Docket

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

October 26, 1988

Docket No. 50-313

Mr. T. Gene Campbell
Vice President, Nuclear
Operations
Arkansas Power and Light Company
Post Office Box 551
Little Rock, Arkansas 72203

Dear Mr. Campbell:

SUBJECT: EXEMPTIONS FROM THE TECHNICAL REQUIREMENTS OF APPENDIX R TO 10 CFR PART 50 - ARKANSAS NUCLEAR ONE, UNIT 1 (TAC NO. 55669)

By letters dated August 15, 1984 and August 30, 1985, Arkansas Power and Light Company (AP&L) requested certain exemptions from the technical requirements of Sections III.G, III.J, and III.O of Appendix R to 10 CFR Part 50. Supplemental information was provided in AP&L letters dated October 20, 1986, April 22, and June 24, 1987, and April 25, 1988.

We have completed our review. Based on our evaluation of the AP&L submittals, we conclude that AP&L's proposed fire protection configuration provides an equivalent level of safety to that achieved by compliance with Appendix R. Therefore, the exemption requests as described in the enclosed Exemption are granted.

A copy of the "Environmental Assessment and Finding of No Significant Impact" was sent to you by letter dated June 9, 1988, and published in the Federal Register on July 18, 1988 (53 FR 27091).

In your letters of April 22 and June 24, 1987, you stated that Appendix R modifications for the emergency feedwater pump room would be accomplished by the end of the eighth refueling outage (1R8). We view these as schedule commitments. Any changes to these commitments should be requested from and approved by this office.

A copy of the Exemption is being filed with the Office of the Federal Register.

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In addition to the above, we have determined that AP&L's fire hazrds analysis of certain non-fire-rated features in fire area boundaries conforms with the guidance issued in Generic Letter 86-10. Therefore, an exemption for these conditions, as described in the above-referenced generic letter, is not necessary.

Our Safety Evaluation is also enclosed.

Sincerely,

/s/

Jose A. Calvo, Director
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosures:
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Our Safety Evaluation is also enclosed.

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Jose A. Calvo, Director
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosures:
As stated

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
ARKANSAS POWER & LIGHT COMPANY	)	Docket No. 50-313
(Arkansas Nuclear One, Unit 1)	)	

EXEMPTION

I.

Arkansas Power & Light Company (AP&L or the licensee) is the holder of Facility Operating License No. DPR-51 which authorizes the operation of Arkansas Nuclear One, Unit 1 (the facility) at a steady state power level not in excess of 2568 megawatts thermal. This license provides, among other things, that the facility is subject to all rules, regulations, and Orders of the Nuclear Regulatory Commission (the Commission or the staff) now or hereafter in effect. The facility is a pressurized water reactor (PWR) located at the licensee's site in Pope County, Arkansas.

II.

The 10 CFR 50.48, "Fire Protection," and Appendix R to 10 CFR Part 50, "Fire Protection Program for Nuclear Facilities Operating Prior to January 1, 1979" set forth certain fire protection features required to satisfy the General Design Criterion related to fire protection (Criterion 3, Appendix A to 10 CFR Part 50).

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Section III.G of Appendix R requires fire protection for equipment important to post-fire shutdown. Such fire protection is achieved by various combinations of fire barriers, fire suppression systems, fire detectors, and separation of safety trains (III.G.2) or alternate post-fire shutdown equipment free of the fire area (III.G.3). The objective of this protection is to assure that one train of equipment needed for hot shutdown would be undamaged by fire, and that systems needed for cold shutdown could be repaired within 72 hours (III.G.1).

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

Section III.O of Appendix R requires that facilities have a reactor coolant pump oil collection system if the containment is not inerted during normal operation. This system must be so designed, engineered, and installed that failure during normal or design basis accident conditions will not lead to fire, and that there is reasonable assurance that the system will withstand the Safe Shutdown Earthquake. Additionally the system must drain to a vented closed container that can hold the entire reactor coolant pump lube oil system inventory.

III.

By letters dated August 15, 1984 and August 30, 1985, the licensee provided details of their fire protection program and requested approval of a number of exemptions from the technical requirements of Sections III.G, III.J, and III.O of Appendix R to 10 CFR Part 50. Supplemental information was provided in AP&L

letters dated October 20, 1986, April 22 and June 24, 1987, and April 25, 1988. A description of the exemptions requested and a summary of the Commission's evaluation follow.

Exemption Requested

The licensee requested an exemption from Section III.G.2.b due to a lack of 20 feet of separation free of intervening combustible materials between redundant shutdown-related systems in the diesel generator room exhaust fan outlets area (Fire Area B, Zones 1-E and 2-E).

The staff's principle concern was that because of the absence of at least 20 feet of separation between the exhaust fan outlets, a pathway exists which could allow fire to spread and damage the redundant systems. Also, the lack of fixed suppression systems and fire detectors throughout this fire area could permit a fire to spread and result in the loss of safe shutdown capability. However, because of the light combustible loading in these fire zones and the absence of intervening combustibles between the redundant safe shutdown systems, it is not expected that a fire of significant duration or magnitude will occur. Additionally, with the licensee's commitment to install 3-hour rated fire doors between redundant trains of equipment completed, the possibility of a single fire in one of these fire zones damaging redundant equipment is very unlikely, despite the horizontal separation distance of less than 20 feet between redundant trains. The staff finds that there is reasonable assurance that a fire in these fire zones will not result in the loss of safe shutdown capability. On this basis the staff concludes that the licensee's alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.b.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the low fire loading, the absence of intervening combustibles, and the installation of the 3-hour rated fire doors between redundant trains, minimize the possibility of a fire in one train spreading and causing damage to the redundant train equipment. Thus the underlying purpose of the rule would be satisfied without requiring the 20 foot minimum separation distance free of intervening combustible material between the diesel generator room exhaust fan outlets.

Exemption Requested

The licensee requested an exemption from Section III.G.2.b due to a lack of 20 feet of separation free of intervening combustible materials between redundant shutdown-related systems, the borated water storage tank (BWST) outlet valves in the radwaste processing area (Fire Area C, Zone 20-Y).

