August 12, 1987

Docket Nos. 50-250
and 50-251

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Mr. C. O. Woody
Group Vice President
Nuclear Energy
Florida Power and Light Company
Post Office Box 14000
Juno Beach, Florida 33408

Dear Mr. Woody:

SUBJECT: EXEMPTIONS FROM THE REQUIREMENTS OF APPENDIX R TO 10 CFR 50, SECTION III.G.2 - TURKEY POINT UNITS 3 AND 4

Reference: TAC Numbers 61428 and 61429

The Commission has issued the enclosed exemptions from certain requirements of Appendix R to 10 CFR 50 in response to your letter dated April 25, 1986, as supplemented on February 11, 1987.

The location, fire zone and disposition of the exemption request for four specific areas from the provisions of Section III.G.2 of Appendix R to 10 CFR 50, which require separation of cables, equipment and associated non-safety circuits of redundant trains follows:

1. Fire barrier separating fire area AAA (Fire Zone 24) from fire area A (Fire Zones 4 and 5). This request is granted.

2. Fire barrier separating fire area F (Fire Zones 48, 49 and 50) from fire area A (Fire Zone 10). This request is granted.

3. Fire detection and suppression in outdoor fire areas. This request is granted.

4. Intervening combustibles between redundant shutdown systems inside containment, fire areas P and Q. This request is granted.

In granting the above exemption requests, we have determined that the level of protection provided in these areas is equivalent to the level of safety to that achieved by compliance with Section III.G.2 of Appendix R. The details of our evaluation and bases for our findings are contained in the enclosed exemption and safety evaluation.

A Notice of Environmental Assessment and Finding of No Significant Impact was published in the Federal Register on

The enclosed exemption is being forwarded to the Office of the Federal Register for publication. This completes our action related to the above referenced TAC numbers.

Sincerely,

/s/

Steven A. Varga, Director
Division of Reactor Projects-I/II

Enclosures:
1. Exemption
2. Safety Evaluation

cc w/enclosures:
See next page

LA:PD22	PM:PD22	D:PD22	OGC	AD2	D:DRP
DMiller	DMcDonald	LRubenstein	Fouse	GLainas	SVarga
7/26/87	7/30/87	7/31/87	8/3/87	8/7/87	8/10/87

Mr. C. O. Woody
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Turkey Point Plant

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7590-01

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of FLORIDA POWER AND LIGHT COMPANY (Turkey Point Plant, Unit Nos. 3 and 4)	)	Docket Nos. 50-250 and 50-251

EXEMPTION

I.

Florida Power and Light Company (the licensee) is the holder of Facility Operating License Nos. DPR-31 and DPR-41 which authorize the operation of the Turkey Point Plant, Unit Nos. 3 and 4 (the facilities) at steady-state power levels not in excess of 2200 megawatts thermal. The facilities are pressurized water reactors (PWRs) located at the licensee's site in Dade County, Florida. The licenses provide, among other things, that the facilities are subject to all rules, regulations and orders of the Commission now or hereafter in effect.

II.

On November 19, 1980, the Commission published a revised Section 10 CFR 50.48 and a new Appendix R to 10 CFR Part 50 regarding fire protection features of nuclear power plants (45 FR 76602). The revised Section 50.48 and Appendix R became effective on February 17, 1981. Section III of Appendix R contains 15 subsections, lettered A through O, each of which specifies requirements for a particular aspect of the fire protection features at a nuclear power plant. One of these fifteen subsections, III.G, is the subject of this exemption request. Specifically, Subsection III.G.2 requires that one train of cables and equipment necessary to achieve and maintain safe shutdown be maintained free of fire damage by one of the following means:

a. Separation of cables and equipment and associated 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;

b. Separation of cables and equipment and associated non-safety circuits or 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

c. 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.

III.

By letter dated April 25, 1986, as supplemented on February 11, 1987, the licensee requested approval of four exemptions from the technical requirements of Section III.G.2 of Appendix R to 10 CFR 50, which requires physical separation and/or fire protection systems to protect redundant trains of safe shutdown related cable and equipment.

