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

SUBJECT: Informs that util will aggressively pursue implementation of fire barrier mods during 1997 outages & will complete remaining items during subsequent refueling outages scheduled for Sept 1988 on Unit 3 & March 1999 on Unit 4.

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FPL

SEP 27 1996

L-96-236
10 CFR §50.54(f)
10 CFR Part 50 Appendix R

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

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Thermo-Lag 330-1 Fire Barriers -
Description of Fire Barrier Modifications

By letter L-95-300, dated November 15, 1995, Florida Power and Light Company (FPL) provided the NRC Staff with the plans for resolution of fire barrier issues at Turkey Point Units 3 and 4. FPL indicated that a summary description of the indoor fire areas, excluding containment, modification material selection and installation design would be provided to the NRC staff by the end of the third quarter of 1996. Attached is FPL's summary description of the modification material selection and installation design for Turkey Point Units 3 and 4 indoor fire areas excluding containment. In addition, a description of the fire barrier systems modifications for inside containment areas is also provided. The modifications to indoor conduit fire barrier systems and for inside containment at Turkey Point described in the attachment will satisfy Subsections III.G.2.a, c, or f of Appendix R to 10 CFR Part 50 for one hour and three hour fire barriers, and radiant energy shields, to ensure safe shutdown capability..

By letter L-95-300, FPL indicated that NRC review and approval of the indoor fire area, excluding containment, modification material selection and installation design would be requested prior to modification implementation. Since the indoor one hour and three hour fire barrier modifications are being designed to meet the requirements of Appendix R to 10 CFR Part 50, and the modification design is based on fire barrier qualification from industry testing, NRC review and approval is not requested. FPL plans to proceed with the design and commence implementation of the fire barrier modifications for the indoor areas in 1997 and for containment areas during the next refueling outages currently scheduled for March 1997 on Unit 3 and September 1997 on Unit 4. FPL will aggressively pursue implementation of these modifications during the 1997 outages, and will complete any remaining items during the subsequent refueling outages currently scheduled for September 1998 on Unit 3 and March 1999 on Unit 4.

Very truly yours,

T. F. Plunkett
President
Nuclear Division

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OIH

Attachment

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

070094

L-96-236
Thermo-Lag 330-1 Fire Barriers -
Description of Fire Barrier Modifications

STATE OF FLORIDA)
) ss.
COUNTY OF ~~WEST PALM BEACH~~)
Dade JK 9-27-96

T. F. Plunkett being first duly sworn, deposes and says:

That he is President, Nuclear Division, of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

T. F. Plunkett

Subscribed and sworn to before me this
27th day of September, 1996.

J. E. KNORR
Name of Notary Public (Type or Print)

JAMES E. KNORR
MY COMMISSION # CC 434300
EXPIRES: January 22, 1999
Bonded Thru Notary Public Underwriters

NOTARY PUBLIC, in and for the County of Dade, State of Florida

T. F. Plunkett is personally known to me.

ATTACHMENT TO L-96-236

FIRE BARRIER MODIFICATION DESCRIPTION
FOR TURKEY POINT UNITS 3 AND 4
INDOOR FIRE AREAS AND FOR CONTAINMENT

1.0 INTRODUCTION

The purpose of this submittal is to inform the NRC of the planned modifications for indoor area and for containment electrical raceway fire barriers at Turkey Point Units 3 and 4, in accordance with the actions identified in FPL letter L-95-300, dated November 15, 1995. Raceway fire barrier modifications are designed to satisfy the separation requirements for the protection of safe shutdown capability against fire, in accordance with 10 CFR Part 50 Appendix R Sections III.G.b.2.a, c, or f.

The NRC determined that there were deficiencies in the design, testing and installation of TSI Thermo-Lag 330-1 electrical raceway fire barrier system, as documented in NRC Bulletin 92-01 and Generic Letter 92-08. The two primary concerns were:

1) The currently installed Thermo-Lag 330-1 fire barrier may not ensure that the electrical cables are free from fire damage for the required rating pursuant to Appendix R, and;

2) The ampacity derating factors currently used for Thermo-Lag 330-1 may not be correct. (Reference 2 addresses this item for the currently installed Thermo-Lag configurations).

Since Thermo-Lag 330-1 has been utilized in the design of FPL Turkey Point Units 3 and 4 to protect redundant cables required for safe shutdown in the event of a fire, corrective actions are required to satisfy the aforementioned sections of Appendix R.

Per NRC Information Notice IN 92-82, "Results of Thermo-Lag 330-1 Combustibility Testing," the NRC Staff concluded that Thermo-Lag 330-1 is a combustible material. 10 CFR Part 50 Appendix R, Section III.G.2.f precludes the use of combustible materials to provide radiant energy heat shield protection for shutdown components inside containments. Since Thermo-Lag 330-1 has been utilized inside the containments of FPL Turkey Point Units 3 and 4 to protect cables required for safe shutdown in the event of a fire, corrective actions are required to satisfy the aforementioned section of Appendix R.