The staff's principle concern was that a fire of significant magnitude could damage these valves and prevent safe shutdown conditions from being achieved and maintained. However, the combustible loading in this area is low. Should a fire occur the existing fire detection system would sound an alarm in the control room. Soon thereafter the fire brigade would arrive and put out the fire using manual fire fighting equipment. Until the fire is controlled the 1-hour barrier installed around the cables associated with one of the BWST outlet valves would provide sufficient passive protection to assure one shutdown train would be free of fire damage. Also due to the low fire loading and the nature of the valve construction, should the valve electrical circuits become damaged, local manual valve operation would still be possible to align the proper

shutdown flowpath in sufficient time. On this basis the staff concludes that the licensee's alternate fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.b.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the low fire loading, the fire brigade response to the fire detection system control room alarm, and the 1-hour rated barrier on the cables for one of the two valves provides reasonable assurance that the redundant valve would be adequately protected. Additionally, local manual operation of the valves would be possible despite fire damage to electrical circuits. Thus the underlying purpose of the rule would be satisfied without requiring equipment separation.

Exemption Requested

The licensee requested an exemption from Section III.G.2.b due to a lack of 20 feet of separation free of intervening combustible materials between redundant shutdown-related systems in the emergency feedwater (EFW) pump room (Fire Area C, Zone 38-Y).

The staff's principle concern was that a fire of significant magnitude could damage redundant EFW trains and prevent safe shutdown from being achieved and maintained. However, the lack of 20 feet of separation between redundant divisions is not significant from a fire safety standpoint for the following reasons. The combustible loading is low in the EFW pump room. Any fire that occurred would be detected in its formative stages by the existing fire detection system before a significant room temperature rise occurred. This would sound an alarm in the control room. Soon thereafter the fire brigade

would arrive and put the fire out using the existing manual fire fighting equipment. Pending arrival of the fire brigade, should rapid fire propagation occur the existing and proposed cable fire barriers, the missile barrier between the two EFW pumps, and the proposed automatic sprinkler system would provide reasonable assurance that one division of EFW-related systems would remain free of damage. On this basis the staff concludes that the licensee's proposed alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.b.

This exemption is granted in part based on the licensee's commitment to complete the following modifications, by the end of the eighth refueling outage to provide additional protection for the turbine driven EFW pump: installation of 1-hour rated fire wrapping on the cables associated with automatic operation and an automatic sprinkler system.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the low fire loading, the automatic fire detection system combined with the timely response of the fire brigade, and the proposed installation of automatic fire suppression and fire wrapping committed to by the licensee, all provide assurance that the redundant safe shutdown equipment will be adequately protected. Thus, the underlying purpose of the rule would be satisfied without requiring the minimum of 20 feet of separation between redundant equipment.

Exemption Requested

The licensee requested an exemption from Section III.G.2.c due to a lack of an automatic fire suppression system to protect redundant shutdown-related

systems separated by a 1-hour fire barrier and protected by a fire detection system in the pipe area (Fire Area C, Zone 34-Y).

The staff's principle concern was that the lack of an automatic fire suppression system would permit a fire in the area to spread and result in the loss of safe shutdown capability. However due to the light fire loading in the area and the 1-hour rated fire wrapping on the B-train makeup/high pressure injection pump power cables, there is reasonable assurance that a fire in this area would not result in the loss of redundant trains of makeup pumps. Also, the existing fire detection system would sense the presence of a fire and sound an alarm in the control room. Soon thereafter the fire brigade would arrive and put the fire out manually with the existing fire fighting equipment. On this basis the staff concludes that the licensee's alternative fire protection configuration provides an equivalent level of protection to that achieved by compliance with Section III.G.2.c.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the low fire loading, the existing fire detection system combined with the timely response of the fire brigade, and the 1-hour rated barrier around the power cables for the B-train makeup pump, all provide assurance that the redundant safe shutdown equipment will be adequately protected. Thus the underlying purpose of the rule would be satisfied without requiring automatic fire suppression in this area.

Exemption Requested

The licensee requested an exemption from Section III.J due to a lack of 8-hour battery powered emergency lighting units on elevation 317 feet and

portions of the access paths to the steam pipe area on elevation 404 feet, the intake structure, and diesel fuel storage vaults, all of which are areas required to be manned for safe shutdown.

The staff's principle concern was that a lack of adequate emergency lighting could hinder or prevent licensee personnel from performing tasks necessary to achieve safe shutdown. The need for operators to access the safe shutdown equipment on elevation 317 feet occurs after the 8-hour battery powered emergency lighting time frame expires. By then normal lighting is expected to be restored.

For the remaining areas, the access paths were determined to be adequately lighted by the yard lighting which is backed up by the security diesel generator. This generator is not vulnerable to fire loss under the postulated fire scenarios. Additionally, the yard lighting is maintained as part of the licensee's plant security plan requirements. On this basis the licensee's alternate lighting arrangement in the subject areas achieves an equivalent level of safety to that required by compliance with Section III.J.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the existing lighting is adequate. Thus the underlying purpose of the rule would be satisfied without requiring installation of emergency lighting.

Exemption Requested

The licensee requested an exemption from Section III.G.2.a due to a lack of a complete 3-hour fire-rated barrier between redundant level transmitters for the safety grade condensate storage tank (QCST) (Yard Area).

The staff's principle concern was that a fire could result in damage to redundant components or cables associated with the QCST level indication. However, there are no significant unmitigated in-situ fire hazards which would represent a risk to these components. In addition, the introduction of significant quantities of transient combustibles is precluded by the difficult access to the location of the components. Should a fire occur it would probably be of limited magnitude, and the resulting smoke and hot gases would tend to be dissipated in the open air, away from the subject components. The physical configuration of the areas where the QCST level indication components are located will provide sufficient protection to assure that at least one safe shutdown train will remain free of fire damage until the fire brigade arrives to extinguish the fire utilizing existing fire fighting equipment. On this basis the staff concludes that the licensee's alternate fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.a.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the absence of significant in-situ fire hazards, and the physical location and arrangement of the equipment provide assurance that the redundant level indication equipment would be adequately protected until the fire was brought under control by the fire brigade. Thus the underlying purpose of the rule would be satisfied without requiring a 3-hour fire-rated barrier between the redundant QCST level transmitters.

Exemption Requested

The licensee requested an exemption from Section III.O due to a lack of a reactor coolant pump oil collection system that is designed to withstand a safe shutdown earthquake (SSE) and sized to hold the oil from all reactor coolant pumps.

