel plate. The plate fits securely into a recessed opening.

4. The manhole is approximately 14 feet deep and the junction boxes are about 4 feet above the floor. The ceiling height will reduce exposure to the JBs.

A fire in the manhole or nearby would be detected by the security officer in the guard tower located nearby. The fire brigade could quickly extinguish fire in the manhole or nearby, either with a portable extinguisher or with a hose stream from a nearby hydrant and hose house.

12.2.3 Outside Exposures

Due to the lack of combustibles within the manhole, the only credible source of exposure to the power feeds is from a fire originating outside of the manhole. The potential sources are listed below along with mitigating factors.

1. Fuel Oil Pump Houses

   The fuel oil pumphouses are located adjacent to the manhole on the north side. The barrier between the pump houses and the manhole is 3 hour rated, and the conduits have been effectively sealed where they enter the JBS. In addition, both room A and B of the pump houses have separate high pressure CO_2 total flooding fire suppression systems actuated by heat detectors. The system annunciates in the control room. Therefore, the fuel oil pump house does not pose an exposure threat to the manhole.

2. Above Ground Fuel Oil Storage Tank.

There is a 210,000-gallon fuel oil storage tank located approximately 50 feet (on center) from the manhole. There is a dike around the tank designed to hole the volume of the tank. The station fire brigade is equipped with foam carts and foam nozzles for manual fire fighting operations. The manhole roof is 8 inches above grade. If the dike failed, there is insufficient volume in the tank to flow into the manhole. (Note: The tank trucks that supply the fuel oil tank off load outside the security fence over 500 feet from the manhole).

3. Transient Flammable Liquids.

There are few sources of flammable and combustible liquids in the north yard. The largest source is the fuel in vehicles. Since this area is part of the RCA, there are health physics controls on vehicles brought into the areas; therefore, only a limited number enter the area. The same restrictions apply to material carried by hand into the RCA. As stated above, the 8 inch difference between the top of the manhole and grade will prevent spills from entering the manhole.

Therefore, the 24 inch-thick concrete construction, the solid steel access hatch plate, and the 8 inch difference between grade level and the top of the manhole will prevent outside exposures from entering the manhole.

12.3 Evaluation

The fire protection for the manhole does not comply with the technical requirements of Section III.G.2.a of Appendix R because power feeds to redundant fuel oil transfer pumps are not separated by a 3-hour fire rated barrier.

The cables are separated by JBs located on opposite sides of the manhole, approximately 6 feet apart with no intervening combustibles. The cables are arranged such that one EDG will be available if one set of JBs were lost.

The JBs are embedded in the wall such that only one face is exposed.

The JBs have been filled with silicone foam to seal the conduits entering the box and to prevent the fire from spreading out of the JB.

The potential exposure hazards located nearby are mitigated by either dikes or fire suppression systems.

The arrangement of the JBs in the manhole, the separation between the JBs, and the low combustible loading in the manhole provide reasonable assurance that at least one train of fuel oil transfer pump power cables would remain free of fire damage.

12.4 Conclusion

Based on the above evaluation, the staff concludes that the existing fire protection features provide a level of fire protection equivalent to the technical requirements of Section III.G.2.a of Appendix R. Therefore, the exemption request for the lack of a 3 hour fire-rated barrier between the power feeds in the manhole should be granted.

13.0 FIRE AREA BOUNDARIES

13.1 Exemptions Requested

The licensee requested approval for a number of exemptions from Section III.G.2 of Appendix R to the extent that it requires separation of redundant safe shutdown systems by 3 hour fire-rated barriers. The conditions encompassed by these exemptions exist within the walls and floor/ceiling assemblies which constitute fire area boundaries. In the interpretations of Appendix R contained in GL 86-10, the staff indicated that no exemptions were necessary for non-fire-rated features in fire area boundaries. However, a fire hazards analysis was required for each condition which could either be submitted to the staff for review or kept on file for future audit. The staff considers the exemption requests as constituting the fire hazards analyses.

13.2 Discussion

13.2.1 Emergency Switchgear Room Fire Door Frames, Fire Area 4

The licensee has stated in exemption request 7 that one door assembly (fire door 21) in the emergency switchgear fire area boundary at elevation 9 feet, 6 inches is not fire rated. The door is located between the emergency switchgear room (Fire Area 4) and the turbine building (Fire Area 31).

