October 16, 1984

Docket No. 50-247

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Mr. John D. O'Toole
Vice President
Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, New York 10003

Dear Mr. O'Toole:

By letter dated January 10, 1983 you requested sixteen technical exemptions from 10 CFR 50, Appendix R, Sections III.G, III.J and III.O. Subsequently, by letter dated July 13, 1983 two additional exemptions were requested. By letters dated July 13, July 29 and September 9, 1983 you provided additional information and commitments regarding these 18 exemptions and by letter dated September 9, 1983 one of these requests was withdrawn.

With respect to the original eighteen exemption requests the enclosed grants fifteen exemptions. These fifteen approved requests are:

1. Containment Spray Pump Room and Primary Water Makeup Pump Room (Fire Zones 2/2A).
2. Waste Storage and Drumming Station (Zone 6A)
3. Switchgear Room (Zone 14).
4. Screen Well Area (Zone 22).
5. Yard Manhole No. 21.
6. Reactor Coolant Pump - Oil Collection Tanks.
7. Component Cooling Pump Room (Zone 1)
8. Auxiliary Boiler Feed Pump Room (Zone 23)
9. Piping and Electrical Tunnel, Piping Penetration Area (Zone 1A)
10. Charging Pump Room (Zone 5)
11. Corridor (Zone 7A)
12. Valve Room and Stairwell (Zone 13A)
13. Control Room (Zone 15)
14. Valve Room and Corridor (Zones 18A and 3A)
15. Electrical Penetration Area (Zone 74A)

By this letter we have completed our review of 10 CFR 50, Appendix R, Section III.G.2. By prior letter dated March 30, 1984, we completed our review of 10 CFR 50, Appendix R. Sections III.G.3 and III.L. In sum, this and the prior letter complete our review of the above IP-2 technical exemption and the prior letter complete our review of the above IP-2 technical exemption requests. Your exemptions requests concerning HVAC Exhaust fans and emergency lighting are still under review.

By letter dated July 5, 1984 you requested a schedular exemption from 10 CFR 50.48(c). You requested that emergency lighting installation, required at the completion of the present refueling outage, be deferred until three months after plant startup. This will allow time for installation and for field test/walkdown to determine adequacy. The enclosed exemption grants this extension. At the completion of installation and test/walkdown you are to provide a report which describes the actual installation, specifies the methodolgy used to determine adequacy during the test/walkdown, and provides the results of test/walkdown. This report will provide additional information needed for our evaluation of the exemption request and is due three months from the date of plant startup.

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

Sincerely,

/s/DEisenhut

Darrell G. Eisenhut, Director
Division of Licensing

Enclosures:
1. Exemption
2. Notice of Exemption

cc w/enclosure:
See next page

*See previous white for concurrences

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| CParrish | PPolk/ps | TWambach | SVarga | WShields | GLainas |
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| *D:DL | D:NRR |
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| DEisenhut | DHeaton |
| 10/15/84 | 10/16/84 |

By letter dated July 5, 1984 you requested a schedular exemption from 10 CFR 50.48(c). You requested that emergency lighting installation, required at the completion of the present refueling outage, be deferred until three months after plant startup. This will allow time for installation and for field test/walkdown to determine adequacy. The enclosed exemption grants this extension. At the completion of installation and test/walkdown you are to provide a report which describes the actual installation, specifies the methodolgy used to determine adequacy during the test/walkdown, and provides the results of test/walkdown. This report will provide additional information needed for our evaluation of the exemption request and is due three months from the date of plant startup.

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

Sincerely,

Original signed by
Darrell G. Eisenhut

Darrell G. Eisenhut, Director
Division of Licensing

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10/16/84

By letter dated July 5, 1984 you requested a schedular exemption from 10 CFR 50.48(c). You requested that emergency lighting installation, required at the completion of the present refueling outage, be deferred until three months after plant startup. This will allow time for installation and for field test/walkdown to determine adequacy. The enclosed grants this extension. We are still evaluating your exemption request of July 13, 1983 regarding emergency lighting (4.16). At the completion of installation and test/walkdown you are to provide a report which describes the actual installation, specifies the methodolgy used to determine adequacy during the test/walkdown, and provides the results of test/walkdown. This report will provide additional information needed for our evaluation of the exemption request and is due three months from the date of plant startup.

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

Sincerely,

Darrell G. Eisenhut, Director
Division of Licensing

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be deferred until three months after plant startup. This will allow time for installation and for field test/walkdown to determine adequacy. The enclosed grants this extension. At the completion of installation and test/walkdown you are to provide a technical exemption request which describes the actual installation, specifies the methodolgy used to determine adequacy during the test/walkdown, and provides the results of test/walkdown. Your submittal is due three months from the date of plant startup.

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

Sincerely,

Darrell G. Eisenhut, Director
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7590-01

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-247

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

NOTICE OF EXEMPTION FROM APPENDIX R TO 10 CFR 50

FIRE PROTECTION REQUIREMENTS

I.

The Consolidated Edison Company of New York (the licensee) is the holder of Facility Operating License No. DPR-26 which authorizes operation of the Indian Point Nuclear Generating Plant, Unit No. 2. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

The facility consists of one pressurized water reactor at the licensee's site located in Westchester County, New York.

II.

On November 19, 1980, the Commission published a revised Section 10 CFR 50.48 and a new Appendix R to 10 CFR 50 regarding fire protection feature of nuclear power plants (45 FR 76602). The revised Section 50.48 and Appendix R became effective on February 17, 1981. Section 50.48(c) established the schedules for satisfying the provisions of Appendix R. Section III of Appendix R contains fifteen 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 these fifteen subsections, III.G, III.J and III.O, are the subject of this exemption request.

DJC 8402240723

III.

1.0 Technical Exemptions

By letter dated March 19, 1981, the licensee stated that Indian Point, Unit 2 was in full compliance with Appendix R, Sections III.G, III.J and III.O. In a subsequent meeting with the licensee, it became apparent that they may have misinterpreted certain fire protection requirements of Appendix R. We informed the licensee that compliance with Appendix R had to be assessed on the basis of valid fire areas and that where fire detectors and a fixed fire suppression system were required, these fire protection system had to be provided throughout the fire area or their absence justified by approved exemptions.

By letter January 10, 1983, the license requested sixteen exemptions from the fire protection requirements of Sections III.G. and III.O of Appendix R. Subsequently by letter dated July 13, 1983 two additional exemptions were requested.

By letters dated July 13, July 29 and September 9, 1983, the licensee provided additional information, which included commitments to provide added fire protection in several areas.

In the September 9, 1983 letter, the licensee withdrew an exemption request which pertained to fire barriers, because potential deviations from Appendix R had been resolved by proposed modifications or other exemptions. Two exemption requests, HVAC exhaust fans and emergency lighting, are still under review.

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 with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or

(3) Enclosure of cable 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.

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 a fixed fire suppression system to 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 the design basis fire. Plant specific features may require protection different than 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 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 an alternative fire protection configuration must be justified by a fire hazard analysis.

Our general criteria for accepting an alternative 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 control stations is free of fire damage.

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

- 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.

Based on our evaluation, we find 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 these areas should be granted:

1. Containment Spray Pump Room and Primary Water Makeup Pump Room (Fire Zones 2/2A)
2. Waste Storage and Drumming Station (Zone 6A)
3. Switchgear Room (Zone 14)
4. Screen Well Area (Zone 22)

5. Yard Manhole No. 21.
6. Reactor Coolant Pump - Oil Collection Tanks
7. Component Cooling Pump Room (Zone 1)
8. Auxiliary Boiler Feed Pump Room (Zone 23)
9. Piping and Electrical Tunnel, Piping Penetration Area (Zone 1A)
10. Charging Pump Room (Zone 5)
11. Corridor (Zone 7A)
12. Valve Room and Stairwell (Zone 13A)
13. Control Room (Zone 15)
14. Valve Room and Corridor (Zones 18A and 3A)
15. Electrical Penetration Area (Zone 74A)

Details of the evaluation can be found in the Exemption.