The licensee stated in a letter dated August 15, 1984 that the reactor coolant pump lube oil systems are qualified to remain functional during and after an SSE. Therefore, the following guidance of Generic Letter 86-10, "Implementation of Fire Protection Requirements," applies:

> Where the RCP lube oil system is capable of withstanding the safe shutdown earthquake (SSE), the analysis should assume that only random oil leaks from the joints could occur during the lifetime of the plant. The oil collection system, therefore, should be designed to safely channel the quantity of oil from one pump to a vented closed container. Under this set of circumstances, the oil collection system would not have to be seismically designed.

The existing oil collection system is designed to safely channel the quantity of oil from one pump to a vented closed container, and so conforms with the above staff guidance. On this basis the staff concludes that the licensee's alternate design of the oil collection system provides an equivalent level of fire safety to that achieved by compliance with Section III.O.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the design of the reactor coolant pump lubricating systems and the oil collection systems meets certain criteria previously determined by the staff to be acceptable for assuring adequate fire safety. Thus the underlying purpose of the rule would be satisfied without requiring the oil collection system to be seismically qualified and capable of holding the oil contained in all of the reactor coolant pumps.

Exemption Requested

The licensee requested an exemption from Section III.G.2.b due to a lack of an automatic fire suppression system to protect redundant emergency feedwater (EFW) pump cables (Fire Area C, Zones 20-Y and 34-Y).

The staff's principle concern was that a fire of significant magnitude would occur and damage the redundant EFW pump cables. However, the fire loading in the area is low, consisting primarily of cables in trays. A fire in this area would be characterized initially by low heat release and limited flame propagation. The existing smoke detection system would be expected to actuate and sound an alarm in the control room. The fire brigade would promptly respond and extinguish the fire with the existing manual fire fighting equipment. Pending their arrival the spatial separations which is at least 26 feet between the cables of the redundant trains, provides reasonable assurance that at least one train would remain free of fire damage. On this basis the staff concludes that the licensee's existing fire protection provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.b.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the low fire loading, the spatial separation between redundant cable trains, and the automatic smoke detection system combined with the timely response of the fire brigade to the control room alarm, all provide assurance that the redundant safe shutdown equipment would be adequately protected until the fire is brought under control. Thus the underlying purpose of the rule would be satisfied without requiring an automatic fire suppression system.

IV.

Accordingly, the Commission has determined that pursuant to 10 CFR 50.12, this Exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission has further determined that special circumstances, as set forth in 10 CFR 50.12(a)(2)(ii), are present justifying the exemption, namely that the application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. Specifics are discussed in each exemption request, but in general the underlying purpose of the rule is to accomplish safe shutdown in the event of a single fire and maintain the plant in a safe condition. This is accomplished by assuring that sufficient undamaged equipment is available to support safe shutdown, assuming a fire within the area of concern. In the areas for which an exemption is being requested, passive as well as active fire protection features assure that any single fire will not result in the loss of safe shutdown capability. These features include separation distance, fire barriers, water spray systems to preclude propagation, and manual actions. The fire protection features, in conjunction with low combustible loadings and in some cases physical location and configurations, provide a high degree of assurance that a single fire will not result in loss of post-fire shutdown capability. At this time, the licensee has not completed two of the modifications upon which one of these exemptions is based. However, the licensee has in place acceptable compensatory measures and is committed to the completion of the modifications by the end of the eighth refueling outage.

Accordingly, the Commission hereby grants the exemptions from the requirements of 10 CFR Part 50, Appendix R as described in Section III above.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this Exemption will have no significant impact on the environment (53 FR 27091).

The Safety Evaluation concurrently issued and related to this action and the above referenced submittals by the licensee are available for public inspection at the Commission's Public document Room, 2120 L Street, N.W., Washington, D. C., and at the local public document room located at the Tomlinson Library, Arkansas Technical University, Russellville, Arkansas 72801.

This Exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Gary M. Holahan

Gary M. Holahan, Acting Director
Division of Reactor Projects - III, IV,
V and Special Projects
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 26th day of October, 1988

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

EVALUATION OF FIRE PROTECTION EXEMPTIONS

FACILITY OPERATING LICENSE NO. DPR-51

ARKANSAS POWER AND LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT NO. 1

DOCKET NO. 50-313

1.0 INTRODUCTION

By letter dated August 15, 1984, Arkansas Power and Light Company, (the licensee) requested approval of exemptions from the technical requirements of Sections III.G, III.J and III.O of Appendix R to 10 CFR Part 50. By letter dated August 30, 1985, the licensee requested approval of additional exemptions from Appendix R. Supplemental information was provided by the licensee in letters to the staff dated October 20, 1986, April 22, and June 24, 1987. The staff's evaluation of this information is contained in this report as follows: Sections 7.0 through 9.0 consist of the evaluation of specific exemption requests, and Section 10.0 consists of an evaluation of the licensee's fire hazards analysis concerning non-fire-rated features in fire area boundaries.

Section 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:

1. Separation of cables and equipment and associated non-safety 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;

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

3. Enclosure of cables and equipment and associated non-safety 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.

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If these conditions are not met, Section III.G.3 requires an alternative shutdown capability independent of the fire area of concern. It also requires that a fixed fire suppression system be installed in the fire area of concern if it contains a large concentration of cables or other combustibles. These alternative requirements are not deemed to be equivalent; however, they provide equivalent protection for those configurations in which they are accepted.

Because it is not possible to predict the specific conditions under which fires may occur and propagate, the design basis protective features are specified in the rule rather than a design basis fire. Plant specific features may require protection different from the measures specified in Section III.G. In such a case, the licensee must demonstrate, by fire hazards analysis, that 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 systems and associated circuits used to achieve and maintain safe shutdown are free of fire damage. Fire protection configurations must either meet the specific requirements of Section III.G or another fire protection configuration must be justified by a fire hazard analysis.

The staff's general criteria for accepting a different fire protection configuration are the following:

- The alternative assures that one train of equipment necessary to achieve hot shutdown from either the control room or emergency controls stations is free of fire damage.

- The alternative assures that fire damage to at least one train of equipment necessary to achieve cold shutdown will be limited such that it can be repaired within a reasonable time (minor repairs with components stored onsite).

- Modifications required to meet Section III.G would not enhance fire protection safety 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 DIESEL GENERATOR ROOM EXHAUST FAN OUTLETS (FIRE AREA B, FIRE ZONES 1-E AND 2-E)

2.1 Exemption Requested

The licensee requested approval of an exemption from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50 to the extent that it requires that redundant, shutdown-related systems be separated by a horizontal distance

of at least 20 feet free of intervening combustibles and be protected by automatic fire suppression and detection systems.