The licensee has stated that the existing and proposed fire protection features at the Turkey Point site accomplish the underlying purpose of the rule. Requiring additional suppression systems, detection systems, and fire barriers would require the expenditure of engineering and construction resources as well as the associated capital costs and unnecessary radiation

exposure to workers which would represent an unwarranted burden on the licensee's resources. Information relevant to the "special circumstances" finding required by 10 CFR 50.12(a) (see 50 FR 50764) are:

- Engineering and construction costs for additional fire suppression and detection systems.
- Engineering and construction costs for additional fire barriers.
- Increased surveillance on new or extended fire suppression and fire detection systems.
- Significant radiation exposure in associated work areas which could result in exposures in excess of 10 CFR Part 20. Temporary shielding to reduce radiation is labor-intensive resulting in higher cost and radiation exposure to workers.

The licensee indicated that these costs and personnel exposure to high radiation levels are significantly in excess of those required to meet the underlying purpose of the rule. The staff concludes that "special circumstances" exist for the licensee's requested exemptions in that application of the regulation in these particular circumstances is not necessary to achieve the underlying purposes of Appendix R to 10 CFR Part 50. See 10 CFR 50.12(a)(2)(ii). The staff's evaluation of each request follows:

Fire Barrier Separating Fire Area AAA (Fire Zone 24) from Fire Area A (Fire Zones 4 and 5)

The licensee requested an exemption from the requirements of Section III.G.2 of Appendix R to the extent that it requires separation of cables and equipment and associated non-safety circuits or redundant trains by a fire barrier having a 3-hour rating.

Fire Zone 24 and Fire Zones 4 and 5 are located in the auxiliary building. The floor separating these zones is a rated fire barrier; however, it contains five unsealed penetrations.

The in situ fire load is negligible for Fire Zone 24. The highest in situ fire load is Fire Zone 5 and is equivalent to a fire severity of 34 minutes as represented by the ASTM E-119 time-temperature curve. Personnel access to these zones is strictly controlled. Therefore, the potential for accumulation of significant quantities of extraneous combustible material is reduced.

There are no redundant safe shutdown cables in Fire Zone 24 or immediately below the 3-hour rated floor in Fire Zones 4 and 5. Fire protection features include portable fire extinguishers and fire hose stations. Fire detection is provided which annunciates in the control room.

The fire protection in the above fire zones does not comply with the technical requirements of Section III.G.2.a of Appendix R because complete 3-hour fire rated barriers do not separate redundant divisions of safe shutdown components.

Because of the low combustible loading, any fire would develop slowly and have a low heat output. Smoke detectors located in Fire Zones 4 and 5 and near Fire Zone 24 provide reasonable assurance that any fire would be detected quickly and annunciated in the control room, resulting in a response by the brigade. The fire brigade would extinguish the fire using extinguishers or adjacent hose stations. The low fire loads in Fire Zones 4 and 5 will limit the severity of any fire near the penetrations. Since there is no redundant safe shutdown cable in Fire Zone 24, there is reasonable assurance that a fire in the vicinity of the penetrations would not affect the safe shutdown capability of the plant.

Based on the above evaluation, the licensee's existing fire protection configuration provides an equivalent level of safety to that achieved by compliance with Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

Fire Barrier Separating Fire Area F (Fire Zones 48, 49, and 50) from Fire Area A (Fire Zone 10)

The licensee requested an exemption from the technical requirements of Section III.G.2 of Appendix R to the extent that it requires separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating.

Fire Zones 48, 49 and 50, and Fire Zone 10 are located in the auxiliary building. The floor separating these zones is a 3-hour rated fire barrier; however, it is penetrated by two 8-inch sleeves in the floor of Fire Zone 48, and one 6-inch sleeve in each of Fire Zones 49 and 50.

The in situ fire load is negligible in all zones except Fire Zone 10, which is equivalent to a fire severity of 14 minutes as represented by the ASTM E-119 fire test curve. Personnel access to this zone is strictly controlled. Therefore, the potential for accumulation of significant quantities of transient combustible material is reduced.

