



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 4, 1999

Mr. T. F. Plunkett  
President - Nuclear Division  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, Florida 33408-0420

SUBJECT: EXEMPTION FROM CERTAIN REQUIREMENTS OF 10 CFR PART 50,  
APPENDIX R, FOR TURKEY POINT UNITS 3 AND 4, REGARDING FIRE ZONE  
106R, CONTROL BUILDING ROOF (TAC NOS. MA3972 AND M3974)

Dear Mr. Plunkett:

By letter dated December 12, 1996, you requested an exemption from certain requirements of 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," for Turkey Point Units 3 and 4. Specifically, you requested an exemption from the requirements pertaining to the 3-hour fire barriers required by Section III.G.2.a of Appendix R to 10 CFR Part 50 for raceway fire barriers in outdoor fire zones, excluding the open turbine building.

By letter dated February 24, 1998, the U.S. Nuclear Regulatory Commission (NRC) staff denied your request for exemption for fire zone 106R, the control building roof, based on the uncertainty of the roof's combustibility and fire classification. During a site visit, on September 14, 1998, your staff informed us that it had obtained additional information to support that the control building roofing is equivalent to Class A construction per American National Standard/Underwriters Laboratories, Inc., No. 790, "Tests for Fire Resistance of Roof Covering Materials, Seventh Edition." Subsequently, by letters dated November 2, 1998, and February 11, 1999, you submitted additional information for NRC staff review regarding the classification of the fire zone 106R roof construction.

Based on its review, the staff finds that granting an exemption, with respect to fire zone 106R, from the requirements of 10 CFR Part 50, Appendix R, Section III.G.2.a, is appropriate and is authorized by law, will not present an undue risk to public health and safety, and is consistent with the common defense and security, and that special circumstances described in 10 CFR 50.12(a)(2)(ii) are present. Accordingly, your request for an exemption for fire zone 106R has been granted.

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May 4, 1999

A copy of the exemption and the supporting safety evaluation are enclosed. The exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by:

Kahtan N. Jabbour, Senior Project Manager, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

- Enclosure: 1. Exemption
- 2. Safety Evaluation

cc w/encl: See next page

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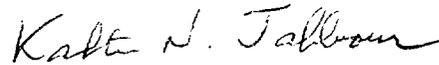
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Mr. T. F. Plunkett

- 2 -

A copy of the exemption and the supporting safety evaluation are enclosed. The exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,



Kahtan N. Jabbour, Senior Project Manager, Section 2  
Project Directorate II  
Division of licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

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cc w/encl: See next page

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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

EXEMPTION

I.

Florida Power and Light Company (the licensee) is the holder of Facility Operating Licenses Nos. DPR-31 and DPR-41, which authorize operation of Turkey Point Units 3 and 4 (the facility), respectively, at a steady-state reactor power level not in excess of 2300 megawatts thermal. The facility is a pressurized-water reactor located at the licensee's site in Dade County, Florida. The licenses require among other things that the facility comply with all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (the Commission or NRC) now or hereafter in effect.

II.

In exemptions dated March 27, 1984, and August 12, 1987, concerning the requirements of Section III.G, Appendix R to 10 CFR Part 50, the staff approved the use of 1-hour-rated fire barriers in lieu of 3-hour barriers in certain outdoor areas at Turkey Point Units 3 and 4. In addition, the staff found that, for certain outdoor areas not protected by automatic fire detection and suppression systems, separation of cables and equipment and associated non-safety-

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related circuits of redundant trains by a horizontal distance of 20 feet free of intervening combustibles provided an acceptable level of fire safety.

On the basis of the results of the industry's Thermo-Lag fire endurance testing program, the licensee concluded that the outdoor Thermo-Lag fire barrier designs cannot achieve a 1-hour fire-resistive rating but can achieve a 30-minute fire-resistive rating when exposed to a test fire that follows the American Society for Testing and Materials E-119 standard time-temperature curve. Because of these test results, the licensee in a letter dated June 15, 1994, requested an exemption to use 30-minute fire barriers for outdoor applications in lieu of the 1-hour fire barriers previously approved; however, the exemption request was withdrawn by letter dated June 28, 1996.