2.2 Discussion

The licensee stated that the following conditions in Fire Area B do not meet the technical requirements of Section III.G.2.b. In Fire Zones 1-E and 2-E of Unit 1, redundant diesel generator exhaust fan outlets are separated from each other by less than 20 feet of horizontal distance, and a fixed automatic fire suppression system is not installed.

Fire Zones 1-E and 2-E are on elevation 386 feet of Unit 1. Fire Zone 1-E is north of Fire Zone 2-E. They are located as follows:

- North of Fire Zone 112-I (the upper north electrical penetration room) and separated from it by a fire wall.
- West of Fire Zone 149-E (the sprinklered hot-tool room) and Fire Zone 120-E (boric acid addition tank and pump room).
- South of the Unit 1/Unit 2 boundary fire wall.
- Above Fire Zones 86-G (the Unit 1 north diesel generator room) and 87-H (the Unit 1 south diesel generator room) from which they are separated by a rated fire barrier.

Fire Zone 1-E is separated from Fire Zone 2-E by a reinforced concrete wall, except for a doorway-size opening at the east end of this wall. Also, the zones are not roofed. Safe shutdown related equipment in these zones consists of the outlets of the exhaust fans from the diesel generator rooms below. These zones are protected by an automatic fire detection system. The combustible loading in Fire Zones 1-E and 2-E are approximately equivalent severities of 1.5 and 1.2 minutes, respectively, on the ASTM E-119 time-temperature curve.

Redundant exhaust fan cabling is presently routed through Fire Zone 149-E. The licensee stated that one train of this cabling is enclosed in a 1-hour barrier where it passes through Fire Zone 149-E. This fire zone is protected by an automatic sprinkler system, a fire detection system and manual fire fighting equipment. The licensee subsequently rerouted the conduit for the exhaust fans associated with the north diesel generator room. The conduit was rerouted through the hot-tool room and the boric acid tank room and a 1-hour wrap was installed on the conduit in the hot-tool room.

The licensee also subsequently installed a 3-hour rated fire door in the opening of the reinforced concrete wall separating the redundant fan outlets and rerouted the power cables to the air intake louvers so that they are powered from vital power sources.

The licensee justified the exemption request on the basis of the existing protection and the modifications made.

2.3 Evaluation

The technical requirements of Section III.G of Appendix R are not met in this area because redundant diesel generator exhaust fan outlets are not separated by at least 20 feet free of intervening combustibles. The lack of area-wide fire detection and suppression systems in Fire Area B does not require an exemption per the guidance issued in Generic Letter (GL) 86-10. The staff was concerned that because of the absence of at least 20 feet of separation between the exhaust fan outlets, a pathway exists which could allow fire to spread and damage the redundant systems. Also, the lack of fixed suppression systems and fire detectors throughout this fire area could permit a fire to spread and result in the loss of safe shutdown capability. However, because of the light combustible loading in these fire zones, it is not expected that a fire of significant duration or magnitude will occur. There are no intervening combustibles between the redundant safe shutdown systems.

If a fire were to occur in or near one of the exhaust fans, it would be expected to develop slowly with initial low heat release and slow temperature rise. The lack of a roof over Fire Zones 1-E, and 2-E would preclude any accumulation of hot gases over this equipment, it would have to spread over and down into the room below, which is not considered credible. With the licensee's commitment to install 3-hour rated fire doors between redundant trains of equipment completed, the possibility of a single fire in one of these fire zones damaging redundant equipment is extremely unlikely, despite the horizontal separation distance of less than 20 feet between redundant trains.

Despite the lack of 20 or more feet of horizontal separation between redundant safe shutdown systems and the lack of fire detectors and an automatic fire suppression system throughout these zones, there is reasonable assurance that a fire will not result in the loss of safe shutdown capability. Therefore, the staff finds that separating cables and equipment of redundant exhaust fans by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards in Fire Zones 1-E, and 2-E, would not significantly increase the level of fire protection.

2.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's alternative fire protection configuration provides an equivalent level of safety to that achieved by compliance with Section III.G of Appendix R. Therefore, the licensee's request for exemption from the requirements for 20 feet of separation, free of intervening combustibles between the diesel generator exhaust fan outlets is approved. The licensee's fire hazards evaluation concerning the

absence of area-wide fire detectors and a fire suppression system in Fire Area B conforms with the guidance in GL 86-10. No exemption for this condition is therefore required.

3.0 RADWASTE PROCESSING AREA (FIRE AREA C, ZONE 20-Y)

3.1 Exemption Requested

The licensee requested approval of an exemption from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50 to the extent that it requires that redundant shutdown-related systems be separated by a horizontal distance of at least 20 feet free of intervening combustibles.

3.2 Discussion

The licensee stated in the August 30, 1985 submittal that redundant borated water storage tank (BWST) outlet valves CV1407 and CV1408 are separated by less than 20 feet of horizontal distance. These valves are located at the west end of Fire Zone 20-Y on elevation 335 feet. The combustibles in this zone include lube oil on the south side of the zone. The combustible loading is approximately 5,784 Btu per square foot which produces an equivalent fire severity of less than 5 minutes on the ASTM E-119 time-temperature curve.

Fire protection in the zone consists of closed-head sprinklers on a 10-foot spacing and fire detectors. The sprinklers were installed as a water curtain to protect the opening between the fire area and Fire Area B on elevation 354 feet.

A 1-hour rated fire barrier was installed to protect one train of conduit associated with the BWST valves. The licensee stated in the October 20, 1986 submittal that these valves are normally closed, but must be open for hot shutdown. The valves can be manually operated, but do not have to be opened until 1-1/2 hours after a fire has started.

3.3 Evaluation

The technical requirements of Section III.G are not met in this area because the redundant BWST outlet valves are not separated by more than 20 feet free of intervening combustibles. The staff was concerned that a fire of significant magnitude could damage these valves and prevent safe shutdown conditions from being achieved and maintained.

