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PLUNKETT,T.F. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Requests exemption from certain requirements of 10CFR50 App R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to 790101," for Units 1 & 2.

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L-94-146
10 CFR §50.12
10 CFR §50.48
10 CFR Part 50 Appendix R

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Request for Exemption - Special Use of
Thermo-Lag Fire Barriers in Outdoor Fire Area

The purpose of this letter is to request, in accordance with the provisions of Title 10 Code of Federal Regulations section 50.12 (10 CFR §50.12), 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. The exemption request is provided as an attachment to this letter.

Specifically, Florida Power & Light Company (FPL) requests an exemption from the requirements of 10 CFR Part 50 Appendix R subsections III.G.2.a and c for Thermo-Lag fire barriers in outdoor fire zones at Turkey Point. The attached exemption seeks NRC approval to allow the use of 30-minute Thermo-Lag fire barriers for shutdown functions that are located 50 or more feet away from major in-situ combustibles. This use of fire barriers in outdoor configurations provides equivalent protection when compared to radiant energy shields in large indoor areas, such as the reactor containment. The exemption applies to all outdoor fire zones that employ Thermo-Lag fire barrier material at Turkey Point.

To our knowledge, other than at Turkey Point Plant, there has been little or no use of outdoor fire barrier configurations by other utilities within the industry. These outdoor areas are not subject to fire damage from stratified gases or ceiling jet layers that can occur from a fire in an indoor area. No reliance or credit has been taken for the indoor fire methodologies that were presented in our April 29, 1994, submittal.

The requested exemption satisfies the requirements of 10 CFR §50.12 in that it is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and presents special circumstances.

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FPL requests that this proposed exemption be given priority review by NRC staff and that the exemption be approved by September 30, 1994.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Plant

TFP/OIH

Attachment

cc: S. D. Ebneter, Regional Administrator, Region II, USNRC
T. P. Johnson, Senior Resident Inspector, USNRC, Turkey Point

EXEMPTION REQUEST FOR THE TURKEY POINT UNITS 3 AND 4 OUTDOOR FIRE AREA

I. Introduction

The purpose of this submittal is to request, in accordance with the provisions of Title 10 Code of Federal Regulations section 50.12 (10 CFR §50.12), "Specific exemptions," an exemption for Turkey Point Unit 3 and Unit 4 (Turkey Point) from provisions of subsections III.G.2.a and c of Appendix R to 10 CFR Part 50. Appendix R sets forth certain fire protection features pertinent to satisfying Criterion 3 of Appendix A to Part 50. The subsections of Appendix R referenced above address specific requirements for the protection of safe shutdown capability against fire.

Under 10 CFR §50.12 the NRC may, "upon application by any interested person or upon its own initiative, grant exemptions from the requirements of . . . regulations . . . ." As applied to the Commission's fire protection regulations by the D.C. Circuit Court of Appeals in Connecticut Light & Power v. NRC, 673 F.2d 525 (1982), section 50.12 provides, in effect, an alternative means of complying with certain provisions of Appendix R, including subsections III.G.2.a and c.

II. Discussion

A. Background

Pursuant to 10 CFR §50.48(a), each operating nuclear power plant must have a plan to satisfy Criterion 3, "Fire

protection," of Appendix A to 10 CFR Part 50. Under the terms of 10 CFR §50.48(b), "Appendix R . . . establishes fire protection features required to satisfy Criterion 3 of Appendix A . . . with respect to certain generic issues . . . ." In particular, subsections III.G.2.a and c of Appendix R address fire protection features for assuring safe shutdown capability. Specifically, subsection III.G.2.a allows the separation of cables and equipment and associated non-safety circuits of redundant trains of certain shutdown systems by a three-hour fire barrier as an acceptable means of protection; while subsection III.G.2.c allows the enclosure of cable and equipment and associated non-safety circuits in a one-hour fire barrier, with fire detectors and an automatic fire suppression system, as an acceptable alternative. In addition, 10 CFR §50.12 provides that:

> (a) The Commission may, upon application by an interested person or upon its own initiative, grant exemptions from the requirements of the regulations of this part, which are -
>
> (1) Authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security.
>
> (2) The Commission will not consider granting an exemption unless special circumstances are present . . . .

Application of this exemption procedure within the context of the Commission's fire protection regulations was considered by the D.C. Circuit Court of Appeals in the Connecticut Light case.

So applied, the court found that 10 CFR §50.12 provides, in effect, an alternative means of complying with certain fire protection requirements, including the options specified in subsections III.G.2.a and c for the protection of safe shutdown capability. Connecticut Light, 673 F.2d at 528-34. In the words of the court, "if the company can prove that another method works as well as one of the three stipulated by the NRC [in subsections III.G.2.a, b, and c], in light of the identified fire hazards at its plant, it may continue to employ that method." Connecticut Light, 673 F.2d at 534. As detailed below, FPL requests an exemption from the application of certain requirements of subsections III.G.2.a and c for the reasons stated in the specified bases.