In a letter dated December 12, 1996, the licensee requested an exemption from the requirements pertaining to the 3-hour fire barriers required by Section III.G.2.a, Appendix R to 10 CFR Part 50, for the outdoor areas, excluding the turbine building area. The licensee requested that the NRC approve the use of 25-minute raceway fire barriers for these outdoor applications in lieu of the 1-hour fire barriers that were previously approved (refer to safety evaluations dated March 27, 1984, and August 12, 1987).

By letter dated February 24, 1998, the NRC staff denied the licensee's request for exemption for fire zone 106R, the control building roof, based on the uncertainty of the roof's combustibility and fire classification. During a site visit, on September 14, 1998, the licensee informed the NRC staff that it had obtained additional information to support that the control building roofing composite was an equivalent Class A construction per American National Standard/Underwriters Laboratories, Inc. No. 790, "Tests for Fire Resistance of Roof Covering Materials, Seventh Edition." Subsequently, by letters dated November 2, 1998, and February 11, 1999, the licensee submitted additional information for staff review regarding the classification of the fire zone 106R roof construction.

## III.

The underlying purpose of Section III.G.2.a, Appendix R to 10 CFR Part 50, is to provide reasonable assurance that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire in the plant.

On the basis of the staff's supporting safety evaluation of the licensee's submittals, the staff concludes that the exemption from the requirements of Section III.G.2.a of Appendix R, for fire zone 106R as requested by the licensee, provides an adequate level of fire safety, and presents no undue risk to public health and safety. In addition, the staff concludes the underlying purpose of the rule is achieved.

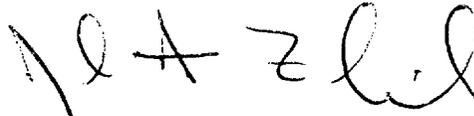
## IV.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to public health and safety, and is consistent with the common defense and security. In addition, the Commission has determined that special circumstances are present in that application of the regulation in the particular circumstances here is not necessary to achieve the underlying purpose of the rule. Therefore, the Commission hereby grants Florida Power and Light Company an exemption from the requirements of Section III.G.2.a of Appendix R to 10 CFR Part 50, as requested in its above-referenced submittals, for fire zone 106R.

Pursuant to 10 CFR 51.32, the Commission has determined that granting this exemption for fire zone 106R will not have a significant effect on the quality of the human environment (64 FR 14276).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read 'John A. Zwolinski', written in a cursive style.

John A. Zwolinski, Director  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
this 4<sup>th</sup> day of May 1999



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
EXEMPTION RELATED TO 10 CFR PART 50, APPENDIX R, SECTION III.G.2.a  
FLORIDA POWER AND LIGHT COMPANY  
TURKEY POINT UNITS 3 AND 4  
DOCKET NOS. 50-250 AND 50-251

1.0 BACKGROUND

Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, establishes fire protection features required to satisfy General Design Criterion 3, "Fire protection," of Appendix A to 10 CFR Part 50 with respect to certain generic issues for nuclear power plants licensed to operate prior to January 1, 1979. The underlying purpose of Appendix R, Section III.G.2, is to provide reasonable assurance that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire in the plant.

By letter dated December 12, 1996, Florida Power and Light (FPL), the licensee for Turkey Point Units 3 and 4, submitted an exemption request to the U.S. Nuclear Regulatory Commission (NRC) concerning certain requirements of 10 CFR Part 50, Appendix R, Section III.G.2.a. Specifically, the licensee requested an exemption from the technical requirements for certain outdoor fire zones to the extent that it had not protected one train of systems necessary to achieve and maintain hot shutdown with 3-hour fire rated barriers. Instead, the licensee proposed separation of cables and equipment and associated non-safety circuits of redundant trains on the control building roof, by a 25-minute rated fire barrier until a horizontal distance of 10 feet is attained, with no automatic suppression or detection capabilities.

By letter dated February 24, 1998, the NRC denied the licensee's request for exemption for fire zone 106R, the control building roof, based on the uncertainty of the roof's combustibility and fire classification. During a site visit, on September 14, 1998, the licensee informed the staff that it had obtained additional information to support that the control building roofing is equivalent to Class A construction per American National Standard/Underwriters Laboratories, Inc., (ANSI/UL), No. 790, "Tests for Fire Resistance of Roof Covering Materials, Seventh Edition." By letters dated November 2, 1998, and February 11, 1999, the licensee submitted additional information for NRC staff review regarding the classification of the fire zone 106R roof construction.