2.0 Schedular Exemption

2.1 Introduction

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

Section 50.48(c) requires completion of all modifications to meet the provisions of Appendix R within a specified time from the effective date of this fire protection rule, February 17, 1981, except for modifications to provide alternative safe shutdown capability.

By letter dated July 5, 1984 the Consolidated Edison Company requested exemption from 10 CFR 50.48(c) with respect to the requirements of Subsection III.J of Appendix R as follows:

Section 50.48(c)(3) specifies the installation schedule of those fire protection features such as emergency lighting (III.J) that require

a plant shutdown to complete the installation. The installation schedule in Section 50.48(c)(3) requires the completion of the installation of such fire protection features during the first refueling outage commencing after 180 days from the effective date of Appendix R (February 17, 1981). Hence, Section 50.48(c)(3) requires the licensee to complete the installation of the emergency lighting (III.J) during the first refueling outage commencing after August 17, 1981 for each unit.

By prior correspondence dated January 10, 1983 the licensee indicated lighting installation required a plant outage. Based on this, the staff advised the licensee by letter dated June 29, 1983 that completion of Appendix R, III.G items during the next refueling outage (the present ongoing outage) met the requirements of 10 CFR 50, Section 50.48(c)(3)(i) and (ii).

The licensee by letter dated July 5, 1984 stated that a plant shutdown is no longer considered necessary in order to implement the Subsection III.J requirements. Because of these changed circumstances, the statements made in the staff's letter of June 29, 1983 regarding the schedular requirements of 10 CFR 50.48(c)(3) are no longer valid. Under conditions described by the licensee's letter the schedular requirement for Subsection III.J is established in 10 CFR 50.48(c)(2). The subsection requires that the installation of emergency lighting be completed prior to the present outage.

2.1 Evaluation

On July 13, 1983 the licensee filed a supplemental report containing the results of additional evaluations of the fire protection features at IP-2. At that time, the need for additional battery-backed emergency lighting units was not fully specified although the licensee anticipated completion of any required installation during the 1984 refueling outage because of a potential

need for removing required power supplies from service. The lighting units were ordered early to have them available for installation.

Since then the licensee has fully developed the design package and has engineered the design so that its implementation does not require a plant outage. The licensee has concluded that post-outage installation is preferable because it results in major cost savings, not achievable during a refueling outage.

A total of 63 emergency lights are presently envisioned. Of this total 39 are presently installed or will be installed prior to plant startup. Therefore, the schedular exemption which was requested pertains to the 24 lights which will not be installed prior to plant startup, or those lights already installed which must be relocated due to the installation of new alternate shutdown equipment.

The licensee has proposed interim compensatory measures. Until such time as emergency lighting installation is completed and tests and walkdown has determined their adequacy the licensee will provide hand held battery lanterns for plant operator use.

Based on our consideration of these circumstances, we conclude that the licensee made proper application of available resources in a best effort to provide qualified lighting. However, the time allowed proved to be insufficient to permit full implementation. In addition, we have determined that as an interim compensatory measure the existing emergency lighting, although not fully in compliance with III.J and in conjunction with the portable lighting units that are available for use by the operators and

members of the fire brigade can provide emergency lighting as needed until the installation of the III.J units is achieved. On this basis the staff has judged that the request for exemption to allow additional time to complete the installation of the emergency lighting until three months from plant startup after completion of the present refueling outage be granted.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the Exemption will have no significant impact on the environment (49 FR 39252).

For further details with respect to this action, see (1) the request for Exemption dated January 10, 1983 and supplemented by letters dated July 13, July 29, and September 9, 1983, (2) the Commission's letter dated and (3) the Exemption. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the B. F. Jones Memorial Library, 663 Franklin Avenue , Aliquippa, Pennsylvania 15001. A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director Division of Licensing.

FOR THE NUCLEAR REGULATORY COMMISSION

Edson G. Case, Deputy Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 16th day of October 1984.

members of the fire brigade can provide emergency lighting as needed until the installation of the III.J units is achieved. On this basis the staff has judged that the request for exemption to allow additional time to complete the installation of the emergency lighting until three months from plant startup after completion of the present refueling outage be granted.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the Exemption will have no significant impact on the environment (49 FR 39252).

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FOR THE NUCLEAR REGULATORY COMMISSION

Edson G. Case, Deputy Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 16th day of October 1984.

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

| | | |
|---|---|---|
| In the matter of<br><br>CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.<br><br>(Indian Point Nuclear Generating Plant, Unit No. 2) | ) | Docket No. 50-247 |

## EXEMPTION

I.

The Consolidated Edison Company of New York (the licensee) is the holder of Facility Operating License No. DPR-26 which authorizes operation of the Indian Point Nuclear Generating Plant, Unit No. 2. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

The facility consists of one pressurized water reactor at the licensee's site located in Westchester County, New York.

II.

On November 19, 1980, the Commission published a revised Section 10 CFR 50.48 and a new Appendix R to 10 CFR 50 regarding fire protection feature of nuclear power plants (45 FR 76602). The revised Section 50.48 and Appendix R became effective on February 17, 1981. Section 50.48(c) established the schedules for satisfying the provisions of Appendix R. Section III of Appendix R contains fifteen 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 these fifteen subsections, III.G, III.J and III.O, are the subject of this exemption request. Technical exemptions are evaluated in the following Section 1.0 and the schedular exemption is discussed in Section 2.0.

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III.

1.0 Technical Exemptions

1.1 Introduction

By letter dated March 19, 1981, the licensee stated that Indian Point, Unit 2 was in full compliance with Appendix R, Sections III.G, III.J and III.O. In a subsequent meeting with the licensee, it became apparent that they may have misinterpreted certain fire protection requirements of Appendix R. We informed the licensee that compliance with Appendix R had to be assessed on the basis of valid fire areas and that where fire detectors and a fixed fire suppression system were required, these fire protection systems had to be provided throughout the fire area or their absence justified by approved exemptions.

By letter January 10, 1983, the license requested sixteen exemptions from the fire protection requirements of Sections III.G. and III.O of Appendix R. Subsequently by letter dated July 13, 1983 two additional exemptions were requested.

By letters dated July 13, July 29 and September 9, 1983, the licensee provided additional information, which included commitments to provide added fire protection in several areas.

In the September 9, 1983 letter, the licensee withdrew an exemption request which pertained to fire barriers, because potential deviations from Appendix R had been resolved by proposed modifications or other exemptions. Two exemption requests, HVAC exhaust fans and emergency lighting, are still under review.

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 with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or

(3) Enclosure of cable 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.

If these conditions are not met, Section III.G.3 requires an alternative shutdown capability independent of the room, or zone area, of concern. It also requires a fixed fire suppression system to 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 the design basis fire. Plant specific features may require protection different than 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 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 an alternative fire protection configuration must be justified by a fire hazard analysis.

Our general criteria for accepting an alternative fire protection configuration are the following:

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

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

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

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

1.2.0.1 Component Cooling Pump Room (Fire Zone 1)
1.2.0.2 Auxiliary Boiler Feed Pump Room (Fire Zone 23)

1.2.1 Exemption Requested

The licensee requested four exemptions from Section III.G.2.c to the extent that it requires the enclosure of cable and equipment of one redundant shutdown train in a fire barrier having a one-hour fire rating and the installation of an automatic fire suppression system where separation of redundant components is less than 20 feet.

1.2.2.1 Discussion (Component Cooling Pump Room)

The area is enclosed by walls constructed of reinforced concrete. The room perimeter wall separating this area from the remaining areas on elevation 68'-00" is a non-fire-rated partial height barrier, open at

the top. The floor is reinforced concrete, the ceiling is metal grating, with openings into an adjoining fire zone on elevation 80'-00".

The room contains the three component cooling water (CCW) pumps, at least one of which is required to achieve and maintain safe shutdown. The pumps are arranged parallel to each other, separated by 10 feet center to center. The room also contains power cables to the CCW pumps. The cables are separated by a maximum of 10 feet and a minimum of several inches.