B. Requested Exemption

Subsection III.G.2.a requires that cables, equipment, and associated non-safety circuits of redundant trains of certain shutdown apparatus in the same fire area be separated by a 3-hour fire barrier. As an alternative, subsection III.G.2.c requires that cable and equipment and associated non-safety circuits of a redundant train of certain shutdown apparatus in the same fire area be enclosed in a 1-hour fire barrier and that, in addition, fire detectors and an automatic suppression system be installed. Florida Power & Light Company (FPL) requests an exemption for Turkey Point Units 3 and 4 from the requirements of subsections III.G.2.a and c utilizing Thermo-Lag as a barrier material in

outdoor areas where the following conditions are met:

(1) As-installed fire barriers have a minimum rating of 30 minutes, based on test results and the NEI (NUMARC) Application Guide; and

(2) the fire barriers are not within 50 feet of a major in-situ combustible.

Special Characteristics of Outdoor Areas

Outdoor areas present special characteristics that mitigate the effects of fires. Fire damage from stratified hot gases or ceiling jet layers is not a concern in outdoor areas. The fire energy is not localized by physical boundaries and dissipates quickly with the large heat sink. Major in-situ combustibles in outdoor areas such as transformers and turbine lube oil reservoirs are contained and have automatic suppression systems. A 50-foot separation provides additional assurance that a fire from one of these sources would not challenge a 30-minute fire barrier.

Turbine Lube Oil Piping in Outdoor Areas

The components in the Turbine Lube Oil (TLO) system which contain major combustibles are the TLO reservoirs, filters, and the hydrogen seal oil units. For the protection of redundant safe shutdown capability, no 30-minute Thermo-Lag fire barriers will be allowed within 50 feet of these major sources. The balance of the TLO system includes a turbine control oil system, turbine auto stop oil system, and associated piping. The oil

systems are supplied by the turbine shaft-driven lube oil pump. This pump operates at about 380 psig. Oil is supplied to the shaft bearings at about 15 psig. The TLO system has annunciators that will alert operators to a high pressure lube oil pipe break, or other pressure loss related problems. These annunciators include:

Annunciator	Setpoint (psig)
Turbine Bearing Lube Oil Pressure (E 2/1)	8
Emergency Bearing Oil Pump Running (E 2/3)	7
Turbine Aux Oil Pump Running (E 4/1)	10
Guarded Oil Actuation (E 5/6)	2
Turbine Bearing Oil Low Pressure Trip (E 6/2)	5.5

There are no valves (potential leak locations) in the TLO piping under the turbine deck. The high pressure supply piping is encased in a low pressure (atmospheric) guard pipe which drains to the TLO sump. In the event of a leak in a high pressure TLO line, the leakage will be diverted to the TLO sump via the guard piping. Such a leak will cause turbine trip and/or turbine valve closures and/or control room annunciation.

Only a low pressure (atmospheric) TLO leak could occur in the open-air turbine building structure. A postulated leak in the low pressure/atmospheric lube oil piping would drain to the storm drain or sump system and would be discovered before any significant accumulation could occur. The TLO piping in the

turbine structure is covered by a wet pipe suppression system, hence, in the unlikely event that a postulated TLO spill ignites, it would be mitigated by the fire water suppression system.

This low leakage TLO piping design assures that the fire hazard is very low in TLO piping areas, hence the piping areas of the TLO system are not considered as major in-situ combustibles and safe shutdown related 30-minute Thermo-Lag fire barriers can be located within 50 feet.

Transient Combustible Control Program for Outdoor Areas

The Turkey Point Combustible Control Program does not allow storage of combustibles in outdoor areas that contain safety related equipment or cables. Procedures require that liquid flammable combustibles be attended at all times and a special permit is required for quantities greater than 5 gallons. Hence, transient combustible controls assure that a worst case transient fire caused by a spill would be far below a hazard level that could challenge a 30-minute fire barrier. As an example, a fire from a 20 gallon flammable transient spill (over ≈ 15 ft^2 area) would generate a fire with a duration less than 15 minutes. Initiation of a fire of this size would require multiple breakdowns of the plant transient combustible control processes. However, were these breakdowns to occur, there is still at least a factor of safety of two when compared to a 30-minute fire barrier located directly in the fire plume.

Additionally, the fire brigade response time for outdoor fires is less than 15 minutes which is well below a 30 minute fire barrier fire endurance rating.

Radiant Energy Shields and Equivalent Protection

Subsection III.G.2.f of Appendix R allows for the protection of safe shutdown equipment and cables in containment using radiant energy shields. This protective feature is appropriate given the fact that the containment is a large open area and energy build-up around a postulated fire is not credible. The requested exemption for outdoor areas provides protection for safe shutdown equipment and cables equivalent to that allowed by subsection III.G.2.f of Appendix R for the reactor containment. Outdoor area fire detection by plant staff and fire brigade response are equivalent to, and potentially better than, that for reactor containment. Additionally, 30 minute Thermo-Lag fire barriers can perform the functions of radiant energy shields. The NRC has provided concurrence with this use of fire barriers in Generic Letter 86-10:

> In our opinion, any material with a 1/2 hour fire rating should be capable of performing the required function of radiant energy shield. To the extent that an applicant can justify that a proposed radiant energy shield can achieve an equivalent level of safety, we have been accepting shields that have not been tested against the acceptance criteria of ASTM E119. We have accepted non-fire-rated radiant energy shields that have been demonstrated by fire hazards analysis to

provide an acceptable level of protection against the anticipated hazard of a localized fire within the containment. We have also accepted fire-rated metal-sheathed mineral insulated cables, as a radiant energy shield in specific configurations.

