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

SUBJECT: Forwards response to GL 92-08, "Thermo-Lag 330-1 Fire Barriers." Five tray sections requiring protection w/ Thermo-Lag 330-1 & containing power cables found to have ample margin over worst case evaluated for 3 h trays.

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TITLE: Generic Letter 92-008 Thermal-Log 330 Fire Barrier

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APR 06 1993

L-93-75
10 CFR 50.54(f)

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

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to Generic Letter 92-08
Thermo-Lag 330-1 Fire Barriers

Generic Letter (GL) 92-08 was issued by the NRC on December 17, 1992, to obtain additional information from licensees to verify that Thermo-Lag 330-1 fire barrier systems manufactured by Thermal Science, Incorporated (TSI, the vendor), St. Louis, Missouri, comply with NRC requirements.

In accordance with the GL, Florida Power and Light Company (FPL) provides the attached response relative to the Turkey Point Plant. The attached information is provided pursuant to the requirements of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f).

Should there be any questions concerning this response, please contact us.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Nuclear

TFP/OIH

Attachment

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Ross C. Butcher, Senior Resident Inspector, USNRC,
Turkey Point Nuclear Plant

120070

A029 1/1

STATE OF FLORIDA)
) ss.
COUNTY OF DADE)

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

That he is Vice President, Turkey Point Nuclear, 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

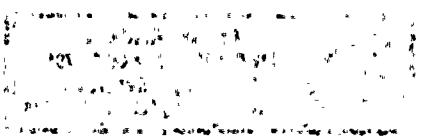
Subscribed and sworn to before me this 5 day of APRIL, 1993.

Name of Notary Public (Type or Print)
NOTARY PUBLIC, in and for the County of Dade, State of Florida

CHERYL A. KELLY
MY COMMISSION # CC 223781
EXPIRES: September 27, 1996
Bonded Thru Notary Public Underwriters

My Commission expires
Commission No.

T. F. Plunkett is personally known to me.



NRC GENERIC LETTER 92-08
THERMO-LAG 330-1 FIRE BARRIERS

Background

The NRC issued this generic letter to obtain additional information from licensees to verify that Thermo-Lag 330-1 fire barrier systems manufactured by Thermal Science, Incorporated (TSI, the vendor), St. Louis, Missouri, and installed by the licensees comply with NRC requirements. The NRC had three principal areas of concern: the fire endurance capability of Thermo-Lag 330-1 barriers, the ampacity derating of cables enclosed in Thermo-Lag 330-1 barriers, and the evaluation and application of the results of tests conducted to determine the fire endurance rating and the ampacity derating factors of Thermo-Lag 330-1 barriers. Licensees were requested to confirm (1) that the Thermo-Lag 330-1 barrier systems have been qualified by representative fire endurance tests, (2) that the ampacity derating factors have been derived by valid tests, and (3) that these qualified barriers have been installed with appropriate procedures and quality controls to ensure that they comply with NRC requirements.

Requested Action

1. State whether Thermo-Lag 330-1 barriers are relied upon
   (a) to meet 10 CFR 50.48, to achieve independence of electrical systems,
   (b) to meet a condition of a plant's operating license, or
   (c) to satisfy a licensing commitment.

   If applicable, state that Thermo-Lag 330-1 is not used at the facility. This generic letter applies to all 1-hour and all 3-hour Thermo-Lag 330-1 materials and barrier systems assembled by any assembly method such as by assembling preformed panels and conduit shapes, as well as spray, trowel and brush-on applications.

FPL Response

1. (a) Turkey Point Units 3 and 4 were licensed to operate prior to January 1, 1979, and are required to meet 10 CFR 50.48 and 10 CFR 50, Appendix R, Sections III.G, J and O. Thermo-Lag 330-1 material was used for raceway fireproofing to meet all the separation requirements of 10 CFR 50, Appendix R, Section III.G.

   (b) Not applicable to Turkey Point Units 3 and 4.

   (c) See (a)

Requested Action

2. If Thermo-Lag 330-1 barriers are used at the facility,

(a) State whether or not the licensee has qualified the Thermo-Lag 330-1 fire barriers by conducting fire endurance tests in accordance with the NRC's requirements and guidance or licensing commitments.