To satisfy previous safety requirements, the licensee has provided hardwire connections and an alternate power feed for the CCW pumps to be powered from the IP-1 switchgear. This includes the routing of an alternate power cable to one of the pumps. The minimum separation between the alternate power cable and the normal power feeds is 10 feet.

The combustible material in the room consists of lube oil and transients estimated to represent a fire load of approximately 1,000 BTU's/sq. ft.

Existing fire protection consists of a smoke detector, which provides area-wide coverage; portable fire extinguishers and manual hose stations.

By letter dated September 9, 1983, the licensee proposed the following modifications:

- Wrap the power feed conduit from transfer switch (EDF-9) to CCW pump 23 motor with material that achieves a minimum 1/2-hour fire rating when tested in accordance with ASTM E-119.

- Erect a partial height non-combustible fire barrier between CCW pumps 22 and 23. The barrier will extend at least one foot beyond the width and height of the pump-motor assembly.

- Erect a non-combustible fire barrier behind transfer switch (ECF-9) which extends the width and height of the switch.

1.2.2.2 Discussion (Auxiliary Boiler Feed Pump Room)

The room is enclosed by concrete walls floor and ceiling. The outside access doors and the interior wall penetration seals to the adjoining fire zones are not fire rated.

The room contains the three auxiliary boiler feed pumps along with related cabling. One of the pumps is needed to achieve hot shutdown. In addition, the area contains two sets of regulator valves and associated control cable of the auxiliary boiler feedwater system. The cables are located at various heights below the ceiling. At least two valves in either set are needed for hot shutdown. Other shutdown related equipment in the room includes the remote shutdown panel that is used for operaton of the auxiliary feed pumps if the control room is evacuated.

The combustible material in the room consists of lube oil and quantities of transients estimated to represent a fire load of approximately 500 BTU's/sq. ft.

Existing fire protection consists of smoke detectors located throughout the room, portable fire extinguishers and fire hose from a yard hose house.

By letter dated September 9, 1983, the licensee proposed the following modifications:

- Wrap the conduits from ARF pump motor 23 box down to the floor level with material that achieves a minimum 1/2 hour fire rating when tested in accordance with ASTM E-119.

- Erect a partial height non-combustible fire barrier between AFW pumps 21 and 23 which extends approximately one foot beyond the width and height of the pump-motor assembly.

The licensee justifies the exemptions for both of these fire zones on the basis that the low fire load will limit the severity of a postulated fire and on the existing and proposed fire protection.

The licensee also employed an analytical method to demonstrate the inherent protection afforded to existing safe shutdown systems. The intent of this method was to demonstrate that compliance with Section III.G of Appendix R would not enhance the fire protection for safe shutdown.

1.2.3 Evaluation

The technical requirements of Section II.G are not met in these zones due to the absence of automatic fire suppression systems and one-hour fire barrier around one shutdown related division.

The licensee's analytical method, utilized to justify the exemptions, can be summarized as follows:

- The redundant cables of concern were identified.
- Their geometry and configuration within the fire area were described.
- The minimum quantity of flammable liquid needed to produce sufficient heat flux and heat energy to damage the cables were calculated, considering several heat transfer modes, i.e., radiation, plume impingement, and stratification.

The analysis determined that heat flux into the room needed to cause electrical failure of the redundant cables. This heat flux was converted to a quantity of flammable liquids, in a circular pool configuration.

We and our contractor Brookhaven National Laboratory have reviewed the analytical method. We determined that the results of the methodology, as applied, do not demonstrate the equivalence of the protection provided for safe shutdown systems to the specific alternatives set forth in Section III.G of Appendix R. For example:

- The method does not consider the heat release rate of a given fire when it occurs against a wall or in a corner; the method only considers the heat release of a fire as it occurs in an open area.

- The method does not consider the effects of excess pyrolyzate resulting from the degradation of plastics burning in the stratified layer.

- The method does not consider all of the alternatives set forth in Section III.G, i.e., 3-hour fire barrier, 1-hour fire barrier with suppression system, twenty-feet separation free of combustibles with automatic suppression and alternate or dedicated shutdown capability independent of the area. The method only considers separation without automatic suppression and uses a stratification model which does not include the effects of separation.

We have not relied upon the results of the licensee's analysis in our evaluation. We have evaluated the exemption request using our standard method of review as follows:

a. Review the information submitted and that existing in the docket file to determine the configuration of the redundant components,

b. Evaluate the existing fire protection, proposed modifications, and other compensating features or mitigating factors to determine the overall level of fire protection in the area of concern, and

c. Determine if the overall level of safety is equivalent to that provided by Section III.G of Appendix R.

We were concerned that because of the close proximity of redundant shutdown related components to each other and to the power cables of the licensee's alternate shutdown capability, a fire of significant magnitude may cause damage to redundant systems and thereby prevent the achievement and maintenance of safe shutdown conditions.

The fire load in these rooms is low. Combustible materials are widely dispersed. Because accessibility is limited in these locations, the quantity of transient combustibles that would be present at any point in time would not be large and would, therefore, not constitute a significant fire hazard. Consequently, if a fire were to occur, we would not expect it to be of significant magnitude or duration.

Because of the presence of smoke detectors in these rooms, a fire would be discovered in its initial stages before significant damage occurred. The fire brigade would then respond and would effect fire extinguishment using manual firefighting equipment. Until the fire brigade arrived, one shutdown related division would be protected by the fire barriers which the licensee proposes to install. The non-combustible, partial height barrier would protect the pump-motor assembly from radiant heat from a fire, while the 1/2-hour fire rated cable/conduit wrap will protect the shutdown-related circuits from radiant energy and elevated air temperatures. Therefore, no loss of safety function is expected.

1.2.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, with proposed modifications, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensees request for exemption for the Component Cooling Pump Room (Zone 1) and Auxiliary Boiler Feed Pump Room (Zone 23) should be granted.

1.3.0 Piping and Electrical Tunnel and Piping Penetration Area (Fire Zone 1A)

1.3.1 Exemption Requested

The licensee requested exemptions from Sections III.G.2.a, III.G.2.b, and III.G.3.b to the extent that they require the installation of an automatic fire suppression system, or the separation of redundant shutdown divisions by a 3-hour fire barrier.

1.3.2 Discussion

The area consists of an electrical tunnel, approximately 16 feet wide with a 10 foot ceiling, and a piping penetration area, approximately 60 by 60 feet with a 20-foot ceiling. The walls, floor and ceiling are of reinforced concrete construction. This area is open to several other fire zones. In addition, the 3-hour fire walls which separate this area from others have penetration seals which are not 3-hour rated.

Safety related systems located in the area consist of cabling, which represents the normal power supply for component cooling pumps, RHR pumps, charging pumps and control cables for the auxiliary feedwater pumps. The area also contains cabling associated with pressurizer power operated relief valves and block valves, steam generator secondary atmospheric relief valves and safe shutdown instrumentation. The cables are located at various heights below the ceiling. In addition to the normal shutdown systems, this fire zone contains pneumatic instrument lines for the alternate shutdown capability. The instrument lines are separated from the normal shutdown cabling by more than twenty feet with no intervening combustible material.

Combustible material located in this area consists of a small quantity of anticipated transients which the licensee has estimated to represent a fire load of 17 BTU/sq. ft.

Existing fire protection consists of a smoke detection system, portable fire extinguishers and manual hose stations.

By letter dated September 9, 1983, the licensee proposed the following modifications:

- Wrap the pneumatic instrument lines for the alternate shutdown capability with material that achieves a minimum 1/2 hour fire rating when tested in accordance with ASTM E-119.

- Seal all cable penetrations into adjoining fire Zone 74A.

- Upgrade the wall and floor/ceiling which separates this area from the fan house (Zone 59A) to be 3-hour fire rated, including penetrations and door.

The licensee justifies the exemption on the basis of the limited fire load; the existing and proposed fire protection; the ready access into the area for fire fighting; the availability of the tunnel vent fans for smoke exhaust; and the fire damage mitigating effects of the asbestos jacketed cable.