2.0 INDOOR FIRE BARRIER MATERIAL SELECTION (EXCLUDING CONTAINMENT)

An evaluation was performed to compare the installed fire barrier configurations at Turkey Point with those configurations qualified by industry fire endurance testing for Thermo-Lag 330-1 and overlay with Thermo-Lag 770-1. The results of the evaluation determined the design upgrades needed to achieve the required barrier rating at Turkey Point.

The evaluation assessed the following items for indoor Thermo-Lag 330-1 raceway fire barrier system applications at Turkey Point:

Applicability of previous industry fire endurance testing to bound existing, i.e., "as-installed", barrier system configurations.

Determination of whether design upgrades are necessary to achieve the required barrier rating, including identification of appropriate

designs which have been qualified by test.

Assessment of barrier system attributes which either differ from those qualified by test or have not been specifically tested.

A summary description of the planned modifications for indoor areas, excluding containment, is provided in the following section.

3.0 DESCRIPTION OF PLANNED MODIFICATIONS FOR INDOOR FIRE BARRIERS (EXCLUDING CONTAINMENT)

3.1 Raceways Requiring One Hour Fire Barriers

For raceways required to be upgraded to achieve 1-hour rated fire endurance capability, configurations qualified by testing that were found to meet the requirements of a one hour fire barrier will serve as the basis for the upgraded barrier system design (NEI Test 1-6, Reference 1). The barrier system qualified by NEI Test 1-6 for the larger conduits utilizes reinforcement of all joints between the existing Thermo-Lag 330-1 pre-shaped conduit sections and prefabricated panels with a layer of Thermo-Lag 330-69 stress skin and application of Thermo-Lag 330-1 trowel grade material. Other configurations which were also qualified for a one hour fire barrier utilize a nominal 3/8 inch Thermo-Lag 330-1 overlay over the nominal 5/8 inch first layer.

3.2 Raceways Requiring Three Hour Fire Barriers

3.2.1 Conduit Systems

The upgraded 3-hour Thermo-Lag fire barrier systems tested by Reference 3 were determined to be qualified for use on 1 inch through 4 inch diameter steel conduit systems and associated fitting enclosures such as condulets, pull boxes, radial bends etc. The planned upgrade modification consists of:

1 1/4 inch thick base layer of Thermo-Lag 330-1 prefabricated material with three (3) layers of Thermo-Lag 770-1 mat overlays, for 1 1/4 inch and smaller conduit systems, and;

1 1/4 inch thick base layer of Thermo-Lag 330-1 prefabricated material with two (2) layers of Thermo-Lag 770-1 mat overlays, for 2 inch and larger conduit systems.

3.2.2 Protection of Primary Raceway Support Members

The existing 1 1/4 inch thick Thermo-Lag 330-1 coverage installed on primary support members associated with protected raceways will require upgrade by installing a single layer of Thermo-Lag 770-1 mat overlay to maintain acceptable temperatures of raceway support steel members, and reinforcement of the Thermo-Lag panels on the base plate surfaces.

3.2.3 Coverage on Intervening Commodities and Interferences

Existing 3-hour "intervening commodity" protection at Turkey Point is installed for an 18 inch minimum distance along the intervening commodity. Upgrading the existing 1 1/4 inch (nominal) Thermo-Lag 330-1 fire barrier coverage on intervening commodities with two (2) layers of Thermo-Lag 770-1 flexible mat material for 18 inches will effectively preclude thermal short conditions from adversely affecting the enclosed essential circuits and provide the required fire endurance rating of 3 hours.

FPL plans to utilize the following options to provide essential raceways and enclosed circuits the required upgrade of either two (2) or three (3) layers of Thermo-Lag 770-1 flexible mat material to ensure a fire endurance rating of 3 hours.

1) Where feasible and cost effective, modify the interfering commodity in order to provide the required space to install the fire barrier upgrade.

2) Where available space permits, Thermo-Lag 770-1 mat may be compressed through the area of interference in order to maintain an uninterrupted fire barrier, without cutting or tearing.

3) Reduce the existing Thermo-Lag 330-1 material thickness to no less than 5/8 inch in order to provide sufficient space to install the required layers of Thermo-Lag 770-1 through the area of interference.

3.2.4 Use of Topcoat Formulations Over Existing Thermo-Lag 330-1

Although the qualification tests performed for 3-hour upgraded Thermo-Lag fire barrier systems did not include topcoat of Thermo-Lag 330-1 base layer material, the presence of topcoat will not compromise the ability of these barrier systems to provide the required fire endurance rating of 1 or 3 hours.