FPL Response

2.(a) FPL has not performed, nor contracted to perform, any fire endurance testing of the Thermo-Lag 330-1 material. FPL accepted the material qualification testing performed by ITL (Industrial Testing Laboratories), TSI (Thermal Science Inc.) and SWRI (Southwest Research Inc.). The SWRI testing is referenced in NRC correspondence to Texas Utilities Generating Company, R.L. Tedesco to R.J. Gary, dated December 1, 1981.

ITL Report Nos. 82-11-80, November 1982, "One-hour fire endurance tests conducted on test articles containing "Generic" Cables protected with Thermo-Lag 330-1 subliming coating envelope system", and 82-11-81, November 1982, "Three-hour fire endurance tests conducted on test articles containing "Generic" Cables protected with Thermo-Lag 330-1 subliming coating envelope system", in conjunction with the above NRC Thermo-Lag acceptance letter dated December 1, 1981, formed the basis of the FPL qualification. NRC review and acceptance of the FPL implementation procedure is documented in NRC Fire Protection Team Inspection, Report No. 50-250/251/89-37 dated 01/04/90, which specifically reviewed the use of Thermo-Lag 330-1 fire barriers at Turkey Point and the application of a qualification test report.

Based on recent NRC concerns and investigations into the performance of Thermo-Lag 330-1 material (particularly, Thermo-Lag's sensitivity to installation details) and the conduct of prior tests that were used as basis for qualification, the NRC has now specifically declared a number of the previous tests, and their corresponding installations as indeterminate. The fire barriers at Turkey Point will ultimately be evaluated and qualified in accordance with the new guidance.

Requested Action

(b) State

(1) whether or not the fire barrier configurations installed in the plant represent the materials, workmanship, methods of assembly, dimensions, and configurations of the qualification test assembly configurations; and

(2) whether or not the licensee has evaluated any deviations from the tested configurations.

FPL Response

2.(b)(1) The Thermo-Lag 330-1 raceway fire barrier assemblies are installed (at a minimum) to the vendor installation instructions (TSI TECHNICAL NOTE 20684, Revision V). Quality Control inspections are performed during the installation process to ensure the quality of the end product.

An assessment was performed by an independent fire protection engineer of Thermo-Lag 330-1 use at Turkey Point. The assessment consisted of reviewing the FPL installation instructions and vendor test reports, personnel interviews and field walkdowns by the fire protection engineer. The assessment concluded that the Thermo-Lag installations at Turkey Point Units 3 and 4 are consistent with the manufacturer's installation instructions and the configurations described in the reviewed test reports. Based on the above, it was concluded that the Turkey Point configurations are bounded by the qualification test assembly configurations.

2.(b)(2) Evaluations performed in accordance with Generic Letter 86-10, Enclosure 2, Item 3.2.2, "Deviations from Tested Configurations" are on file at the site for NRC review.

Requested Action

(c) State

(1) whether or not the as-built Thermo-Lag 330-1 barrier configurations are consistent with the barrier configurations used during the ampacity derating tests relied upon by the licensee for the ampacity derating factors used for all raceways protected by Thermo-Lag 330-1 (for fire protection of safe shutdown capability or to achieve physical independence of electrical systems) and

(2) whether or not the ampacity derating test results relied upon by the licensee are correct and applicable to the plant design.

FPL Response

2.(c)(1) Turkey Point protects conduits and trays with raceway fire proofing. The following ampacity derating tests for conduits and trays substantiate the Turkey Point design:

CONDUITS:
Ampacity derating tests performed by TSI/ITL indicate the following for conduits:

(a) Test 111781, 10/81 on a 2" steel conduit with a one hour fire barrier determined a 7.47 % derating due to the Thermo-Lag.
(b) Test 84-10-5, 10/84 on a 2" steel conduit with a three hour fire barrier determined a 9.72 % derating due to the Thermo-Lag.

Ampacity derating tests performed by Underwriter's Laboratory (UL) indicate the following for conduits:

(a) Test 86NK23826, 1/87 on 4" steel conduit with a one hour Thermo-Lag fire barrier determined a 0.0 % ampacity derating (ie: within the accuracy of the test).
(b) Test 86NK23826, 1/87 on 4" steel conduit with a three hour Thermo-Lag fire barrier determined a 9.4 % ampacity derating.