Evaluation

The technical requirements of Section III.G are not met in this fire zone due to the absence of a fixed fire suppression system. Also, some components of the licensee's alternate shutdown system are not independent of the fire zone.

We were concerned that if a fire of significant magnitude occurred in this area, it would damage normal shutdown related systems as well as the components of the alternate shutdown capability, since a one-our enclosure was not provided. We were also concerned that such a fire might propagate beyond the perimeter of this area into adjoining plant locations.

The upgrading of the perimeter walls and ceiling as described above will provide us with reasonable assurance that the damaging effects of a fire within the Piping/Electrical Tunnel will be confined within the area and would, therefore, not pose a threat to shutdown-related systems in other areas.

The pneumatic instrument lines for the alternate shutdown capability will be protected by a barrier that achieves a 1/2-hour rating when tested in accordance with ASTM E-119. Because of the limited amount of combustibles in the area and the exising automatic and manual fire protection, we do not expect a fire to develop the elevated temperatures comparable to the E-119 test fire. Therefore, the fire barrier for the instrument lines will be expected to maintain its integrity for a significantly longer period of time.

Because of the presence of smoke detectors, we expect a fire to be discovered in its initial stages before significant damage occurred. The fire brigade would then respond and would effect extinguishment using manual fire fighting equipment. During the time delay associated with these actions, the instrument

lines would be protected from damage by the fire barrier. Therefore, if redundant shutdown systems were damaged, the alternate shutdown capability would be available to achieve and maintain safe shutdown conditions.

1.3.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, with proposed modifications, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensees request for exemption for the Piping and Electrical Tunnel and Piping Penetration Area (Zone 1A) should be granted.

1.4.0 Containment Spray Pump Room and Primary Water Makeup Pump Room (Fire Zones 2/2A)

1.4.1 Exemption Requested

The licensee requested an exemption from Section III.G.3.b to the extent that it requires the installation of a fixed fire suppression system in an area for which an alternate shutdown system is provided.

1.4.2 Discussion

The two zones are contiguous and open to one another. They are bounded on two sides by reinforced concrete walls. The other sides are open to adjoining locations, identified as separate fire zones. The floor is reinforced concrete. The ceiling is part reinforced concrete, part steel grating which is open to a vertically adjoining fire zone.

The only safe shutdown components in these zones are the power cables to the component cooling water pumps.

In-situ and potential transient combustibles in this room include motor and pump lubricant and quantities of protective clothing estimated to represent a fire load of approximately 1,600 BTU/sq. ft.

Existing fire protection consists of smoke detectors located throughout the zones, portable fire extinguishers and manual hose stations.

The licensee has provided an alternate shutdown capability to the shutdown related cables which are located in these fire zones.

The licensee justifies the exemption on the basis that a fire in these zones would not affect the alternate shutdown capability. This is due to: the limited fire load; the existing fire protection; the asbestos jacketing of the power cables; the ready access to the area for manual fire fighting; and the separation between the normal shutdown cabling and the alternate shutdown system.

The licensee also employed an analytical method to demonstrate the inherent protection afforded to existing safe shutdown systems. The intent to this method was to demonstrate that compliance with Section III.G of Appendix R would not enhance the fire protection for safe shutdown.

1.4.3 Evaluation

The technical requirements of Section III.G are not met in these fire zones due to the absence of a fixed fire suppression system. In addition, the alternate shutdown system components are not separated from normal shutdown components by a fire rated barrier.

The fire load in these zones, including anticipated transients, is low. If totally consumed, the combustible materials would produce a fire which corresponds to a fire severity on the ASTM E-119 time temperature curve of approximately 2 minutes.

Due to the presence of the smoke detection system and the availability of adequate manual fire fighting equipment, the fire brigade would be expected to extinguish a postulated fire before significant damage occurred.

In the event that a fire damaged the normal shutdown components in these zones, the alternate shutdown capability could be relied upon to achieve and maintain safe shutdown conditions.

Although the alternate shutdown system components are not separate from the normal shutdown components by a rated fire wall, there is reasonable assurance that they would not be damaged by a fire in these zones since they are either located on a different floor level and well away from an anticipated fire and smoke plume, or they are shielded by a partial height concrete wall. The top of the wall does not extend to the ceiling but hot gases which would accumulate at the ceiling would be dissipated harmlessly in the horizontal direction to adjoining zones or vertically through the steel grating which forms part of the ceiling.

1.4.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensee's request for exemption for the Containment Spray Pump Room and Primary Water Makeup Pump Room (Zones 2/2A) should be granted.

1.5.0.1 Charging Pump Room (Fire zone 5)

1.5.0.2 Corridor (Fire Zone 7a)

The licensee requested an exemption from Section III.G.2.a to the extent that it requires a fire rated barrier between alternate shutdown system components and normal shutdown components. The licensee also requested an exemption (Zone 5) from Section III.G.3.b to the extent that it requires the installation of a fixed fire suppression system in an area where an alternate shutdown system is provided.

1.5.2.1 Discussion (Charging Pump Room)

The room is bounded by reinforced concrete walls, floor and ceiling. However, certain wall penetrations are not provided with fire rated penetration seals. In addition, the room is open, via an unprotected doorway, to the adjoining corridor which is designated as a separate fire zone.

The room contains one of three charging pumps and the associated cabling to all three charging pumps. The licensee has provided an alternate shutdown system for the pump and cables in this room. Components for this alternate system are located approximately 24 feet away from the entrance to this room, in the adjoining corridor.

In-situ and potential transient combustibles in the room include lube oil, hydraulic fluid and ordinary combustibles such as paper, wood and plastic associated with maintenance operations. These were estimated to represent a fire load of over 18,000 BTU/sq. ft.

Existing fire protection consists of a ceiling mounted smoke detection system providing area-wide coverage, manual hose stations and portable fire extinguishers.

1.5.2.2 Discussion (Corridor)

This fire zone is a large open area on elevation 80'-00" of the Primary Auxiliary Building. It is bounded, in part, by concrete internal walls and metal sandwich panel external walls. The floor and ceiling are part concrete, part steel grating. This zone is open both horizontally and vertically with a number of contiguous plant areas which are identified as separate fire zones.

The zone contains cabling and transfer switches associated with the alternate shutdown capability, i.e., an alternate power supply to one

charging pump, component cooling pump, safety injection pump and RHR pump. Components of the normal shutdown systems are, in part, located in adjacent fire zones. The normal shutdown components are not completely separated from the alternate systems by fire rated construction.

The in-situ potential transient combustibles in this area consist of lube oil, protective clothing and some combustible cable insulation which is estimated to represent a fire load of approximately 200 BTU/sq. ft.

Existing fire protection consists of several smoke detection devices, portable fire extinguishers and manual hose stations.

By letter dated September 9, 1983, the licensee proposed the following modifications:

- Install additional smoke detectors in the corridor to comply with the location and spacing requirements of NFPA-72E

- Install a 1 1/2-hour rated fire door in the doorway between the charging pump room and corridor and to seal all openings in the common wall between these areas to prevent the propagation of fire.

The licensee justifies the exemptions in these two zones on the basis of the low fire load, the ease of access for manual fire fighting activity, the existing and proposed fire protection.

The licensee also employed an analytical method for fire Zone No. 5 to demonstrate the inherent protection afforded to existing safe shutdown systems. The intent of this method was to demonstrate that compliance with Section III.G of Appendix R would not enhance the fire protection for safe shutdown.

1.5.3 Evaluation

The technical requirements of Section III.G are not met in these fire zones due to the absence of fixed fire suppression systems and because the alternate shutdown capability is not separated by a fire barrier from the fire area in which the normal shutdown capability is located.

For the reasons previously stated in Section II of this SER, the licensee's analytical method has not demonstrated the equivalence of the existing fire protection provided for safe shutdown sytems to the specific alternatives set forth in Section III.G of Appendix R.