However, the combustible loading in this area is low. If a fire should occur, it would be detected by the existing fire detection system, and an alarm would be transmitted to the control automatically. The fire brigade would subsequently be dispatched and would put out the fire using the available manual

fire fighting equipment. Pending arrival of the brigade, the 1-hour barrier which has been installed around the cables associated with one of the BWST valves would provide sufficient passive protection to assure that one shutdown division would be free of fire damage. Because of the low fire loading and the nature of the valve construction, the staff would not expect the valve assembly to be affected by the elevated room temperature produced by a fire. Therefore, if the fire should damage the electric circuits, the valve could still be manually realigned to re-establish the shutdown flowpath in sufficient time. On this basis, the staff finds that the lack of 20 feet of separation free of intervening combustibles is not significant from a fire safety standpoint.

3.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's alternate fire protection configuration provides an equivalent level of safety to that achieved by compliance with Section III.G of Appendix R. Therefore, the licensee's request for exemption from the requirement for 20 feet of separation free of intervening combustibles, between the BWST outlet valves is granted.

4.0 EMERGENCY FEEDWATER PUMP ROOM (FIRE AREA C, ZONE 38-Y)

4.1 Exemption Requested

The licensee requested approval of an exemption from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50 to the extent that it requires that redundant shutdown-related systems be separated by at least 20 feet free of intervening combustibles, and the area be protected by an automatic fire suppression system.

4.2 Discussion

Fire Zone 38-Y, the emergency feedwater (EFW) pump room is located on the 335-foot elevation of Unit 1 at the south end of Fire Area C. This fire zone contains the following two EFW pumps and the EFW suction supply valves:

- Pump P7A, the turbine-driven EFW pump is located on the south side of the EFW pump room. It contains approximately 8 gallons of oil fully enclosed in heavy-gauge metal.

- Pump P7B, the motor-driven EFW pump is located on the north side of the room. It contains approximately 2 gallons of oil.

- The pumps are separated by a 6-foot high missile barrier, which is approximately the same length as P7A. However, P7A and P7B are slightly offset in a lengthwise direction so that the west ends of both pumps can "see" each other.

- The horizontal separation distance between the pump baseplates is 5 feet, 10 inches.

There are no intervening combustibles in the EFW pump room because the lube oil associated with the pumps is enclosed in the pumps, and because skid-mounted lube oil piping and all cables in the room are in conduit. The fire hazards in the room are the lube oil, which is associated with the turbine-driven EFW pump (P7A), and transient combustibles. The combustible loading in this room is approximately 3,333 Btu per square foot, which produces an equivalent severity of 2.5 minutes on the ASTM E-119 time-temperature curve. The fire protection in this room consists of two smoke detectors mounted on the ceiling. Manual fire fighting equipment is also available.

Suction valves associated with the service water and condensate supplies to both pumps are mounted approximately 3-1/2 feet above the floor on the north wall of this zone adjacent to P7B. These valves are normally open and would fail open in the event that power is lost. Cabling associated with the valves and each EFW pump is routed in separate conduits from each component to and along the ceiling of the room. Therefore, it is not credible to assume that a hot short or other fault resulting from a fire in this area would cause both valves to close. In addition, a 1-hour fire-rated barrier was installed on the cabling associated with P7B.

The licensee performed an evaluation of potential consequences of a fire in this room and concluded that:

- The EFW suction supply valves would be manually operable following a fire, even if their power and control cables were destroyed.

- P7A could be manually operated if its control cable was destroyed. Manual controls are located at the pump.

- The heat from a fire in the room would dissipate through the open doorway to the remainder of Fire Area C.

- In case of a fire, access to the room would be possible after 2-1/2 minutes.

- Ten minutes would be required for the operator to implement the manual EFW pump control procedure, as compared with over 30 minutes before RCS subcooling would be lost.

In addition, by letter dated April 22, 1987, the licensee committed to install a partial, automatic sprinkler system designed to provide protection for the steam-powered pump; and by letter dated June 24, 1987 the licensee committed to protect cabling necessary to provide automatic operation of the turbine driven pump by wrapping the cable in a 1-hour rated fire barrier in Zone 38-Y. These modifications are scheduled for completion during the eighth refueling outage in the Fall of 1988.

4.3 Evaluation

The technical requirements of Section III.G are not met in this area because redundant cables and equipment required for safe shutdown are not separated by a horizontal distance of at least 20 feet free of intervening combustible materials. The licensee's fire hazards evaluation concerning the absence of an area-wide fire suppression system in Fire Area C conforms with the guidance in GL 86-10. Therefore, no exemption for this condition is necessary.

The staff's principal concern was that a fire of significant magnitude could damage redundant EFW trains and prevent safe shutdown from being achieved and maintained. However, the combustible loading in this area is low. If a fire were to occur, it would be detected by the existing fire detection system in its formative stages before significant room temperature rise occurred. The fire brigade would be dispatched and would put out the fire using the existing manual fire fighting equipment. If rapid fire propagation occurred before the arrival of the brigade, the existing and proposed cable fire barriers, missile barrier and the proposed automatic sprinkler system would provide reasonable assurance that one division of EFW-related systems would remain free of damage. Therefore, the lack of more than 20 feet of separation between redundant divisions is not significant from a fire safety standpoint.

4.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's proposed alternate fire protection configuration provides an equivalent level of safety to that achieved by compliance with Section III.G of Appendix R. Therefore, the licensee's request for exemption from the requirement for at least 20 feet of separation between EFW-related systems in this area is granted. The licensee's fire hazards evaluation concerning the absence of an area-wide fire suppression system in this location conforms with the guidance in GL 86-10, and therefore, no exemption for this condition is required.

5.0 PIPE AREA (FIRE AREA C, FIRE ZONE 34-Y)

5.1 Exemption Requested

The licensee requested approval of an exemption from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50 to the extent that it requires an automatic fire suppression system in an area where redundant shutdown related systems are separated by a 1-hour fire barrier and protected by a fire detection system.

5.2 Discussion

Fire Zone 34-Y located on elevation 335 feet is south of Fire Zone 31-Y, west and north of Fire Area C/Fire Area P boundary wall, and east of Fire Zone 20-Y.

The combustible loading in Fire Zone 34-Y is 1,353 Btu per square foot, which produces an equivalent severity of 1 minute on the ASTM E-119 time-temperature curve.

Power cables to the three makeup pumps (P36A, B, and C) in Fire Zone 20-Y are routed through Fire Zone 34-Y. The power cables for pump P36A are 19 feet, 8 inches south of the P36B power cables. The P36C power cables are 1-foot north of the P36B power cables. there are no intervening combustibles and all cables are in conduit. The P36B power cable is enclosed in a 1-hour fire rated barrier. Existing fire protection also includes a fire detection system, portable fire extinguishers and manual hose stations.