Fire Door 21 is a double door with an astragal between the leaves. The door serves as the primary access from the turbine building and Units 1 and 2 emergency switchgear rooms. The door is equipped with a security access control card reader. The door leaves are 3 hour rated, UL labeled, Class A fire doors. The licensee has determined that this fire door assembly also consists of the following components:

- Nonlabeled steel channel frame in a reinforced concrete wall
- Nonlabeled steel transom above the door
- Conduit into the frame (astragal).

The emergency switchgear rooms are protected by smoke detectors which annunciate in the main control room. In addition, a total flooding Halon fire suppression system has been installed.

The turbine building, elevation 9 feet, 6 inches has an automatic sprinkler system installed throughout the area. Sprinklers are also installed throughout elevation 35 feet, 0 inch. There are several fire extinguishers located throughout both areas. Hose stations are located in or near both areas.

The licensee has performed an analysis evaluating the capability of the door to perform in the fire area boundaries based on the installed fire protection systems, combustible quantity and configuration, and the comparison of existing door assemblies with laboratory standards.

14.2.2 Fire Doors, Frames Not Fire Rated (Various Fire Areas)

The licensee has stated in exemption request 6 that several door assemblies in fire area boundary walls have frames which do not have a label from a recognized testing laboratory.

These frames consist of steel channels that are an integral part of a reinforced concrete wall. The licensee has performed an analysis which shows that the frames are equivalent to labeled frames due to their construction. Additionally, the combustible quantity and configurations and fire protection systems on each side of the door was considered.

The subject doors are as follows:

-	Doors 14 and 15	Doors from the control room complex (Fire Area 5) to the turbine building (Fire Area 31)
-	Doors 37, 39, and 41	Doors from the emergency diesel generator rooms (Fire Areas 6, 7, and 8) to the turbine building walkway (Fire Area 31)
-	Doors 25, 26 -	Doors from the Unit 1 emergency switchgear room (Fire Area 3) to the Unit 1 cable vault/tunnel (Fire Area 1)
-	Door 27 -	Door from the Unit 2 emergency switchgear room (Fire Area 4) to the Unit 2 cable vault/tunnel (Fire Area 2)
-	Door 24 A -	Door from the Unit 1 cable vault/tunnel to the auxiliary building (Fire Area 17)
-	Door 27 B -	Door from the Unit 2 cable vault/tunnel to the auxiliary building
-	Door 23 -	Door from battery room 2B (Fire Area 12) to the turbine building
-	Door 12 -	Door from the Unit 2 cable spreading room (Fire Area 31) to the control room complex rear stairwell
-	Door 51 -	Door from the technical support center battery room (Fire Area 55) to the turbine building
-	Door 52 -	Door from the technical support center HVAC room to the turbine building

All of the above areas are equipped with heat detectors and/or smoke detectors. Units 1 and 2 cable vaults/tunnels and cable spreading rooms are equipped with total flooding CO_2 fire suppression systems activated by heat detectors. The emergency switchgear rooms are equipped with a manually actuated Halon system. A manually activated total flooding CO_2 system is located in the three emergency

diesel generator rooms. A manually actuated deluge system is located at the top of the cable vault and a manually actuated sprinkler system is located in the cable tunnel. There are smoke detectors in the cable vaults/tunnels and cable spreading room areas to provide early detection. Sprinkler systems are installed throughout the lower two elevators of the turbine building. In addition, the lube oil hazards in the turbine building, elevation 9 feet, 6 inches, are protected by automatic deluge systems.

The control room, battery room 2B, technical support center battery room and HVAC room, and the auxiliary building are equipped with smoke detectors. In addition, the cable tunnel has a backup deluge system and a closed-head sprinkler system that are manually activated.

Fire extinguishers are located throughout all the areas and hose stations are located nearby.

13.2.3 Fire Doors, Conduits in Door Frames (Various Fire Areas)

The licensee has stated in exemption requests 8, 9 and 10 that a several door assemblies in fire boundary walls have conduits penetrating into the door frame. The conduits carry cable for security devices such as card readers or door monitoring. The conduit arrangement has not been tested for a 3-hour fire rating.

The fire doors involved include:

-	Door 20	Unit 2 emergency switchgear room (ESGR) to the control room stairwell.
-	Door 23	Unit 2 battery room 2B (Fire Area 12) to the turbine building (Fire Area 31)
-	Doors 37, 39 and 41	Unit 1 emergency diesel generator rooms (Fire Areas 6, 7, and 8) to the turbine building (Fire Area 31)

Detection and/or suppression is provided in all areas adjacent to the above doors. The conduits only penetrate one side of the frame and where the conduit and frame meet, all connections are tight.