We were concerned that if a fire occurred in the common boundary area of these two zones, components for both the normal and alternate shutdown capability would be damaged.

The charging pump room is bounded by concrete walls, with all penetrations in the common wall with the corridor sealed to prevent fire propagation. A fire door will be installed in the doorway so as to preclude the passage of flame and hot gases. Therefore, we have reasonable assurance that if a fire occurred in either area, no significant damage would be sustained in the other zone.

The fire load in these zones is low. Because accessibility is limited in these locations, the quantity of transient combustibles that would be present at any point in time would not be large and would, therefore, not constitute a significant fire hazard. Consequently, we do not expect a fire of considerable magnitude or duration to occur. Because of the presence of the smoke detectors in these areas, a fire would be detected in its initial stages before significant damage occurred. If such a fire damaged shutdown related systems before the arrival of the plant fire brigade, an alternate capability exists to achieve safe shutdown, which is physically and electrically independent of the fire area. Therefore, an automatic fire suppression system is not necessary to assure that one shutdown division will be free of fire damage.

1.5.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, with proposed modifications will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensee's request for exemptions for the Charging Pump Rooms (Zone 5) and Corridor (Zone 7A) should be granted.

1.6.0 Waste Storage and Drumming Station (Fire Zone 6A)

1.6.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.G.2.a to the extent that it requires the separation of components of redundant shutdown trains by a 3-hour fire rated barrier. The licensee also requested an exemption from Section III.G.3.b to the extent that it requires the installation of a fixed fire suppression system in an area where an alternate shutdown system is installed.

1.6.2 Discussion

The area is enclosed by walls, floor, and ceiling of reinforced concrete construction. However, certain cable penetrations of the walls are not provided with approved fire rated penetration seals. The entrance to this area is equipped with a concrete filled, steel clad door that was installed to provide radiation shielding. The door is normally closed.

The area contains the normal power supply cables to all three charging pumps. The licensee has provided an alternate shutdown system for the vulnerable cables. Components for this alternate system are located approximately 8 feet from the entrance to this area, in an adjoining fire zone.

The only combustibles present are transient tube materials that are brought into the area prior to bailing and drumming. The licensee has estimated that this represents a fire load of approximately 300 BTU/sq. ft.

Existing fire protection consists of portables fire extinguishers and manual hose stations. The licensee proposes to install a ceiling mounted smoke detection system which will provide area-wide coverage, and to seal all cable penetrations with a listed, fire rated material. The licensee justifies the exemptions on the basis that the limited fire loading, coupled with a proposed early warning fire detection system and room perimeter construction will limit fire damage. In addition, if damage to all three pump power cables occurred, an alternate shutdown capability exists outside of the fire zone.

1.6.3 Evaluation

The technical requirements of Section III.G are not met in this area because of the absence of a fixed fire suppression system. In addition, the door providing radiation shielding is not a listed 3-hour fire rated door assembly.

The fire load in this area is low. If totally consumed, the combustible material would produce a fire which corresponds to a fire severity on the ASTM E-119 time temperature curve of a fraction of a minute. Due to the presence of a smoke detection system and readily accessible manual fire fighting equipment, the plant fire brigade would be able to extinguish a postulated fire before significant damage occurred.

Although the door into the room is not a listed assembly, it is of substantial construction and is normally closed. The nature of the door, considered in conjunction with the limited fire load, is such as to provide us with reasonable assurance that smoke and heat from a fire would be confined within the room until the fire brigade arrived.

If fire damage were to be sustained by all three charging pump power cables, an alternate power supply to one of the charging pumps is available. Components to this alternate capability are located outside this area and would not likely be affected by the same fire.

1.6.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensee's request for exemption for the Waste Storage and Drumming Station should be granted.

1.7.0.1 Valve Room & Stairwell (Fire Zone 13A)

1.7.0.2 Valve Room & Corridors (Fire Zone 18A and 3A)

The licensee requested an exemption from the technical requirements of Section III.G.3.b to the extent that it requires the installation of a fixed fire suppression system and a fire detection system in an area where an alternate shutdown system has been provided. The licensee also requested an exemption for Zones 18A and 3A from the requirements of Section III.G.2.a to the extent that it requires the separation of cables and equipment of redundant shutdown divisions by a 3-hour fire rated barrier.

1.7.2.1 Discussion (Valve Room and Stairwell)

The zone is enclosed, in part, by walls, floor, and ceiling of reinforced concrete construction. It is open both horizontally and vertically to adjoining plant areas which are designated as separate fire zones.

The only redundant shutdown related components in the zone are cables for the normal power supplies for the two RHR pumps which are located at various heights below the ceiling. The licensee has provided an alternate power supply to one of the pumps. Components for this alternate capability are located either outside the building or on different floor elevations from this zone.

In-situ and transient combustibles in the area include lube oil contaminated equipment and protective clothing estimated to represent a fire load of approximately 380 BTU/sq. ft.

Existing fire protection consists of portable fire extinguishers and manual hose stations. Smoke detectors are located in adjoining zones.

1.7.2.2 Discussion (Valve Room and Corridors)

The zone is enclosed, in part, by concrete walls, floor and ceiling. It is open both horizontally and vertically to adjoining plant areas which are designated as separate fire zones. One of the walls contains unsealed pipe penetrations. However, by letter dated January 10, 1983, the licensee has proposed to seal them with a listed fire rated material. The only redundant shutdown related components in the zone are the cables for the normal power supplies for the two RHR pumps which are located at various heights below the ceiling. The licensee has provided an alternate power supply to one of the pumps.

Components for this alternate capability are located, for the most part, either outside the building or at different floor elevations. However, both RHR pumps and their normal and alternate power supplies are located on the same floor elevation as the corridor (zone 3A) in adjoining fire zones. These zones are open to one another via unprotected doorways.

The only combustibles in the zones are transients such as contaminated equipment and clothing and lube oil associated with maintenance operations. These were estimated to represent a fire load of approximately 1,200 BTU/sq. ft.

Existing fire protection consists of manual hose stations and portable fire extinguishers. Smoke detectors are located in adjoining zones.

By letter dated September 9, 1983, the licensee proposed to install a 1 1/2-hour rated fire door in the doorway in the common wall between RHR-21 pump room (Zone 4) and the subject fire zones. The licensee also committed to seal the openings in this wall to prevent fire propagation.

The licensee justifies the exemptions for these zones on the basis of the low fire load, the existing protection and the proposed modifications.

The licensee also employed an analytical method in fire zone 13A to demonstrate the inherent protection afforded to existing safe shutdown systems. The intent of this method was to demonstrate that compliance with Section III.G of Appendix R would not enhance the fire protection for safe shutdown.

1.7.3 Evaluation

The technical requirements of Section III.G are not met in these two zones because of the lack of smoke detection and fixed fire suppression systems. In addition, components of the alternate shutdown system are not separated from the normal shutdown systems by a rated fire barrier.

As we previously stated in Section 2 of this SER, the licensee's analytical method has not demonstrated the equivalence of the existing fire protection provided for safe shutdown systems to the specific alternatives set forth in Section III.G of Appendix R.

We were concerned that if a fire occurred on elevation 15 feet, in the vicinity of the common wall between the RHR pump area and the corridor and stairwell, damage would occur to both normal and alternate shutdown related systems.

The RHR pump area is bounded by concrete walls, with all penetrations in the common wall with the corridor and stairwell sealed to prevent fire propagation. A fire door will be installed in the doorway so as to preclude the passage of flame and hot gases. Therefore, we have reasonable assurance that if a fire occurred in either the RHR area or the subject fire zones, no significant damage would be sustained in the other location.

The fire load in these zones is low. Because accessibility is limited in these locations, the quantity of transient combustibles that would be present at any point in time would not be large and would, therefore, not constitute a significant fire hazard. Consequently, we do not expect a fire of considerable magnitude or duration to occur. Because of the presence of fire detection in adjoining plant locations, a fire would be detected in its initial stages before significant damage occurred. If such a fire damaged shutdown-related systems before the arrival of the fire brigade, an alternate capability exists to achieve safe shutdown which is physically and electrically independent of the fire area. Therefore, an automatic fire suppression system is not necessary to assure that one shutdown division will be free of fire damage.