The licensee justifies the absence of an automatic fire suppression system on the basis of the low fire loading and the existing protection.

5.3 Evaluation

The technical requirements of Section III.G of Appendix B have not been met in this location because of the lack of an automatic fire suppression system. The staff was concerned that the lack of an automatic fire suppression system could permit a fire in the area to spread and result in the loss of safe shutdown capability. However, because of the light combustible loading in this location, especially near the makeup pump power cables, it is not expected that a fire of significant duration or magnitude would occur.

If a fire were to occur, it would develop slowly with initial low heat release and slow rise in room temperature. The light combustible loading (1-minute equivalent severity) and the 1-hour fire barrier wrap on train B of the makeup pump power cables provide reasonable assurance that a fire in this area would not result in the loss of redundant trains of makeup pumps. In addition, despite the lack of an automatic fire suppression system throughout the fire area, a fire should be detected by the installed fire detection systems. The detectors' alarms would annunciate in the control room and the fire brigade would be dispatched to extinguish the fire using the existing manual fire fighting equipment.

5.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's alternate fire protection configuration provides an equivalent level of protection to that achieved by compliance with Appendix R. Therefore, the licensee's request for exemption from the requirement for an automatic fire suppression system in this location is approved.

6.0 EMERGENCY LIGHTING ON ELEVATION 317 FEET OF UNIT 1, PORTIONS OF THE ACCESS PATHS TO THE STEAM PIPE AREA ON ELEVATION 404 FEET, THE INTAKE STRUCTURE, AND DIESEL FUEL STORAGE VAULTS

6.1 Exemption Requested

The licensee requested approval of an exemption from the technical requirements of Section III.J of Appendix R to 10 CFR Part 50 to the extent that it requires 8-hour battery powered emergency lighting units in areas required to be manned for safe shutdown and in access and egress paths to these areas.

6.2 Discussion

The safe shutdown related equipment on elevation 317 feet includes the decay heat pumps, associated valves, and room coolers. This equipment is not required until cold shutdown, which is not initiated for approximately 113 hours following a fire. These areas are provided with diesel-backed ac lighting and the plant operators have flashlights which can provide sufficient illumination.

The access path to the AHC-1 steam pipe area, which is not lighted is across the start-up boiler room roof from the turbine building, and up a set of stairs to a door at the entrance to the steam pipe area. Access to the intake structures and the diesel fuel vaults is through the yard area between the turbine building and these buildings. All of the exterior areas described above are illuminated by the yard lighting, which is part of the station security system and, therefore, are provided with backup power by the security diesel generator. The security diesel generator is initiated when there is a loss of power in the administration building. The security diesel generator is fueled by a dedicated day tank, which is refilled from the 19,000-gallon capacity start-up boiler diesel fuel day tank. The full load rating of the security diesel genertor fuel supply is 24 hours.

6.3 Evaluation

The technical requirements of Section III.J are not met because the subject locations are not provided with fixed, 8-hour battery powered emergency lighting units.

The safe shutdown related equipment on elevation 317 feet is not required until cold shutdown, which would be beyond the 8-hour time frame that battery powered lighting would be available. By the time operators would be expected to travel through this elevation, normal lighting is expected to be restored. Therefore, the absence of 8-hour battery powered lighting units in this location is not safety significant.

For the remaining areas referenced above, yard lighting is available. The staff had several concerns regarding reliance upon this illumination method. The first was that hand held lights would be relied upon as the sole means of illumination. The licensee has confirmed that, while the operators will be carrying flashlights, they will only be relied on to supplement the security lighting. Further, if the flashlights become inoperable, or cannot be used while performing the safe shutdown function, the security lighting itself would supply sufficient illumination.

The second concern 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. However, the security lighting is supplied power from the security diesel and is not vulnerable to fire loss under the postulated fire scenario. The third concern was that the level of illumination would not be sufficent to provide reasonable assurance that the safe shutdown function could be achieved. The licensee conducted a walkdown of the yard areas and confirmed that an adequate level of illumination has been provided. The staff was also concerned that the security lighting would not be maintained. However, the licensee indicated that this lighting is inspected and maintained as part of the plant security requirements.

6.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's alternate lighting arrangement in the subject areas achieves an equivalent level of safety to that required by compliance with Section III.J of Appendix R. Therefore, the licensee's request for exemption from the requirements for 8-hour battery powered lighting units in these areas is approved.

7.0 LEVEL TRANSMITTERS FOR THE SAFETY-GRADE CONDENSATE STORAGE TANK (YARD AREA-UNITS 1 AND 2

7.1 Exemption Requested

The licensee requested approval of exemptions from the technical requirements of Section III.G.2, of Appendix R to 10 CFR Part 50 to the extent that it requires a 3-hour fire barrier between redundant safe shutdown systems.

7.2 Discussion

The Safety-Grade Condensate Storage tank (CCST) for each unit is located in the yard approximately 142 feet west of the Auxiliary Building (to the centerline of the tank), and is surrounded by an 18 inch thick concrete wall approximately five feet high. There is a valve pit adjacent to the south side of the tank and outside the wall. The pit measures 11'6" by 12'6" and is connected to

the Auxiliary Building by a pipe chase. The chase is separated from the Auxiliary Building by a 3-hour fire barrier. The walls of the chase and pit are reinforced concrete and below grade. The roof of the chase and a portion of the roof of the pit is made of removable, concrete slabs. The remainder of the roof of the pit is reinforced concrete. Access to the pit is through an adjacent open hatchway.

At least one train of QCST level indication is required for safe shutdown in order to provide information to the operators so that appropriate manual actions may be initiated to align EFW suction to an alternate water supply before the condensate inventory in the QCST is exhausted. Several hours are available before QCST level indication is required. One level transmitter is located inside the pit and the other transmitter is located next to the tank, inside the wall, and under a tornado missile shield. Cabling for the transmitter located in the pit is enclosed in conduit and is routed through the pipe chase to the Auxiliary Building. Cabling for the other transmitter is routed in concrete-encased conduit embedded in the ground adjacent to the pipe chase. At the tank, the conduit emerges inside the wall and under the missile shield.