The licensee has evaluated the affected fire door assemblies and determined that they provide an adequate margin of fire resistance considering the fire loading and fire protection on both sides of each of the assemblies.

13.2.4 Control Room Stairwell/Emergency Switchgear Room Wall, Fire Barrier Rating (Fire Area 5)

The licensee has stated in Exemption Request 11 that the stairwell wall between the control room complex (Fire Area 5) and the Unit 2 emergency switchgear room (Fire Area 4) is not fire rated for 3 hours.

The stairwell between the control room complex and the Unit 2 emergency switchgear room is considered part of the control room complex fire area (Fire Area 5).

The wall between the stairwell and the Unit 2 emergency switchgear room (ESGR) is constructed of 8 inch-thick masonry blocks. The licensee has performed an analysis evaluating the capability of the wall to perform in this fire area boundary based on the installed fire protection systems and adjoining spaces, the combustible loading configuration within the areas, and comparison with masonry walls of known fire resistance rating. The evaluation concluded that the 8 inch-thick masonry wall provides an adequate margin of fire resistance based on the NRC staff guidance.

13.2.5 Cable Vaults/Tunnels and Auxiliary Buildings' Wall, Fire Barrier Rating (Fire Areas 1 and 2)

The licensee has stated in exemption requests 12 and 16 that there is an 8 inch-thick masonry wall separating Units 1 and 2 cable vault/tunnels (Fire Areas 1 and 2) from each other that is not a 3-hour fire rated wall, and that there are an 8 inch-thick masonry walls separating Fire Areas 1 and 2 from the auxiliary building (Fire Area 17) at elevation 13 feet that are not 3 hour fire-rated walls.

The licensee has stated that the subject walls are rated for a minimum of 2 hours. In addition, the cable vaults and tunnels and the auxiliary building are equipped with smoke detectors which will annunciate alarm to the control room.

The cable vault/tunnel areas are equipped with automatic total flooding CO_2 fire suppression systems and manual sprinkler systems.

The licensee concluded that the 8 inch-thick masonry wall combined with the fire protection features described above provide an adequate margin of fire resistance based on the NRC staff guidance.

13.2.6 Auxiliary Building/Turbine Building Pipe Tunnel - Lack of Fire Barrier Fire Area 17

The licensee has stated in exemption request 13 that a pipe tunnel is located below the ground floor of the service building and provides a routing from the turbine building (Fire Area 31) to the auxiliary building (Fire Area 17) for various pipes. A rated barrier or seal does not exist at either end of the tunnel.

The tunnel has a low combustible loading in the form of pipe insulation on chilled water lines. The tunnel opens vertically in the turbine building at the floor level. This elevation of the turbine building is equipped with an area-wide automatic sprinkler system and deluge systems protect major lube oil components.

The combustible loading in the auxiliary building is low to moderate. The 2 foot, 0 inch elevation where the tunnel exits into the auxiliary building contains few cables and only small amounts of lube oil in pumps. The area near the tunnel in the auxiliary building is also protected by automatic sprinklers. Smoke detectors exist on the auxiliary building side of the pipe tunnel.

There is a 2 foot-wide dike around the turbine building tunnel opening which prevents flammable liquids from entering the tunnel.

13.2.7 Conduit Passing Through Rated Fire Barriers - Lack of Internal Seals

The licensee has stated in exemption request 24 that several conduit penetrations through 3 hour fire barriers between fire areas containing redundant safe shutdown components are not sealed internally with a fire stop material providing a penetration seal equivalent to the rating of the fire barrier.

GL 86-10 provides guidance on conduit and cable tray penetrations through fire barriers. This guidance states that openings through fire barriers which separate fire areas should be sealed or closed to provide a fire resistance rating at least equal to the barrier.

Openings inside conduits larger than 4 inches should be sealed at the barrier penetration. Openings inside conduits 4 inches or less in diameter should be sealed at the fire barrier unless the conduit extends at least 5 feet on each side of the barrier and is sealed at both ends or at the barrier with noncombustible material to prevent the passage of smoke and hot gases.

As an alternative to the above guidance, the licensee has proposed the following configurations for the internal sealing of conduit penetrations. The following list of criteria are an acceptable deviation from our guidelines.

1. Conduits are sealed internally at the fire barrier to the rating of the fire barrier.

2. The conduits are sealed on at least one side of the fire barrier and both areas have fire detection near the penetration.