There are no redundant safe shutdown cables in Fire Zones 48, 49 and 50. The nearest safe shutdown cable is located in Fire Zone 10, approximately 10 feet away from the nearest unsealed penetration. Fire Zones 48, 49 and 50 are enclosed by full height concrete shield walls, and the floor penetrations are located behind a labyrinth wall.

Fire protection includes portable fire extinguishers and fire hose stations. Fire detection is provided which annunciates in the control room.

The fire protection in the above fire zones does not comply with the technical requirements of Section III.G.2.a of Appendix R because complete 3-hour fire rated barriers do not separate redundant divisions of safe shutdown components. Because of the low combustible loading, any fire would develop slowly with low heat output. The smoke detectors provide reasonable assurance that any fire would be detected quickly and annunciated in the control room, resulting in a response by the fire brigade. The fire brigade would extinguish the fire using extinguishers or adjacent hose stations.

The low fire loads in Fire Zone 10 will limit the severity of any fire near the penetrations. Since there are no redundant safe shutdown cables in Fire Zones 48, 49 and 50, there is reasonable assurance that a fire in the vicinity of the penetrations would not affect the safe shutdown capability of the plant.

Based on the above evaluation, the licensee's existing fire protection configuration provides an equivalent level of safety to that achieved by conformance with Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

Fire Detection and Suppression in Outdoor Fire Zones 76, 77, 78, 79, 80, 81, 82, 83, 85, 86, 87, 88, 90, 91, 92, 105, 106R, 117 and 118

The licensee requested an exemption from the technical requirements of 10 CFR 50 to the extent that it requires fire detection and automatic fire suppression systems in areas containing redundant safe shutdown components.

The fire zones listed above are located in outside areas or within the perimeter of the open structure turbine building. The majority of redundant safe shutdown equipment and cable located in outdoor areas are located in Fire Zones 79, 84 and 89. An exemption from the requirement of fire detection and suppression systems for these three zones was previously granted by letter dated March 27, 1984.

The combustible materials in the zones that are the subject of this evaluation consist of cables and combustible liquids enclosed in stationary containers, such as lube oil storage tanks and transformers. The combustible liquids have high flash points and are protected by automatic fire suppression systems.

Fire protection includes portable fire extinguishers, hose stations, and fire hydrants. Redundant safe shutdown cables are separated horizontally by a distance of at least 20 feet or are provided with 1-hour rated barriers where 20 feet of separation cannot be maintained.

The fire protection in the above zones does not comply with the technical requirements of Section III.G.2 of Appendix R because fire detection and automatic fire suppressions systems are not provided.

The open nature of these areas will prevent stratification of hot gases in the event of a fire, thereby limiting the size and heat output of the fire. Further assurance that a fire would not affect safe shutdown components exists because redundant cables and components are separated by at least 20 feet or have a 1-hour rated fire wrap where 20 feet of separation cannot be maintained. Hazards from combustible liquids have been minimized because of their storage in containers conforming to the guidelines of NFPA standard no. 30 and existing local fire protection including automatic fire suppression systems.

The addition of area-wide fire detection and automatic fire suppression systems would not significantly improve the level of fire protection.

Based on the above evaluation, the existing fire protection features provide a level of fire protection equivalent to the technical requirements of Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

Inside Containment, Fire Areas P and Q

The licensee requested an exemption from the technical requirements of Section III.G.2.d of Appendix R to the extent that it requires no intervening combustibles when cables and equipment and associated non-safety circuits of redundant trains are separated by a horizontal distance of at least 20 feet.

Each containment building is classified as one fire area (Fire Areas O and P) for Turkey Point Units 3 and 4. The containment building is essentially an open area. There are three intermediate floor levels, a primary shield wall around the reactor, and a secondary shield wall around the primary loop.

The redundant safe shutdown cables tend to run radially away from the reactor and follow the containment perimeter to their electrical penetration rooms. Although the cables are generally separated by much more than 20 feet, there are intervening combustible materials, mostly lubricating oil and other cable.