1.7.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, with proposed modifications, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensees request for exemption for the Valve Room & Stairwell (Zone 13A) and Valve Room & Corridors (Zones 18A and 3A) should be granted.

1.8.0 Switchgear Room (Fire Zone 14)

1.8.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.G.3.b to the extent that it requires the installation of a fixed fire suppression system in a fire area where an alternate shutdown system is provided.

1.8.2 Discussion

The room is bounded on three sides by walls of concrete or masonry construction. The wall on the fourth side is of built-up, metal sandwich, insulated panels. The floor is concrete, the ceiling is concrete on steel frame.

The switchgear room contains the safety related 480V switchgear that provides the normal power supply to safe shutdown components in the plant, such as charging pumps, SI pumps, component cooling pumps, motor driven auxiliary feedwater pumps, service water pumps and RHR pumps. The licensee has provided an alternate shutdown capability for the safety related systems in this room. This capability is electrically and physically independent of the switchgear room.

The principal fire hazard consists of anticipated transient combustible materials, which were estimated to represent a fire load of approximately 3,300 BTU/sq. ft.

Existing fire protection consists of a ceiling level fire detection system which provides area-wide coverage, portable fire extinguishers and manual hose stations.

The licensee justifies the exemption on the basis that the existing fire load, perimeter wall construction and early warning fire detection system will limit fire damage to the switchgear room. The alternate shutdown system which is independent of the room will be available to achieve safe shutdown. In addition, the inadvertent actuation of the fixed fire suppression system may increase the potential for damage to sensitive electronic components.

1.8.3 Evaluation

The technical requirements of Section III.G are not met in this room due to the absence of an fixed fire suppression system.

Because of the nature of the fire hazard and the presence of the fire detection system, the fire brigade would not be confronted with conditions that would be beyond their capabilities to deal with. Therefore, the installation of a fixed fire suppression system would not enhance the existing fire protection.

In the event that damage was sustained by redundant shutdown systems in the room. the licensee would be able to rely upon an alternate shutdown capability to achieve and maintain safe shutdown conditions.

1.8.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensees request for exemption for the Switchgear Room should be granted.

1.9.0 Control Room (Fire Zone 15)

1.9.1 Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.2.a to the extent that it requires the separation of cables and equipment of redundant shutdown trains by a 3-hour fire rated barrier. The licensee also requested an exemption from the requirement of Section III.G.3.b to the extent that it requires the installation of a fixed fire suppression system in an area for which an alternate shutdown system is provided.

1.9.2 Discussion

The room is bounded on three sides by walls constructed of metal sandwich panels and 8"-12" thick masonry. The fourth side is open to the IP-Unit 1 control room. The floor is concrete on exposed steel and the ceiling is metal deck. However, cable penetrations of the floor slab are not completely sealed with fire rated material.

The control room contains controls and logic for all systems that would normally be relied upon to achieve and maintain safe shutdown of the plant. The licensee has provided an alternate shutdown capability for the sytems in the control room. Components for this alternate capability are located in the IP-1 Superheater Building which is separated from the IP-1/IP-2 control rooms by non-fire rated bullet proof walls and doors. The fire hazard in the zone is represented by a small amount of ordinary combustibles such as paper, which were estimated to represent a fire load of approximately 270 BTU/sq. ft.

Existing fire protection consists of smoke detectors located in the supervisory panels and in the flight panels, portable fire extinguishers and manual hose stations.

By letter dated September 9, 1983, the licensee proposed to upgrade the protection for penetrations of the concrete floor slab. The penetrations will be sealed with a material that achieves a 3-hour fire rating.

The licensee justifies the exemptions on the basis of the low fire loading, the constant manning of the control room, the existing and proposed fire protection, and the availability of an alternate shutdown capability

1.9.3 Evaluation

The technical requirements of Section III.G are not met in the control room because of the absence of a fixed fire suppression. In addition, the alternate shutdown system components in the IP-1 Superheater Building are not separated from the normal shutdown systems in the control room by a rated fire barrier. Also, the smoke detection system has not been installed throughout the area.

We were concerned that the control room was not an independent fire area. Thus, a fire which originated either within the room or outside of it could damage components for both the normal and alternate shutdown capability.

Combustible materials within the control room are limited. A fire, if one should occur, would be of limited magnitude and duration. Because of the presence of smoke detectors within the control panels and because the room is constantly manned, we expect the fire to be discovered early before significant damage occurred. It would then be extinguished by the control room operators or the fire brigade using portable fire fighting equipment. We, therefore, have reasonable assurance that the effects of a fire which originated within the control room would be limited to that area. If components for redundant shutdown divisions were damaged by such a fire, an alternate shutdown capability exists which is physically and electrically isolated from the control room. Therefore, complete area-wide, automatic fire suppression and detection systems are not necessary to assure that safe shutdown conditions can be achieved and maintained.

We were concerned that if a fire originated below the control room or in the adjoining IP-1 Superheater Building, significant fire damage would occur to the control room. Penetrations of the concrete floor slab will be sealed with 3-hour fire rated material.. This will provide us with reasonable assurance that flame and hot gases will not rise into the control room to a significant extent.

The common wall with the IP-1 superheater Building is partly of 3-hour fire-rated, construction. The remaining portion of the wall is of multi-course brick and steel construction.

Cable tray, conduit and ventilation openings are sealed to prevent fire propagation. Within the control room perimeter walls are a non-fire rated door and an observation window. At this location, the control room perimeter is formed by a double wall of multi-course brick and steel construction. The double wall configuration compensates for the non-fire rated door and window.

The fire hazards in the Superheater Building varies. Those locations where a significant fire hazard exists, such as the pump vault and portions of the Technical Support Center, are protected by automatic fire suppression systems. Where no automatic fire suppression capability exists, a postulated fire would be within the capabilities of the plant fire brigade to extinguish, using portable fire fighting equipment, before safe shutdown is jeopardized. It is therefore our judgment that the existing walls separating the control room from the Superheater Building would prevent significant damage to the control room until the fire was extinguished. Therefore, complete 3-hour fire rated walls are not necessary to assure that safe shutdown can be achieved and maintained.

1.9.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, with proposed modifications, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensee's request for exemption for the Control Room (Zone 15) should be granted.

1.10.0 Screen Well Area (Fire Zone 22)

1.10.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.G.2.c to the extent that it requires the enclosure of cable and equipment of one shutdown division in a 1-hour fire barrier and the installation of an automatic fire suppression system and fire detectors where redundant shutdown divisions are separated by less than 20 feet, free of intervening combustibles.

1.10.2 Discussion

The fire zone is an unenclosed outdoor area. It is located adjacent to the area containing the six circulating water pumps, which is a separate fire zone. It contains the six service water pumps, at least one of which is needed for hot shutdown. The pumps are arranged in a triangular configuration with the two farthest pumps being 16 feet apart at the centerline. The pump motors are located about 11 feet apart, center-to-center. The power cables for the service water pump motors are routed underground to a point adjacent to the pump motor and then routed vertically to the connection box.

The only in-situ combustible in this zone would be lube oil, which amounts to less than one-half gallon per pump. The anticipated transient combustibles are approximately 2 gallons of lube oil for pump servicing.

Existing fire protection consists of a yard hose house which is located approximately 25 feet from the zone. In addition, the area is under the general observation of a continuously manned guard house which is located approximately 90 feet away.

The licensee justifies the exemption on the basis that because of the outdoor location, limited fire loading and observation from the guard house, a fire in this location would not be of such a nature as to damage all of the pumps. At least one would remain operable.

1.10.3 Evaluation

The technical requirements of Section III.G are not met in this zone because the service water pumps are not separated by more than 20 feet without intervening combustible materials and the area is not equipped with automatic fire suppression and fire detection systems.