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## 2.0 DISCUSSION

### Fire Zone 106R - Control Room Air Conditioner Condensing Units on the Control Building

The control building roof is made of concrete construction and provided with a composition "tar and gravel" covering. Fire zone 106R, which is the southwest section of the control building roof, is designated as an alternate post-fire safe shutdown area for the control room air conditioning condensing units. The remainder of the control building roof, fire zone 118, contains the computer room and cable spreading room chiller units.

The top of the control building roof is at plant elevation 58'-0", with normal access from the turbine deck (elevation 42'-0") via stairs. Another stairwell provides access to the turbine deck in the same area from the mezzanine (elevation 30'-0"). Combustible load is negligible for fire zone 106R. Three portable fire extinguishers on the turbine deck near the roof access stairs and three near the stairs at the mezzanine level provide primary fire protection for the control building roof. In addition, three accessible hose stations provide secondary fire protection so that hose stream water can be applied to any portion of the roof. Accessible hose stations include HS-03-08 with a 75' hose in fire zone 117 near the stairs, HS-04-06 with a 100' hose in fire zone 117 just southwest of the control building, and HS-04-03 with 100' hose in fire zone 105 at the stairwell.

The licensee determined that the roofing materials consist of: (1) Houdaille Span (6" thick pre-stressed concrete panels); (2) reinforced concrete deck (1'-6" thick); (3) a Koroseal vapor barrier; (4) Flintkote roof insulation (nominal 1-1/2" thick); (5) Lexsucu adhesive; (6) Ruberoid asphalt felt, four layers at 15 pounds, conforming to ASTM D226-60, "Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing"; (7) four layers of Ruberoid asphalt conforming to ASTM D312, "Standard Specification for Asphalt Used in Roofing"; (8) one pouring of Type 1 asphalt; and (9) clean, dry opaque 1/4" to 5/8" gravel. The licensee also determined that the roof complies with Class A requirements per ANSI/UL 790. The control building roof is considered to be a negligible contribution to the in situ combustible load and the gravel on the roof would resist fire from, and to, the roof.

The post-fire safe shutdown functions and their corresponding protected raceways, which are shown in Table 1, are located outdoors on the control building roof. The protected raceways and the associated post-fire safe shutdown functions are separated from the redundant train by a 25-minute rated fire barrier until a horizontal distance of 10 feet is attained.

## 3.0 EVALUATION

The NRC staff was concerned that an adequate level of fire safety, for the post-fire safe shutdown components, did not exist for fire zone 106R due to the uncertainty of the combustibility and fire classification of the control building roof. By letter dated February 11, 1999, the licensee stated that the description of roof materials and construction were obtained from design drawings as supplemented by the original specifications. The licensee stated that it had verified the details shown on the drawings through the plant modification process where localized excavation to the concrete base was required to install new raceway supports. The details were reflected on drawing 5610-C-312 in 1992. The licensee compared the information from this drawing and the original specifications to the UL tested systems, identified in Table 2.

The licensee concluded that the control building roof installation is structurally similar to UL System J904, a Class A design. In addition, the licensee determined that the control roof building configuration is most similar to UL System R1306 for GAF Materials Corporation Systems. UL provided written confirmation to the licensee, that the control building roof complies with Class A requirements per ANSI/UL 790. Class A roof coverings are effective against severe fire test exposures. Under such exposures, roof coverings of this class are not readily combustible, provide a high degree of fire protection to the roof deck while remaining in place, and are not expected to produce flying brands. Therefore, the staff is reasonably assured by the licensee's evaluation, that the level of fire safety provided by the control building roof in fire zone 106R is equivalent to a Class A design.

In addition, the staff was concerned that if the tar on the control building roof were to ignite, that flames would propagate towards the protected and redundant raceways, disabling the post-fire safe shutdown functions. As part of its evaluation, the staff reviewed national roofing standards and considered licensee measures taken to ensure that the gravel continually covers the roof area at the required 400 pounds per square (i.e., 100 square feet). "The Handbook of Industrial Loss Prevention," by Factory Mutual, as well as National Fire Protection Association Standard 203, "Roof Coverings and Roof Deck Constructions," both state that since gravel acts to reflect heat, there is no appreciable danger of ignition, thus improving the fire performance of the coverings. The control building roof is relatively flat, having a slope of 1/8" per foot. There is a parapet to prevent runoff and intervening structures which mitigate the potential eroding effects of prevailing winds. In accordance with Plant Procedure O-SMM-102.2, roof inspections are performed in the spring, fall, and after any severe wind storm. Any deficiencies, such as thinning of the gravel layer, are identified and addressed via the licensee's condition reporting process. Since fire zone 106R is an open outdoor area and the in situ fire load is minimal, it can be reasonably expected that any fire would be small and that the post-fire safe-shutdown functions protected by the 25-minute raceway fire barriers or 10 feet of spatial separation will remain free of fire damage until either the fire burns itself out or it is detected by plant personnel and extinguished by the plant fire brigade.