The reactor coolant pump motors are located in separate cubicles and are fitted with oil collection assemblies to address Appendix R, Section III.O requirements. The other oil sources are relatively small quantities located away from most safe shutdown cables, and are not in close proximity to piping with temperatures higher than the oil flash point. Most of the area fire load is comprised of the oil in the reactor coolant pump motors.

The other major source of combustible material, the cables, are either coated with a fire retardant coating or qualified to the requirements of IEEE Standard 383-1974. Since access to the containment during plant operation is strictly limited, the probability of large amounts of transient combustibles being accumulated is low.

Fire protection features include physical separation of the redundant equipment and their associated cables and 1-hour rated fire barriers. Portable fire extinguishers are located inside containment and in the immediate vicinity of each personnel access hatch. Smoke detectors which alarm in the control room are installed in the electrical penetration area.

The fire protection in the above fire areas does not comply with Section III.G.2 because of intervening combustibles between redundant safe shutdown components and circuitry.

Although there is a significant fire load due to lubricating oil in the reactor coolant pump motors, the motors have an oil collection system which minimizes the possibility of a fire. The fire potential in the cables is reduced because they are either coated with a fire retardant coating or are IEEE 383 rated. The location of the cables and equipment of the mid-elevation of the large containment building will also limit their damage from hot gases caused by stratification.

The above features reduce the amount of combustible material to a low level, and along with the large volume of the containment provide reasonable assurance that any fire would develop slowly and have limited heat output. Therefore, it is not probable that a single fire could jeopardize both trains of redundant safe shutdown components or circuitry.

Based on the above evaluation, the licensee's existing fire protection configuration provides an equivalent level of protection to that achieved by compliance with Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

IV.

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

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of these exemptions will not result in any significant environmental impact (August 12, 1987, 52 FR 29940).

A copy of the Safety Evaluation dated August 12, 1987, related to this action is available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. 20555 and at the Environmental and Public Affairs Library, Florida International University,

Miami, Florida 33199. A copy may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Reactor Projects-I/II.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
Division of Reactor Projects-I/II

Dated at Bethesda, Maryland,
this 12th day of August, 1987

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO EXEMPTIONS FROM 10 CFR 50, APPENDIX R

FACILITY OPERATING LICENSE NOS. DPR-31 AND DPR-41

TURKEY POINT PLANT, UNIT NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

I. INTRODUCTION

By letter dated April 25, 1986, Florida Power and Light Company (the licensee) requested approval of four exemptions from the technical requirements of Section III.G.2 of Appendix R to 10 CFR 50. Additional information on these exemptions was submitted in a letter dated February 11, 1987.

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 containing 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.

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, design basis protective features are specific in the rule rather than a design basis fire. Plant-specific features may require protection which is 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 an alternative fire protection configuration must be justified by a fire hazard analysis.

The staff's 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 of 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 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.

II. EVALUATION

1.0 Fire Barrier Separating Fire Area AAA (Fire Zone 24) from Fire Area A (Fire Zones 4 and 5)

1.1 Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.2 of Appendix R to 10 CFR 50 to the extent that it requires separation of cables and equipment and associated non-safety circuits or redundant trains by a fire barrier having a 3-hour rating.

1.2 Discussion

Fire Zone 24 and Fire Zones 4 and 5 are located in the auxiliary building at elevations of 18 feet 0 inches and 10 feet 0 inches, respectively. The floor separating these zones is a rated fire barrier; however, it contains four unsealed penetrations consisting of 2-inch embedded sleeves enclosing cables and one unsealed penetration containing 15 3/8-inch instrument tubes.

The in situ fire load, consisting of cables, grease in valves, and miscellaneous plastic materials, is 32,800 Btu per square foot for Fire Zone 4, 45,500 Btu per square foot for Fire Zone 5, and is negligible for Fire Zone 24. The highest of these values, Fire Zone 5, is equivalent to a fire severity of 34 minutes as represented by the ASTM E-119 time-temperature curve. Because these fire zones, or portions thereof, are classified as "Locked High Radiation Areas," or are in radiologically controlled areas, personnel access to these zones is strictly controlled. Therefore, the potential for accumulation of significant quantities of extraneous combustible material is reduced.