The level of fire protection required by Appendix R is intended to provide reasonable assurance that at least one shutdown division will remain free of fire damage.

The fire load in this zone is low. If the in-situ and anticipated transient combustibles ignited and were totally consumed, they would produce a fire which corresponds to a fire severity on the ASTM E-119 time temperature curve of a fraction of a minute. In addition, because of the traffic patterns, area layout and arrangement of the service water pumps, the potential for the accumulation or presence of unanticipated combustible materials is inconsequential.

Because this is an outdoor area, any effects of a postulated fire in the zone would be mitigated. Smoke and hot gases would be quickly dissipated. Because of the limited quantity and nature of combustibles in the area, radiant heat, which would normally be of concern with close-spaced components, would not be a significant factor.

An added consideration is the presence of the continually manned guard house in the area. This provides us with reasonable assurance that a significant fire in the area would be quickly discovered and the fire brigade summoned.

The openness of the area and the arrangement of the pumps provide ease of access for manual fire fighting operations. It is, therefore, our conclusion that the existing level of fire safety is sufficient to assure that at least one of the service water pumps will remain free of fire damage.

1.10.4 Conclusion

Based on our evaluation, we conclude that the licensee's present fire protection program will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensee's request for exemption for the Screen Well Area should be granted.

## 1.11.0 Electrical Penetration Area (Fire Zone 74A)

### 1.11.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.G.3.b to the extent that it requires the installation of a fixed fire suppression system in a fire area where an alternate shutdown capability is provided.

### 1.11.2 Discussion

The fire zone is an irregularly shaped, four sided area. It is bounded by walls, floor and ceiling of concrete construction. However, there is an unprotected opening into the Piping Penetration Area which is a separate fire zone.

The area contains cabling associated with the four channels of instrumentation providing indication in the control room. The licensee has provided instrumentation associated with the alternate shutdown capability. This instrumentation is located in the Piping Penetration Area.

In addition, the zone contains control cables for the auxiliary boiler feed pumps. However, these valves can be operated locally from the auxiliary boiler feed pump room if the control cables were damaged by fire. The control cables for the atmosphere relief valves are also in the zone but these would only be required for cold shutdown and could be operated locally using the all pneumatic control system that is physically independent, (i.e., separated by 3-hour fire barriers) from this zone. Cables are located at various distances below the ceiling.

The only combustible material present is the non-asbestos jacketed cable insulation. Transient combustibles include those materials that would be brought in to support penetration modifications, cable splicing and other work. The combined fire load would be little more than 50 BTU/sq. ft.

Existing fire protection consists of a smoke detection system, which provides area-wide coverage, and a manual hose station.

By letter dated September 9, 1983, the licensee proposed to seal all cable penetration openings in the common wall with the piping penetration area with a fire rated material to prevent fire propagation.

The licensee justifies the exemption of the basis of the limited fire hazard in the zone, the limited number of redundant systems involved, the ready access for fire fighting and the existing and proposed fire protection.

The licensee also employed an analytical method to demonstrate the inherent protection afforded to existing safe shutdown systems. The intent of this method was to demonstrate that compliance with Section III.G of Appendix R would not enhance the fire protection for safe shutdown.

1.11.3 Evaluation

The technical requirements of Section III.G have not been met in this zone due to the absence of a fixed fire suppression system.

For the reasons previously stated in Section 2 of this SER, the licensee's analytical method has not demonstrated the equivalence of the existing fire protection provided for safe shutdown systems to the specific alternatives set forth in Section III.G of Appendix R.

We were concerned that if a fire of significant magnitude occurred, it would propagate through unprotected openings in the common wall between the electrical and piping penetration areas and cause damage to components for both normal and alternate shutdown systems. The common wall is of concrete construction and all openings will be protected to prevent the passage of flame and hot gases. Therefore, we have reasonable assurance that if a fire occurred in the electrical penetration area, the systems for the alternate shutdown capability will be free of fire damage.

Because the fire load is low and the area is equipped with a smoke detection system, we expect the fire brigade to respond and effect fire extinguishment before serious damage occurs. If a fire should cause damage to redundant shutdown systems in the area, an alternate capability exists which is physically and electrically independent of the area. Therefore, an automatic fire suppression system is not necessary to assure that safe shutdown conditions can be achieved and maintained.

1.11.4 Conclusion

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration, with proposed modification, will achieve an acceptable level of fire protection equivalent to that provided by Section III.G. Therefore, the licensee's request for exemption for the Electrical Penetration Area (Zone 74A) should be granted.

1.12.0 Yard Manhole No. 21

1.12.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.G.2.c to the extent that it requires the enclosure of cable and equipment of one shutdown division in a one-hour fire rated barrier and the installation of automatic fire suppression and fire detection systems where the separation of redundant shutdown systems is less than 20 feet, free of intervening combustibles.

1.12.2 Discussion

This zone is a yard manhole that is approximately four feet square by six feet high. It has concrete walls with a gravel floor and a steel manhole cover. The manhole is normally closed and would only be accessed for maintenance or modification operations.

The manhole contains the normal power feeds to four of the service water pumps the normal power feed to two transfer switches which supply service water pumps 23 and 24, and the power feeds from these transfer switches to service water pumps 23 and 24. Loss of all cables in the manhole should result in loss of all service water capability. For hot shutdown, service water is required for cooling of component cooling water heat exchangers; for cold shutdown, service water would also be required for cooling of the CCW heat exchangers. At least one service water pump is needed for accomplishing these functions. However, at least one pump on each header needs to be preserved so that the header that is designated and aligned for nuclear services is available following a fire. The power cables are presently only separated by several inches. The power cables for these pumps are either asbestos jacketed cables with silicone insulation, or cross linked polyethylene insulated cable qualified to IEEE-383.

The manhole contains no combustibles other than the non-asbestos jacketed cable insulation. Accumulation of transient combustibles is not anticipated due to limited access to this area.

There is, presently, no fire protection within the manhole. However, by letter dated September 9, 1983, the licensee proposed to completely fill the manhole with sand, so that no cables are exposed. In the interim, a continuous fire watch will be posted at the manhole at all times that work is being performed in this zone until the fire barrier is installed.

Additional fire protection for the area includes yard hose houses and a continuously manned guard house, which is located approximately 50 feet away. The licensee justifies the exemption on the basis that because of the negligible fire hazard in the manhole, a fire would not likely occur or would be of insignificant magnitude. In addition, the existing fire protection (continuous oversight and manual fire fighting equipment) and proposed fire barrier are sufficient to assure the availability of a post-fire safe shutdown capability.

1.12.3 Evaluation

The technical requirements of Section III.G are not met in this zone due to the absence of a smoke detection and an automatic fire suppression system. In addition, redundant shutdown-related cables are not separated by 20 feet without intervening combustibles.

The only significant fire scenario that could be postulated to occur at the manhole is a flammable liquid spill with ignition. The use of a sand filler to "bury" the vulnerable cables represents an acceptable level of fire protection to assure that the cable is free of damage until the arrival of the fire brigade or until the fire burns itself out. Because of the limited access to the manhole and the limited amount of combustible materials within it, the installation of a fire detection and suppression system would not significantly enhance the level of fire safety beyond that achieved by the licensee's proposed protection.

1.12.4 Conclusion

Based on our evaluation, we conclude that the licensee's proposed fire protection configuration will achieve an acceptable level of fire protection equivalent to that provided by the technical requirements of Section III.G. Therefore, the licensee's request for exemption for Yard Manhole No. 21 should be granted.

1.13.0 Several Fire Zones

1.13.1 Discussion

The licensee originally requested exemptions from the technical requirements of Section III.G.2.a to the extent that it requires the separation of cables and equipment of redundant trains by a 3-hour fire rated barrier in several plant locations.

By letter dated September 9, 1983, the licensee withdrew these exemptions because potential deviations from Section III.G have been resolved by the implementation of fire protection plant modifications or through other requested exemptions.

1.14.0 Reactor Coolant Pump Oil Collection System Holding Tanks

1.14.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.O to the extent that it requires that the RCP oil collection system holding tanks be of such size or to be able to contain the entire lube oil inventory of all four RCP pumps simultaneously.