Conduits requiring protection with Thermo-Lag 330-1, for both one and three hour fire protection, and containing power cables at Turkey Point, have been evaluated. After applying a 10 % derating factor for all the Thermo-Lag enclosed conduits, the remaining worst case ampacity derating margin is 55 %. This provides a substantial margin over the circuit's ampacity requirements.

TRAYS:
Ampacity derating tests performed by TSI/ITL indicate the following for trays:

(a) Test 82-355-F1, 1/85 on a 14 inch wide solid bottom steel cable tray with a 1 hour Thermo-Lag 330-1 fire barrier determined a 12.5 % derating factor.

(b) Test 84-3-275A, 1/84 on a 12 inch wide solid bottom steel cable tray with a 3 hour Thermo-Lag 330-1 fire barrier determined a 20.55 % derating factor.

Ampacity derating tests performed by UL indicate the following for trays:

(a) Test 86NK23826, 1/87 on a 24 inch wide open-ladder steel cable tray with a 1 hour Thermo-Lag 330-1 fire barrier determined a 28.04 % derating factor.

(b) Test 86NK23826, 1/87 on a 24 inch wide open-ladder steel cable tray with a 3 hour Thermo-Lag 330-1 fire barrier determined a 31.15 % derating factor.

The five tray sections (< 120 linear feet) requiring protection with Thermo-Lag 330-1 and containing power cables at Turkey Point have been evaluated, and found to have a worst case ampacity derating margin (after applying a 22.6 % derating factor, 110% of the 20.55%, for the Thermo-Lag) of 57 %. This provides an ample margin over the worst case evaluated for the 3 hour Thermo-Lag 330-1 protected trays. This evaluation was performed prior to the UL testing. However, a 48 % margin still exists using derating factors available for the higher UL tested derating.

2.(c)(2) FPL is aware of the NRC concern regarding the apparent inconsistent ampacity derating results on cable trays. One of the Nuclear Management and Resources Council (NUMARC) tasks under the Thermo-Lag issue is to perform additional ampacity derating tests (on conduit and cable trays) to resolve this issue. NUMARC is working with the NRC on an acceptable test methodology. When the testing is completed and accepted by the NRC, FPL will evaluate the results relative to each application of Thermo-Lag at Turkey Point.

Requested Action

3. With respect to any answer to items 2(a), 2(b), or 2(c) above in the negative,

(a) describe all corrective actions needed and include a schedule by which such actions shall be completed and

(b) describe all compensatory measures taken in accordance with the technical specifications or administrative controls. When corrective actions have been completed, confirm in writing their completion.

FPL Response

3. (a) FPL is supporting the NUMARC effort of coordinating a testing program to resolve the fire rating and ampacity issues related to the fire barrier assemblies. The schedule for this testing is being provided to the NRC by NUMARC. The necessary corrective actions or the options for corrective actions cannot be ascertained until this testing is completed and the results found acceptable by the NRC. FPL will respond with a specific plant action plan after the NRC approval of the NUMARC test results.

(b) Per our response to NRC Bulletin 92-01 and Supplement #1 to NRC Bulletin 92-01, Turkey Point Plant has been providing compensatory measures. These compensatory measures have been found acceptable by the NRC.

Requested Action

4. List all the Thermo-Lag barriers for which answers to item 2 cannot be provided in the response due within 120 days from the date of this generic letter, and include a schedule by which such answers shall be provided.

FPL Response

4. Answers are provided for all sections of item 2.

Requested Action

The licensee should retain all documentation of any reviews performed to satisfy the reporting requirements for future NRC audits or inspections.

If the addressee cannot submit the information required or meet the reporting deadline, it shall include in the response due within 120 days from the date of this generic letter, a justification, a description of any proposed alternative approaches, and a schedule under which responses and proposed actions will be completed. The NRC encourages licensees to work together to develop acceptable generic solutions to the problems addressed in this generic letter.

FPL Response

FPL is currently an active participant in the NUMARC Ad Hoc Advisory Committee on Thermo-Lag. As NUMARC provides NRC-reviewed industry guidance for the resolution of the Thermo-Lag issues, FPL will formulate an action plan.