There are no redundant safe shutdown cables in Fire Zone 24 or immediately below the 3-hour rated floor in Fire Zones 4 and 5.

Fire protection features include portable fire extinguishers and fire hose stations. Fire detection consists of ionization-type smoke detectors installed in Fire Zones 4 and 5 and in a hallway adjacent to Fire Zone 24 which annunciate in the control room.

The licensee justified the exemption request on the basis of the limited fire load, existing fire protection and ALARA radiation exposure concerns to the workers who would have to enter these locations in order to install additional fire protection features.

1.3 Evaluation

The fire protection in the above fire zones does not comply with the technical requirements of Section III.G.2.a of Appendix R because complete 3-hour fire rated barriers do not separate redundant divisions of safe shutdown components.

The staff was originally concerned that a fire in one of the fire zones could spread to the redundant safe shutdown components located in the adjacent zone. However, the probability that a fire would start in Fire Zone 24 is low due to the limited personnel access and lack of ignition sources in the area.

Because of the low combustible loading, any fire would develop slowly and have a low heat output. Smoke detectors located in Fire Zones 4 and 5 and near Fire Zone 24 provide reasonable assurance that any fire would be detected quickly and annunciated in the control room, resulting in a response by the brigade. The fire brigade would extinguish the fire using extinguishers or adjacent hose stations.

The low fire loads in Fire Zones 4 and 5 will limit the severity of any fire near the penetrations. Since there is no redundant safe shutdown cable in Fire Zone 24, there is reasonable assurance that a fire in the vicinity of the penetrations would not affect the safe shutdown capability of the plant.

1.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's existing fire protection configuration provides an equivalent level of safety to that achieved by compliance with Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

2.0 Fire Barrier Separating Fire Area F (Fire Zones 48, 49 and 50) from Fire Area A (Fire Zone 10)

2.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.G.2 of Appendix R to the extent that it requires separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating.

2.2 Discussion

Fire Zones 48, 49 and 50, and Fire Zone 10 are located in the auxiliary building at elevations of 18 feet, 0 inches and 10 feet, 0 inches, respectively. The floor separating these zones is a 3-hour rated fire barrier; however, it is penetrated by two 8-inch sleeves in the floor of Fire Zone 48, and one 6-inch sleeve in each of Fire Zones 49 and 50. These penetrations contain 3-inch pipe and are unsealed.

The in situ fire load, consisting of cables, grease in valves, and miscellaneous plastic materials, is 19,000 Btu per square foot for Fire Zone 10, and is negligible for the other zones. The value in Fire Zone 10 is equivalent to a fire severity of 14 minutes as represented by the ASTM E-119 fire test curve. Because these fire zones, or portions thereof, are classified as "Locked High Radiation Areas," or are in radiologically controlled areas, personnel access to these zones is strictly controlled. Therefore, the potential for accumulation of significant quantities of transient combustible material is reduced.

There are no redundant safe shutdown cables in Fire Zones 48, 49 and 50. The nearest safe shutdown cable is located in Fire Zone 10, approximately 10 feet away from the nearest unsealed penetration. Fire Zones 48, 49 and 50 are enclosed by full height concrete shield walls, and the floor penetrations are located behind a labyrinth wall.

Fire protection includes portable fire extinguishers and fire hose stations. Fire detection consists of ionization-type smoke detectors installed in Fire Zone 10 and in a hallway adjacent to Fire Zones 48, 49 and 50. These smoke detectors annunciate in the control room.

The licensee justified the exemption request on the basis of the limited fire loading, the existing fire protection and ALARA radiation exposure concerns to the workers who would have to enter these locations to install additional fire protection features.

2.3 Evaluation

The fire protection in the above fire zones does not comply with the technical requirements of Section III.G.2.a of Appendix R because complete 3-hour fire rated barriers do not separate redundant divisions of safe shutdown components. The staff was concerned that a fire in one of the fire zones could spread to the redundant safe shutdown components located in the adjacent zone. However, it is unlikely that a fire would start in Fire Zones 48, 49 and 50 because they have a negligible fire load and personnel access is limited.