Given the identified fire hazards, this exemption method for outdoor areas provides protection equivalent to that of subsections III.G.2.a and c of Appendix R, and is comparable to the provisions of subsection III.G.2.f of Appendix R for protecting safe shutdown equipment and cables.

This exemption method will be used initially to evaluate the following Turkey Point outdoor fire zones:

TURKEY POINT OUTDOOR FIRE AREA

Fire Zone	Description
47	Unit 4 Component Cooling Pump and Heat Exchanger
54	Unit 3 Component Cooling Pump and Heat Exchanger
79	Outdoor Area West of Unit 4 Containment
80	Unit 4 Main Condenser Area
82	Unit 4 Auxiliary Transformer Area
83	Unit 3 Air Compressor Area
84	Units 3 & 4 Auxiliary Feedwater Pump Area
85	Unit 3 Main Condenser Area
86	Unit 3 Main Transformer and Startup Transformer
87	Unit 3 Auxiliary Transformer Area
88	Unit 3 Switchgear/Diesel Gen. Building Vestibule
89	Unit 3 Condensate Storage Tank Area
91	Unit 4 Condensate Pump Area
92	Unit 3 Condensate Pump Area
105	Units 3 & 4 Turbine Building Mezzanine Deck
106R	Units 3 & 4 Control Room Roof
113	Unit 4 Feedwater Platform
114	Unit 4 Main Steam Header Platform
115	Unit 3 Main Steam Header Platform
116	Unit 3 Feedwater Platform
117	Units 3 & 4 Turbine Deck
118	Units 3 & 4 Auxiliary Building Roof
119	Unit 4 Circulating Water Intake Structure
120	Unit 3 Circulating Water Intake Structure
143	Unit 3 Diesel Generator Building Roof

C. **Bases for Requested Exemption**

The requested exemption is consistent with the requirements of 10 CFR §50.12 and should be granted. First, in accordance with subsection 50.12(a)(1), it is clear from the foregoing discussion that the exemption sought by FPL for Turkey Point is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security.

Second, consistent with the requirements of subsection 50.12(a)(2), special circumstances are present. In particular, as discussed below, special circumstances exist within the terms of subsections 50.12(a)(2)(ii) and (iii).

Subsection 50.12(a)(2)(ii) -- Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule;

The purpose of the NRC's fire protection regulations is to help assure that structures, systems, and components important to safety are designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. The particular aspects of the regulations pertinent here concern the protection of systems associated with achieving and maintaining safe shutdown conditions. As discussed above in this request, grant of the exemption is consistent with preserving safe shutdown capability by assuring, through appropriate use of fire barrier material, that shutdown

capability will, in fact, be maintained. Accordingly, compliance with the particular terms of subsections III.G.2.a and c of Appendix R is not specifically required. [1] Thus, application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule.

Subsection 50.12(a)(2)(iii) -- Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated;

The costs contemplated when Appendix R was adopted were limited to those related to the installation of barrier material to meet specific barrier requirements. At that time, the Commission did not contemplate additional expenses that reactor licensees might incur to replace degraded barrier material that was once reasonably relied upon by the licensees as qualified. FPL has spent greater than ten million dollars on outdoor fire barriers at Turkey Point in order to satisfy the originally contemplated Appendix R barrier material requirements in the areas covered by this exemption request. FPL estimates that an additional amount of approximately five million dollars would be necessary to upgrade Thermo-Lag barriers. (This does not include

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[1] It should be noted that, to the extent the Connecticut Light decision provides, in effect, an alternative means for complying with fire protection requirements by incorporating the exemption provisions of 10 C.F.R. § 50.12 into the fire protection regulations, the approach being followed by FPL provides for compliance with those regulations. See discussion in Section II.A, above.

increased costs related to the extended outage that might be necessary to implement the upgrades.) Thus, strict compliance by FPL with the Commission's fire protection regulations would result in costs significantly in excess to those originally contemplated.

III. Summary and Conclusion

Subsections III.G.2.a and c of Appendix R to 10 CFR Part 50 address fire protection features for assuring safe shutdown capability. Exemptions are provided under the provisions of 10 CFR §50.12 and, in effect, have been made a part of the fire protection regulations through the D.C. Circuit Court of Appeals decision in Connecticut Light. The exemption requested in Section II.B, above, is consistent with section 50.12 of the Commission's regulations in that it is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and presents special circumstances. Accordingly, the requested exemption should be granted.