#### 4.0 CONCLUSION

On the basis of its evaluation and review, as documented above, the staff concludes that for fire zone 106R, 3-hour fire-rated barriers are not needed to satisfy the underlying purpose of Section III.G.2.a of Appendix R to 10 CFR Part 50 for the post-fire-safe-shutdown functions identified in Table 1 to this safety evaluation. The licensee's request to separate cables and equipment and associated non-safety circuits of redundant trains by 25-minute rated fire barriers until a horizontal distance of 10 feet is attained provides an adequate level of fire safety for the post-fire safe shutdown capability. Therefore, the licensee's request for exemption from the technical requirements of Section III.G.2.a of Appendix R to 10 CFR Part 50 for fire zone 106R should be granted.

Attachments: 1. Table 1  
2. Table 2

Principal Contributor: Tanya Eaton  
Date: May 4, 1999

**Table 1: Listing of Control Building Roof Protected Raceways**

Raceway	Safe Shutdown Function
PB7332	LC3D-LC3H Power Feeder
3F1341	125V DC To 480V LC 3D 125V DC To 480V LC 3B 125V DC To 4160V Bus 4B (ALT) 125V DC To 4160V Bus 3B (NORM) 125V DC To AFW Valve Power Distribution Panel 125V DC To 4160V Bus 4B (NORM)
3J1946	LC3D-LC3H Power Feeder
3J1947	LC3D-LC3H Power Feeder
3J1948	LC3D-LC3H Power Feeder
3J1949	LC3D-LC3H Power Feeder
3J1950	LC3D-LC3H Power Feeder
3J1951	LC3D-LC3H Power Feeder
3J1965	LC3D-LC3H Feeder Breaker Control LC3H Breaker Position To Sequencer 3B Charging Pump 3C Control Emergency Containment Cooler Fan 3B Control LC 4H-LC 4D Incoming Breaker Control Charging Pump 4C Control
3K1713	125V DC To Alternate Shutdown Panel 3C264 120V AC From Inverter 3C To Power Panel 3P93 120V AC From Inverter CS To Power Panel 3P93 AFW Turbine Trip & Throttle Valve Control
4J1760	125V DC To EDG 3B Exciter Cabinet AFW Turbine Trip & Throttle Valve Control
4J2103	Cable Spread/Computer Room Chiller (S74A) Power
4K1417	125V DC To Alternate Shutdown Panel 4C264 120V AC To Power Panel 4P93

**Table 2: Comparison of Control Building Roof to UL Systems R1306 and  
GAFGLAS SPEC 1-0-4-G**

<b>CONTROL BUILDING ROOF</b>	<b>UL SYSTEMS R1306</b>	<b>GAFGLAS SPEC I-0-4-G</b>
Vapor Barrier	Not Indicated	Not Specified
1-1/2" Insulation	1-1/2" Insulation	Not Specified
4 Layers Felt @ 15 pounds per square	GAFGLAS Ply 4	4 Ply Felt
4 Moppings Type I Asphalt @ 92 pounds per square	3 Moppings Type G1 Asphalt	4 Moppings Type II Asphalt @ 80 - 120 pounds per square
1 Pouring Type I Asphalt @ 60 pounds per square	1 Flood Coat of Hot Roofing Asphalt	1 Pouring Type II Asphalt @ 60 pounds per square
Gravel @ 400 pounds per square	Gravel @ 400 pounds per square	Gravel @ 400 pounds per square
612 pounds per square total	Not Indicated	505 - 625 pounds per square total
1/8" Slope	1/4" Slope Maximum	1/2" Slope Maximum
Class Not Specified	UL Class A	UL Class A

Mr. T. F. Plunkett  
Florida Power and Light Company

## TURKEY POINT PLANT

cc:

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