Because of the low combustible loading, any fire would develop slowly with low heat output. The smoke detectors located in Fire Zone 10 and near Fire Zones 48, 49 and 50 provide reasonable assurance that any fire would be detected quickly and annunciated in the control room, resulting in a response by the fire brigade. The fire brigade would extinguish the fire using extinguishers or adjacent hose stations.

The low fire loads in Fire Zone 10 will limit the severity of any fire near the penetrations. Since there are no redundant safe shutdown cables in Fire Zones 48, 49 and 50, there is reasonable assurance that a fire in the vicinity of the penetrations would not affect the safe shutdown capability of the plant.

2.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's existing fire protection configuration provides an equivalent level of safety to that achieved by conformance with Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

3.0 Fire Detection and Suppression in Outdoor Fire Zones

3.1 Exemption Requested

The licensee requested an exemption from the technical requirements of 10 CFR 50 to the extent that is requires fire detection and automatic fire suppression systems in areas containing redundant safe shutdown components.

3.2 Discussion

The following outdoor fire zones are affected:

Fire Zone	Elevation	Fire Suppression	Description
76	18'0"	Fixed Water Spray	Unit 4 Lube Oil Reservoir
77	18'0"	N/A	Unit 4 Laydown Area and Condensate Storage Area
78	18'0"	Partial Wet Pipe Automatic Sprinkler	Unit 4 Air Compressor Area
80	2'0"	N/A	Unit 4 Main Condenser
81	18'0"	Fixed Water Spray	Unit 4 Main Transformer
			Unit 3 Main Turbine Lube Oil
82	18'0"	Fixed Water Spray	Unit 4 Start-up Transformer
83	18'0"	N/A	Unit 4 Auxiliary Transformer
85	2'0"	N/A	Unit 3 Air Compressor Area
86	18'0"	Fixed Water Spray	Unit 3 Main Condenser
			Unit 3 Main Transformer and Start-up Transformer
87	18'0"	Fixed Water Spray	Unit 3 Auxiliary Transformer
88	18'0"	N/A	Unit 3 Ground Floor Vestibule
90	18'0"	N/A	Units 3 & 4 Emergency Diesel Gen. Oil Storage Tank
91	5'0"	Partial Wet Pipe Automatic Sprinkler	Unit 4 Condensate Pump
92	5'0"	Partial Wet Pipe Automatic Sprinkler	Unit 3 Condensate Pump
105	30'0"	Partial Wet Pipe Automatic Sprinkler	Units 3 & 4 Turbine Bldg Mezzanine Deck
106R	58'6"	N/A	Control Room Roof
117	42'0"	N/A	Units 3 & 4 Turbine Deck
118	61'0"	N/A	Units 3 & 4 Auxiliary Bldg Roof

The fire zones listed above are located in outside areas or within the perimeter of the open structure turbine building. The majority of redundant safe shutdown equipment and cable located in outdoor areas are located in Fire Zones 79, 84 and 89. An exemption from the requirement of fire detection and suppression systems for these three zones was previously granted by letter dated March 27, 1984.

The combustible materials in the zones that are the subject of this evaluation consist of cables and combustible liquids enclosed in stationary containers, such as lube oil storage tanks and transformers. The combustible liquids have high flash points and are protected by automatic fire suppression systems.

Fire protection includes portable fire extinguishers, hose stations, and fire hydrants. Redundant safe shutdown cables are separated horizontally by a distance of at least 20 feet or are provided with 1-hour rated barriers where 20 feet of separation cannot be maintained.

3.3 Evaluation

The fire protection in the above zones does not comply with the technical requirements of Section III.G.2 of Appendix R because fire detection and automatic fire suppression systems are not provided.

The open nature of these areas will prevent stratification of hot gases in the event of a fire, thereby limiting the size and heat output of the fire. Further assurance that a fire would not affect safe shutdown components exists because redundant cables and components are separated by at least 20 feet or have a 1-hour rated fire wrap where 20 feet of separation cannot be maintained. Hazards from combustible liquids have been minimized because of their storage in containers conforming to the guidelines of NFPA standard no. 30 and existing local fire protection including automatic fire suppression systems.