1.14.2 Discussion

There are four reactor coolant pumps, each with an lube oil inventory of 250 gallons.

The collection system consists of leakproof pans with covers under oil bearing components to contain oil from leaks in pressurized lines and to keep foreign matter out of the drains. The oil bearing components that are enclosed are:

- Oil lift pumps (pressurized lines)
- Oil cooler (pressurized lines and housing)
- Oil level indicators
- Oil fill and drain points
- Flanged connections for lower oil reservoir
- Sight glasses
- All flanged oil system connections

Each of the oil collection enclosures are connected to a header with a flexible hose; the header pipe drains the oil to 275 gallons capacity drain tank below the enclosures. The drain tank (1 tank for 2 pumps) is sized to contain the maximum amount of oil that could be lost from the failure of a single oil bearing component (250 gallons). The tank is equipped with a drain and a vent with a flame arrestor. Also, the tank and drain piping are seismically supported to preclude their failure during a seismic event which could potentially affect any safety-related equipment. The tanks are located so that the collection system can also be used for routine draining of the oil for maintenance purposes.

The licensee justifies the exemption on the basis that the seismic design of the RCP motor lube oil system will provide reasonable assurance that it can withstand earthquake conditions without failure. Therefore, the installation of additional oil storage capacity will not significantly increase the level of fire safety.

1.14.3 Evaluation

The technical requirements of Section III.O are not met because the existing holding tanks for the RCP oil collection system will not hold the entire lube oil system inventory.

In our original evaluation of this system the SER, we expressed concern that an unmitgated fire involving lube oil could damage safety related equipment in the vicinity. Consequently, the licensee agreed to improve the oil collection system to provide a capability for collecting leakage from vulnerable components. By letter dated June 6, 1980, the licensee submitted details of these improvements, which we approved as meeting our concerns.

Because the existing RCP motor lube oil system is capable of withstanding design basis earthquake conditions, only random oil leakage is anticipated, such as that which may occur at pipe joints. Small quantities of the lube oil might be ignited by hot surfaces. However, because of the limited

quantity of escaping oil, the resulting fire, if one should occur, would represent no significant fire hazard or otherwise endanger safety related equipment. Additional modifications to satisfy the requirements of Appendix R would not significantly enhance the level of fire safety. It is therefore our conclusion that our initial assessment as to the adequacy of the oil collection system is still valid.

1.14.4 Conclusion

Based on our evaluation, we conclude that the licensee's present fire protection configuration will achieve an acceptable level of fire protection equivalent to that provided by Section III.O. Therefore, the licensees request for exemption for the RCP Oil Collection System Holding Tanks should be granted.

1.15.0 Summary

Based on our evaluation, we find 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 these areas should be granted:

1. Containment Spray Pump Room and Primary Water Makeup Pump Room (Fire Zones 2/2A)
2. Waste Storage and Drumming Station (Zone 6A)
3. Switchgear Room (Zone 14)
4. Screen Well Area (Zone 22)
5. Yard Manhole No. 21.
6. Reactor Coolant Pump - Oil Collection Tanks
7. Component Cooling Pump Room (Zone 1)
8. Auxiliary Boiler Feed Pump Room (Zone 23)
9. Piping and Electrical Tunnel, Piping Penetration Area (Zone 1A)
10. Charging Pump Room (Zone 5)
11. Corridor (Zone 7A)

12. Valve Room and Stairwell (Zone 13A)
13. Control Room (Zone 15)
14. Valve Room and Corridor (Zones 18A and 3A)
15. Electrical Penetration Area (Zone 74A)

2.0 Schedular Exemption

2.1 Introduction

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

Section 50.48(c) requires completion of all modifications to meet the provisions of Appendix R within a specified time from the effective date of this fire protection rule, February 17, 1981, except for modifications to provide alternative safe shutdown capability.

By letter dated July 5, 1984 the Consolidated Edison Company requested an exemption from 10 CFR 50.48(c) with respect to the requirements of Subsection III.J of Appendix R as follows:

"Requests a schedule exemption of up to three (3) months after startup from the current refueling outage to allow sufficient time to complete the installation of the additional battery backed emergency lighting units, and for performing the field test/walkdown to verify their adequacy."

Section 50.48(c)(3) specifies the installation schedule of those fire protection features such as emergency lighting (III.J) that require a plant shutdown to complete the installation. The installation schedule in Section 50.48(c)(3) requires the completion of the installation of such fire protection features during the first refueling outage commencing after 180 days from the effective date of Appendix R (February 17, 1981). Hence, Section 50.48(c)(3) requires the licensee to complete the installation of the emergency lighting (III.J) during the first refueling outage commencing after August 17, 1981 for each unit.

By prior correspondence dated January 10, 1983 the licensee indicated lighting installation required a plant outage. Based on this, the staff advised the licensee by letter dated June 29, 1983 that completion of Appendix R, III.G items during the next refueling outage (the present ongoing outage) met the requirements of 10 CFR 50, Section 50.48(c)(3)(i) and (ii).

The licensee by letter dated July 5, 1984 stated that a plant shutdown is no longer considered necessary in order to implement the Subsection III.J requirements. Because of these changed circumstances, the statements made in the staff's letter of June 29, 1983 regarding the schedular requirements of 10.CFR 50.48(c)(3) are no longer valid. Under conditions described by the licensee's letter the schedular requirement for Subsection III.J is established in 10 CFR 50.48(c)(2). The subsection requires that the installation of emergency lighting be completed prior to the present outage.

2.1 Evaluation

On July 13, 1983 the licensee filed a supplemental report containing the results of additional evaluations of the fire protection features at IP-2. At that time, the need for additional battery-backed emergency lighting units was not fully specified although the licensee anticipated completion of any

required installation during the 1984 refueling outage because of a potential need for removing required power supplies from service. The lighting units were ordered early to have them available for installation.

Since then the licensee has fully developed the design package and has engineered the design so that its implementation does not require a plant outage. The licensee has concluded that post-outage installation is preferable because it results in major cost savings, not achievable during a refueling outage.

A total of 63 emergency lights are presently envisioned. Of this total 39 are presently installed or will be installed prior to plant startup. Therefore, the schedular exemption which was requested pertains to the 24 lights which will not be installed prior to plant startup, or those lights already installed which must be relocated due to the installation of new alternate shutdown equipment.

The licensee has proposed interim compensatory measures. Until such time as emergency lighting installation is completed and tests and walkdown has determined their adequacy the licensee will provide hand held battery lanterns for plant operator use.

Based on our consideration of these circumstances, we conclude that the licensee made proper application of available resources in a best effort to provide qualified lighting. However, the time allowed proved to be insufficient to permit full implementation. In addition, we have determined that as an interim compensatory measure the existing emergency lighting, although not fully in compliance with III.J and in conjunction with the portable lighting units that are available for use by the operators and members of the fire brigade can provide emergency lighting as needed until the installation of the III.J units is achieved. On this basis the staff has judged that the request for exemption to allow additional time to complete

the installation of the emergency lighting until three months from plant startup after completion of the present refueling outage be granted.

IV.

Accordingly, the Commisison has determined that pursuant to 10 CFR 50.12, these technical exemptions are authorized by law and will not endanger life or property or the common defense and security, and are otherwise in the public interest. The Commission hereby approves the requested exemptions from Appendix R of 10 CFR 50 Sections III.G.2 and III.G.3.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, a schedular exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest and hereby grants the following exemptions with respect to the requirements of Subsection III.J of Appendix R to 10 CFR 50:

Extend the implementation date in paragraph (c)(2) for installation of modifications required by Appendix R, Subsection III.J that do not require prior NRC approval or plant shutdown, until three months from plant startup after completion of the present refueling outage.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the exemption will have no significant impact on the environment (49 FR 39252).

FOR THE NUCLEAR REGULATORY COMMISSION

Edson G. Case, Deputy Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 16th day of October 1984