3. When the conduits penetrate a fire barrier and are unsealed, fire detection is installed in the vicinity of the conduit penetration on both sides of the barrier, and the conduits terminate into ventless enclosures on at least one side of the barrier, or

4. Where the conduits penetrate a fire barrier, the combustible loading has an equivalent fire severity of 10 minutes or less on one side of the fire barrier and has fire detection near the barrier on the other side. In addition, the conduit terminates into ventless enclosures on at least one side of the barrier.

13.3 <u>Evaluation</u>

The staff was concerned that a fire in any of these areas would penetrate the subject fire barriers resulting in loss of safe shutdown capability.

The existing configurations provide adequate passive fire protection, so that in event of fire, the barriers will not be breached. Because of the fire protection features provided, it is not expected that fire of significant magnitude or duration to occur in any of the fire areas. If a fire does occur, it would be detected by the installed detectors and extinguished by the plant fire brigade or automatic suppression systems before spreading to another fire area. The staff concurs with the licensee's analysis of the above fire area boundaries demonstrates the capability of the fire barriers to serve as fire area boundaries.

13.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's analyses and justification for non-3-hour-rated features in fire area boundary construction conform with the guidance issued in GL 86-10 and are, therefore, acceptable.

14.0 Withdrawn Exemption Request

In Exemption Request 15 entitled "Establishing Letdown - Using Non-Shift Personnel" the licensee requested an exemption from the specific requirements of Section IV.L.4 to the extent that it requires the number of non-shift personnel required to operate hot shutdown equipment and systems to be on site at all times.

Based on the results of further study and evaluation performed by the licensee, the licensee determined that sufficient time and personnel exist, after stable hot shutdown is reached and the postulated fire is extinguished, for on-shift personnel to initiate letdown by valve lineups and other related activities if non-shift operations personnel are not available. This is based on the evaluation that letdown will not be necessary for at least 10 hours after a postulated fire discovery and unit trip. Therefore, by letter dated October 16, 1987, the license decided to withdraw the above request for exemption.

15.0 SUMMARY

Based on the evaluation, it is found that the level of fire safety in the areas listed below is equivalent to that achieved by compliance with the technical requirements of Section III.G of Appendix R and, therefore, the licensee's request for exemption in the following areas should be granted:

1.0 Containment Incore Instrument Tunnels, Fire Areas 15 and 16.

Lack of 20 feet of separation between redundant excore neutron flux detector cables. See Section 3.0 for additional information.

2.0 Separation of Instrumentation Containment.

Redundant cables and equipment separated by 20 feet or by radiant energy shields with intervening combustibles. See Section 6.0 for additional information.

3.0 Redundant Circuits in a Manhole Less than a 3-hour Rated Separation Barrier.

Lack of 3-hour fire barrier separating redundant safe shutdown equipment. See Section 12.0 for additional information.

Based on the evaluation, it is found that the level of fire safety in the areas listed below is equivalent to that achieved by compliance with the technical requirements of Section III.J of Appendix R and, therefore, the licensee's request for exemption in these areas should be granted.

1. Emergency Lighting in the Control Room
   Emergency Lighting for Exterior Access Routes
   Emergency Lighting in the Containment

   Lack of emergency lighting units with at least an 8-hour battery supply in all areas needed for operation of safe shutdown equipment and access and egress routes thereto. See Section 8.0 for additional information.

Based on the evaluation, it is found that the level of fire safety in the area listed below is equivalent to that achieved by compliance with technical requirements of Section III.L of Appendix R and, therefore, the licensee's request for exemption in this area should be granted:

1. Refueling Water Storage Tank.

   Lack of direct readings of process monitoring variables necessary to perform and control required functions. See Section 9.0 for additional information.

The following conditions conform with the guidance issued in GL 86-10. No exemptions are, therefore, necessary.

1. Emergency Switchgear Room Fire Door Frames (Fire Area 4)

2. Fire Doors, Frames Not Fire Rated (Various Fire Areas)

3. Fire Doors, Conduit in Door Frames (Various Fire Areas)

4. Control Room Stairwell/Emergency Switchgear Room Wall (Fire Area 5)

5. Cable Vaults/Tunnels and Fire Barrier Rating Auxiliary Buildings' Fire Wall (Fire Areas 1 and 2)

6. Auxiliary/Turbine Buildings' Pipe Tunnel Lack of Fire Barrier (Fire Area 17)

7. Conduit Passing through Rated Fire Barriers (Lack of Internal Seals) - Various Fire Areas

8. Lack of area-wide fire detection and suppression systems (Various Fire Areas)

9. Lack of protection of low current instrument circuits and 125-V dc circuits (Various Fire Areas)

Dated: February 25, 1988

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