Fire endurance tests have been performed which demonstrate that the topcoat formulations have no effect on the performance of Thermo-Lag 330-1 fire barriers when directly exposed to fire test conditions. Industry testing (Reference 5) in 1-hour applications demonstrated satisfactory performance and bounds anticipated upgrades to 1-hour fire barrier systems.

In 3-hour applications, the performance margin and visual observations of Thermo-Lag 770-1 upgrades to existing Thermo-Lag 330-1 base systems demonstrate that significant quantities of the underlying Thermo-Lag 330-1 material is unreacted. Sufficient oxygen is not expected to be present within the composite barrier system to support combustion of the topcoat. It is concluded that the presence of topcoat will not compromise the ability of these barrier systems to provide a fire endurance rating of 3-hours.

On this basis, where topcoat has been applied at Turkey Point, removal of topcoat is not required prior to upgrade of existing barrier systems.

3.2.5 Alternate Construction Methods For Thermo-Lag Fire Barrier "Box Design" Enclosures

Based on existing test results, upgrade of existing "box design" enclosures mounted against concrete surface using two layers of Thermo-Lag 770-1 mat is qualified for 3-hours rated fire endurance capability utilizing a picture frame or border panel design. Additionally, alternate construction techniques such as eliminating longitudinal seam overlaps and omission of external stress skin to completely encapsulate the base Thermo-Lag 330-1 material layer are acceptable alternatives FPL may utilize as part of the upgrade modification.

3.2.6 Ampacity Derating

FPL will address the ampacity derating of raceways upgraded with the Thermo-Lag 770-1 fire barrier system. The evaluation will be based on testing performed for other utilities on 1 inch and 4 inch conduit with three hour fire barriers (Reference 6), as it affects the ampacity derating evaluations already documented by FPL. The effect of the Thermo-Lag 330-1 one hour upgrade modification on ampacity derating will be evaluated using the same methodology already documented by FPL (Reference 2).

4.0 CONTAINMENT MATERIAL SELECTION AND DESCRIPTION OF PLANNED MODIFICATIONS

Based on the amount and types of installed Thermo-Lag 330-1 inside containment, modification by overlaying the Thermo-Lag 330-1 with stainless steel sheet metal is planned. The vapor proof/water proof stainless steel sheet metal is a non-combustible material, which when overlaid on the existing Thermo-Lag 330-1, will combine to form a non-combustible radiant energy shield. A similar modification, implemented at Crystal River Unit 3, has been accepted by the NRC staff.

5.0 SUMMARY AND CONCLUSION

The proposed modifications to indoor conduit fire barrier systems, excluding containment, at Turkey Point described above will satisfy Subsections III.G.2.a or c of Appendix R to 10 CFR Part 50, to ensure safe shutdown capability. The modification design is based on fire barrier qualification from existing industry testing. Where direct comparison of the planned modifications to tested configurations was not available, the test data was analyzed to justify the modification FPL plans to utilize.

The planned modifications to containment radiant energy shields at Turkey Point described above will satisfy Subsection III.G.2.f of Appendix R to 10 CFR Part 50, to ensure safe shutdown capability.

6.0 REFERENCES

1. Omega Point Laboratories Project No. 13890-95676, "Fire Endurance Test of a Thermo-Lag 330-1 Fire Protective Envelope, Test 1-6 (5 in., 3 in. & 3/4 in. Aluminum and 3 in. Steel Conduit Assemblies)," prepared for Nuclear Utility Management and Resource Council, November 11, 1993.
2. FPL letter to USNRC L-96-150, "Turkey Point Units 3 and 4, Docket Nos. 50-250 and 50-251, Response to the Follow-Up Request for Additional Information - Generic Letter 92-08, Thermo-lag 330-1 Fire Barriers", dated 6/28/96.
3. Omega Point Laboratories Project No. 11960-97553, "Fire Endurance Test of Thermo-Lag 330-1 Fire Protective Envelopes (12 in. and 24 in. Cable Trays, and 5 in., 2 in. and 1 in. Steel Conduits)," prepared for Tennessee Valley Authority, January 31, 1995.
4. Omega Point Laboratories Project No. 11960-97555, "Fire Endurance Test of Thermo-Lag 330-1 Fire Protective Envelopes (12 in. and 24 in. Cable Trays, and a 12 in. x 12 in. x 60 in. Junction Box)," prepared for Tennessee Valley Authority, January 31, 1995.
5. Omega Point Laboratories Project No. 12340-95769, "Fire Endurance Test of a Thermo-Lag 330-1 Fire Protective Envelope (12 in. Cable Tray and 2 in. Conduit) Scheme 13 Assembly 2," prepared for TU Electric, August 23, 1993.
6. Omega Point Laboratories Project No. 11960-97337 and -97338, "Ampacity Derating of Cables Enclosed in Conduit with Thermo-Lag 330-1/770-1 Upgrade Electrical Raceway Fire Barrier System (ERFBS)", prepared for TVA, August 21, 1995.