At the Auxiliary Buidling it emerges from the ground and is routed up the side of the building, where it penetrates the building about 25 feet above the ground. This portion of the conduit is enclosed by steel missile barrier.

The valve pit, the pipe chase and the area inside the wall contain no in situ combustibles. All cabling is enclosed in conduit. Fire suppression capability consists of a fire hydrant and hose house located in the immediate vicinity at the south side of the tank.

There are not external fire hazards that could compromise the operability of both level transmitters. The warehouse and office are each located greater than 50 feet west of the tank, and each is equipped with an automatic fire suppression system. The emergency Diesel fuel tanks are located in a below-grade vault approximately 200 feet to the north. The above-ground bulk diesel fuel storage tank is located about 300 feet to the north and is enclosed by a earthen dike sized to contain the entire volume of fuel in the tank.

The licensee justifies the exemption on the basis that there are no unmitigated fire hazards in the vicinity of the transmitters and that the physical configuration, as described above, is sufficient to assure that at least one transmitter and its associated cabling will remain free of fire damage.

7.3 Evaluation

The technical requirements of Section III.G.2 are not met in the above referenced locations because redundant QCST level transmitters and their associated cabling are not completely separated by a 3-hour fire-rated barrier.

The staff was originally concerned that a fire could result in damage to the redundant components or cables. But, as described by the licensee, there are no significant unmitigated in-situ fire hazards which would represent a risk to these systems. In addition, access to these locations is difficult, which would preclude the introduction of significant quantities of transient combustibles.

If a fire did occur under these circumstances it would be expected to be of limited magnitude. The smoke and hot gases produced by the fire would tend to be dissipated in the open air, away from the subject systems. The fire would be able to be extinguished by the plant fire brigade using the existing normal fire fighting equipment. Pending arrival of the brigade, the physical configuration of the areas, including the wall and tornado missile shield, will provide sufficient protection to assure that at least one safe shutdown train will remain free of fire damage. Therefore, the provision of additional fire protection to conform with the criteria of Section III.G.2 will not significantly increase fire safety.

7.4 Conclusion

Based on the above evaluation the staff concludes that the licensee's alternate fire protection configuration provides an equivalent level of safety to that achieved by compliance with Appendix R. Therefore, the licensee's request for exemption from the requirements of Section III.G.2 for the QCST level transmitters and their related cabling should be granted.

8.0 REACTOR COOLANT PUMP OIL COLLECTION SYSTEM

8.1 Exemption Requested

The licensee requested approval of exemptions from the technical requirements of Section III.O of Appendix R to 10 CFR Part 50 to the extent that it requires the reactor coolant pump (RCP) oil collection system to be sized to hold the contents of the entire lube oil system for all pumps and to be designed to withstand a safe shutdown earthquake (SSE).

8.2 Discussion

The RCP Oil Collection Systems at each unit contains two tanks. These tanks are each designed to hold the contents of one reactor coolant pump's lube oil inventory with margin. Oil leakage from the remaining pump in each RCS loop will be drained into the appropriate tank, until the tank capacity is reached, and then to an open curbing where it can be safely contained. The system is located above the floor of the Containment Building. Safe shutdown circuitry is routed approximately forty feet above that elevation outside the

primary shield walls containing the reactor, RCPs, and other primary system components. The shield wall separates the heavy concentrations of safe shutdown circuitry in the electrical penetration areas from the RCPs and the Oil Collection System itself. Additionally, that circuitry is protected by localized automatic fire suppression and detection capability. The Reactor Coolant Pump motor lube oil systems are integral with the pump motors. The licensee stated in the August 15, 1984 submittal, that the lube oil systems are qualified to remain functional during and after a SSE.

8.3 Evaluation

The technical requirements of Section III.O of Appendix R have not been met because the oil collection system for the RCPs has not been sized to hold the oil from all of the pumps and is not seismically designed.

Generic Letter 86-10 states:

"Where the RCP lube oil system is capable of withstanding the safe shutdown earthquake (SSE), the analysis should assume that only random oil leaks from the joints could occur during the lifetime of the plant. The oil collection system, therefore, should be designed to safely channel the quantity of oil from one pump to a vented closed container. Under this set of circumstances, the oil collection system would not have to be seismically designed."

On the basis that the lube oil system at ANO-1 is capable of withstanding the SSE without rupture and that the existing oil collection system will channel random leaks to a vented and closed container, the existing design conforms with the above staff guidance.

8.4 Conclusion

Based on the above evaluation, the licensee's alternate design of the oil collection system provides an equivalent level of safety to that achieved by compliance with Section III.O of Appendix R. Therefore, the licensee's request for exemption is approved.

9.0 AUXILIARY BUILDING ELEVATION 335 FEET (FIRE AREA C, ZONES 20-Y, AND 34-Y)

9.1 Exemption Requested

The licensee requested approval of an exemption from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50 to the extent that it requires an automatic fire suppression system be installed in an area to protect redundant shutdown systems which are separated by twenty feet and protected by a fire detection system.

9.2 Discussion

Fire Zones 20-Y and 34-Y are located on elevation 335 feet of the auxiliary building. The combustible loading in these locations is 656 and 1,353 BTU's per square foot, respectively. This is equivalent to a fire severity of about 1 minute as determined from the ASTM E-119 time-temperature curve. The licensee has stated that power cabling for the electric driven EFW pump is in the corridor in Zone 34-Y. The control cabling for the turbine driven pump is located in Zone 20-Y. The cabling is separated by at least 26 feet with the only in-situ combustible consisting of a monorail with an isolated cable run to a small electric motor.

Existing fire protection includes an area-wide fire detection system, and manual fire fighting equipment.

The licensee justifies the exemption on the basis of the limited hazard and the existing protection.

9.3 Evaluation

The technical requirements of Section III.G. are not met in this location because of the lack of an automatic fire suppression system in the area.

The staff was concerned that a fire of significant magnitude would occur and damage the redundant EFW pump cables. However, the fire loading in these locations is negligible and consists primarily of cables in trays. If a fire would occur it would be characterized, initially, by low heat release and limited flame propagation. The existing smoke detection system would be expected to actuate and transmit an alarm automatically to the control room. The plant fire brigade would be dispatched and would be capable of putting out the fire using the existing manual fire fighting equipment. Pending arrival of the brigade, the existing spatial separation would provide reasonable assurance that at least one shutdown division would remain free of fire damage. Therefore, the lack of an automatic fire suppression system is not safety significant.