It is concluded that the addition of area-wide fire detection and automatic fire suppression systems would not significantly improve the level of fire protection.

3.4 Conclusion

Based on the above evaluation, the existing fire protection features provide a level of fire protection equivalent to the technical requirements of Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

4.0 Inside Containment, Fire Areas P and Q

4.1 Exemption Requested

The licensee requested an exemption from the technical requirements of Section III.G.2.d of Appendix R to the extent that it requires no intervening combustibles when cables and equipment and associated non-safety circuits of redundant trains are separated by a horizontal distance of at least 20 feet.

4.2 Discussion

Each containment building is classified as one fire area (Fire Areas P and Q) for Turkey Point Units 3 and 4. The containment building is essentially an open area with an inside diameter of 116 feet and a free volume of 1.5 million cubic feet. There are three intermediate floor levels, a primary shield wall around the reactor, and a secondary shield wall around the primary loop.

The redundant safe shutdown cables tend to run radially away from the reactor and follow the containment perimeter to their electrical penetration rooms. Although the cables are generally separated by much more than 20 feet, there are intervening combustible materials, mostly lubricating oil and other cable.

The lubricating oil is contained in the reactor coolant pumps, control rod drive mechanism, normal containment cooler fan motors, emergency containment cooler fan motors, containment sump pump motors, and various motor-operated valves and snubbers. The reactor coolant pump motors are located in separate cubicles and are fitted with oil collection assemblies to address Appendix R, Section III.O requirements. The other oil sources are relatively small quantities located away from most safe shutdown cables, and are not in close proximity to piping with temperatures higher than the oil flash point. Most of the area fire load of 121,000 Btu per square foot is comprised of the oil in the reactor coolant pump motors.

The other major source of combustible material, the cables, are either coated with a fire retardant or qualified to the requirements of IEEE Standard 383-1974. Since access to the containment during plant operation is strictly limited, the probability of large amounts of transient combustibles being accumulated is low.

Fire protection features include physical separation of the redundant equipment and their associated cables and 1-hour rated fire barriers. Portable fire extinguishers are located inside containment and in the immediate vicinity of each personnel access hatch. Ionization-type smoke detectors which alarm in the control room are installed in the electrical penetration area.

4.3 Evaluation

The fire protection in the above fire areas does not comply with Section III.G.2 because of intervening combustibles between redundant safe shutdown components and circuitry.

The staff's concern was that a fire could cause a loss of normal safe shutdown capability. Although there is a significant fire load due to lubricating oil in the reactor coolant pump motors, the motors have an oil collection system which minimizes the possibility of a fire. The fire potential in the cables is reduced because they are either coated with a fire retardant coating or are IEEE 383 rated. The location of the cables and equipment of the mid-elevation of the large containment building will also limit their damage from hot gases caused by stratification.

The above features reduce the amount of combustible material to a low level, and along with the large volume of the containment provide reasonable assurance that any fire would develop slowly and have limited heat output. Therefore, it is not probable that a single fire could jeopardize both trains of redundant safe shutdown components or circuitry.

4.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee's existing fire protection configuration provides an equivalent level of protection to that achieved by compliance with Section III.G.2 of Appendix R. Therefore, the licensee's request for exemption, as described above, should be granted.

III. SUMMARY AND CONCLUSION

Based on the evaluation, the staff concludes that the existing fire protection and/or physical arrangements provide a level of fire protection equivalent to the technical requirements of Section III.G of Appendix R; therefore, the licensee's request for the following exemptions should be granted:

1. Fire Areas AAA and A to the extent that a 3-hour fire rated barrier is not provided between redundant safe shutdown system components.

2. Fire Areas F and A to the extent that a 3-hour fire rated barrier is not provided between redundant safe shutdown system components.

3. Outdoor fire areas as delineated in Section 3.0 of these evaluation to the extent that fire detection and automatic fire suppression systems are not provided.

4. Fire Areas P and Q to the extent that intervening combustibles exist between redundant safe shutdown components inside the containment when they are separted by a distance of at least 20 feet.

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