9.4 Conclusion

Based on the above evaluation, the licensee's existing fire protection provides an equivalent level of safety to that achieved by compliance with Appendix R. Therefore, the licensee's request for exemption from the requirement for an automatic fire suppression system in the subject locations is approved.

10.C RADWASTE PROCESSING AREA, FIRE BARRIER OPENING (FIRE AREA C, FIRE ZONE 20-Y) LOWER NORTH PIPING PENETRATION ROOM, STRUCTURAL STEEL (FIRE AREA C, FIRE ZONE 53-Y LOWER NORTH ELECTRICAL PENETRATION ROOM AND UNCONTROLLED ACCESS AREA, STRUCTURAL STEEL (FIRE AREA I, FIRE ZONES 112-I AND 98-J

10.1 Exemptions Requested

The licensee requested approval of exemptions from the technical requirements of Section III.G of Appendix R to 10 CFR Part 50 to the extent it requires that redundant shutdown-related systems be separated by a 3-hour fire-rated barrier.

10.2 Discussion

Radwaste Processing Area

The licensee stated in the August 15, 1984 submittal that an opening in the fire barrier separating Fire Area C from Fire Area B is not a fire rated construction. Fire Zone 20-Y is on elevation 335 feet. It contains the three makeup/HPI pumps and the BWST valves. The pumps are in cubicles on the south side of the fire zone. The valves are in a room on the west side of the zone and are connected to Fire by fire detectors. A line of closed-head sprinklers on a 10-foot spacing was installed in the valve area to serve as a water curtain separating the two fire areas. The combustible loading in this fire area is approximately 5,600 Btu per square foot, which produces an equivalent fire severity of about 4 minutes on the ASTM E-119 time-temperature curve.

Lower North Piping Penetration Room

The licensee stated in the August 15, 1984 and the August 30, 1985 submittals that the structural steel supporting the fire barrier between Fire Area C on elevation 335 feet and Fire Area B on elevation 360 feet is not protected to provide a 3-hour fire resistance rating. Fire Zone 53-Y contains no in-situ combustibles. Fire Area C has a combustible loading of approximately 5,600 Btu per square foot, which produces an equivalent fire severity of about 4 minutes on the ASTM E-119 time-temperature curve.

Lower North Electrical Penetration Room

The licensee stated in the August 15, 1984 and the August 30, 1985 submittals that the structural steel supporting the fire barrier between Fire Zones 112-I and 98-J of Fire Area I (on elevations 372 and 373 feet, 6 inches, respectively) and Fire Zone 129-F of Fire Area G (on elevation 386 feet) is not protected to provide a 3-hour fire resistance rating. The combustible contents of Fire Area I are comprised of electrical cable insulation. The combustible loading

in the fire area is approximately 72,000 Btu per square foot, which produces an equivalent fire severity of about 55 minutes on the ASTM E-119 time-temperature curve.

Fire zone 98-J is protected by a deluge sprinkler system, which is actuated by ceiling-mounted smoke detectors and line-type heat detectors installed in the cable trays. Fire Zone 112-I is protected by a preaction sprinkler system, which is activated by ceiling-mounted smoke detectors.

10.3 Evaluation

The above-referenced features exist in the boundary construction of individual fire areas and, as such, come within the guidance issued in GL 86-10. No exemptions for these conditions are therefore necessary. The staff considers the licensee's submittals as constituting the required fire hazards analysis. The staff's principal concern was that a fire of significant magnitude would propagate from the area of fire origin into the adjoining fire area and damage redundant systems required for safe shutdown. If a fire were to occur in the subject locations, it would be detected in its formative stages by the existing fire detection systems. The fire brigade would be dispatched and would suppress the fire before significant damage occurred. Pending arrival of the brigade, the existing construction is adequate to confine the effects of the fire to the area of origin. Therefore, the lack of a complete fire-rated barrier at these locations is not significant from a fire-safety standpoint.

10.4 Conclusion

The licensee's analysis of the non-fire-rated features in the perimeter of the subject fire areas conforms with the guidance in GL 86-10 and is, therefore, acceptable.

11.0 ENVIRONMENTAL CONSIDERATIONS

The NRC staff has previously concluded, pursuant to 10 CFR 51.32, that the issuance of these exemptions will not have a significant impact on the quality of the human environment (53 FR 27091, July 18, 1988).

12.0 SUMMARY

Based on its evaluation, the staff concludes that the licensee's alternate fire protection configuration in the identified areas provides an equivalent level of safety to that achieved by compliance with Appendix R. Therefore, the licensee's request for exemption for the following conditions is approved:

1. Lack of 20 feet of separation free of intervening combustible materials between redundant shutdown-related systems in the diesel generator room exhaust fan outlets area (Fire Area B, Zones 1-E and 2-E).

2. Lack of 20 feet of separation free of intervening combustibles, between the borated water storage tank outlet valves in the radwaste processing are (Fire Area C, Zone 20-Y).

3. Lack of 20 feet separation free of intervening combustible materials between redundant shutdown-related systems in the emergency feedwater pump room (Fire Area C, Zone 38-Y).

4. Lack of an automatic fire suppression system to protect redundant shutdown-related systems in the pipe area (Fire Area C, Zone 34-Y).

5. Lack of 8-hour battery powered emergency lighting units on elevation 317 feet of Unit 1 and portions of the access path to the steam pipe area on elevation 404 feet, the intake structure, and diesel fuel storage vaults.

6. Lack of a complete 3-hour fire-rated barrier between redundant level transmitters for the safety grade condensate storage tank (Yard Area Unit 1 and 2).

7. Lack of a reactor coolant pump oil collection system that is designed to withstand a safe shutdown earthquake and that is sized to hold the oil from all reactor coolant pumps.

8. Lack of an automatic fire suppression system to protect redundant emergency feedwater pump cables in the auxiliary building on elevation 335 feet (Fire Area C, Zones 34-Y and 20-Y).

In addition, based on its evaluation of the licensee's submittals, the staff concludes that the licensee's analysis of the partial fire detection and suppression systems in Fire Area B, the partial sprinkler system in the EFW Pump Room, and the non-fire-rated features in certain fire area boundaries, as described above, conform with the guidance issued in GL 86-10 and are, therefore, acceptable.

Principal Contributor: D. Kubicki

Dated: October 26, 1988