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 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co.      05000335  
 50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co.      05000389  
 AUTH. NAME      AUTHOR AFFILIATION  
 SAGER, D.A.      Florida Power & Light Co.  
 RECIPIENT NAME      RECIPIENT AFFILIATION  
                                  Document Control Branch (Document Control Desk)

SUBJECT: Forwards response to GL 92-08, "Thermo-Lag 330-1 Fire Barriers." Thermo-Lag 330-1 raceway fire barrier assemblies installed, as min, to vendor installation instructions. Util currently working w/NUMARC & NRC to resolve GL issues.

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

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April 16, 1993

L-93-96  
10 CFR 50.4  
10 CFR 50.54 (f)

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

RE: St. Lucie Unit Nos. 1 and 2  
Docket No. 50-335 and 50-389  
Generic Letter 92-08 Response

The Florida Power and Light Company (FPL) response to Generic Letter (GL) 92-08 "Thermo-Lag 330-1 Fire Barriers" for St. Lucie Units 1 and 2 is attached.

The 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).

Please contact us if there are any questions about this submittal.

Very truly yours,

*D.A. Sager*  
D. A. Sager  
Vice President  
St. Lucie Plant

DAS/GRM/kw

DAS/PSL #895-93

Attachments

cc: Stewart D. Ebnetter, Regional Administrator, Region II, USNRC  
Senior Resident Inspector, USNRC, St. Lucie Plant

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St. Lucie Unit Nos. 1 and 2  
Docket No. 50-335 and 50-389  
Generic Letter 92-08 Response

STATE OF FLORIDA            )  
  )  
COUNTY OF ST. LUCIE        )            ss.

D. A. Sager being first duly sworn, deposes and says:

That he is Vice President, St. Lucie Plant for the Nuclear Division of Florida Power & 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.

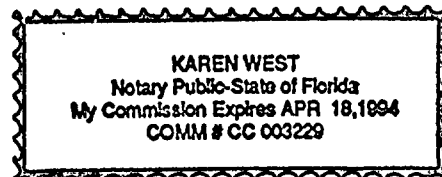
  
\_\_\_\_\_  
D. A. Sager

STATE OF FLORIDA  
COUNTY OF ST. LUCIE

The foregoing instrument was acknowledged before

me this 16<sup>th</sup> day of APRIL, 1993  
by D. A. Sager, who is personally known to me  
and who did take an oath.

  
\_\_\_\_\_  
KAREN WEST  
Name of Notary Public



My Commission expires 4-18-94

Commission No. CC003229

KARIN WIT  
New York - 212-850-1111  
My Central Records - 1984  
CO. RECORDS

ATTACHMENT

Background

The NRC issued this generic letter (GL) 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. The NRC had three principal areas of concern: (1) the fire endurance capability of Thermo-Lag 330-1 barriers, (2) the ampacity derating of cables enclosed in Thermo-Lag 330-1 barriers, and (3) 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. The GL response was due within 120 days of December 17, 1992.

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) Since St. Lucie Unit 1 was licensed to operate prior to January 1, 1979, the requirements of 10 CFR 50.48 and 10 CFR 50, Appendix R, Sections III.G, J and O are applicable to this unit. FPL used Thermo-Lag 330-1 material to achieve independence of electrical systems during the implementation of these requirements. Thermo-Lag 330-1 was used for raceway fireproofing and for a

number of walls and wall sections to meet the separation requirements.

(b) Not applicable.

(c) St. Lucie Unit 2 was licensed in April, 1983. FPL committed to meeting the technical requirements of 10 CFR 50, Appendix R, as part of the operating license review. The commitments are documented in the NRC Safety Evaluation Report related to the operation of St. Lucie Unit No. 2 (NUREG-0843) dated October 1981) and its supplements. Thermo-Lag 330-1 was used to achieve independence of electrical systems during the implementation of these commitments. The implementation schedule commitments were a condition of the plant operating license.

FPL committed to the intent of Regulatory Guide 1.75 for St. Lucie Unit 2. Thermo-Lag 330-1 was used on conduits during the implementation of these requirements.

#### 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) Florida Power and Light Company 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 Incorporated) and SWRI (Southwest Research Incorporated). The SWRI testing is referenced in NRC correspondence to Texas Utilities Generating Company, R.L. Tedesco to R.J. Gary, dated December 1, 1981.

FPL used the following ITL Test Reports: (1) Report No. 82-11-80, dated November 1982, "One-hour fire endurance tests conducted on test articles containing "Generic" Cables protected with Thermo-Lag 330-1 subliming coating envelope system"; (2) Report No. 82-3-2, dated February 4, 1982, "Three Hour ASTM E119 Fire Endurance Test to Qualify the Thermo-Lag 330-1 Conformable Three Hour Stress Skin Fire Wall System as a Nuclear Fire Wall"; and (3) Report No. 82-11-81, dated November 1982, "Three-hour fire endurance tests conducted on test articles containing "Generic" Cables protected with Thermo-Lag 330-1 subliming coating envelope system". These reports in conjunction with the above referenced NRC Thermo-Lag

330-1 acceptance letter dated December 1, 1981, formed the basis of the FPL qualification. NRC review and acceptance of the FPL implementation was documented by an NRC Fire Protection Team Inspection in Report No. 335/389 85-06 dated April 22, 1985. During this inspection NRC regional and headquarters inspectors specifically reviewed the use of Thermo-Lag 330-1 fire barriers at St. Lucie and the application of the qualification test reports.

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

#### Requested Action

##### (b) State

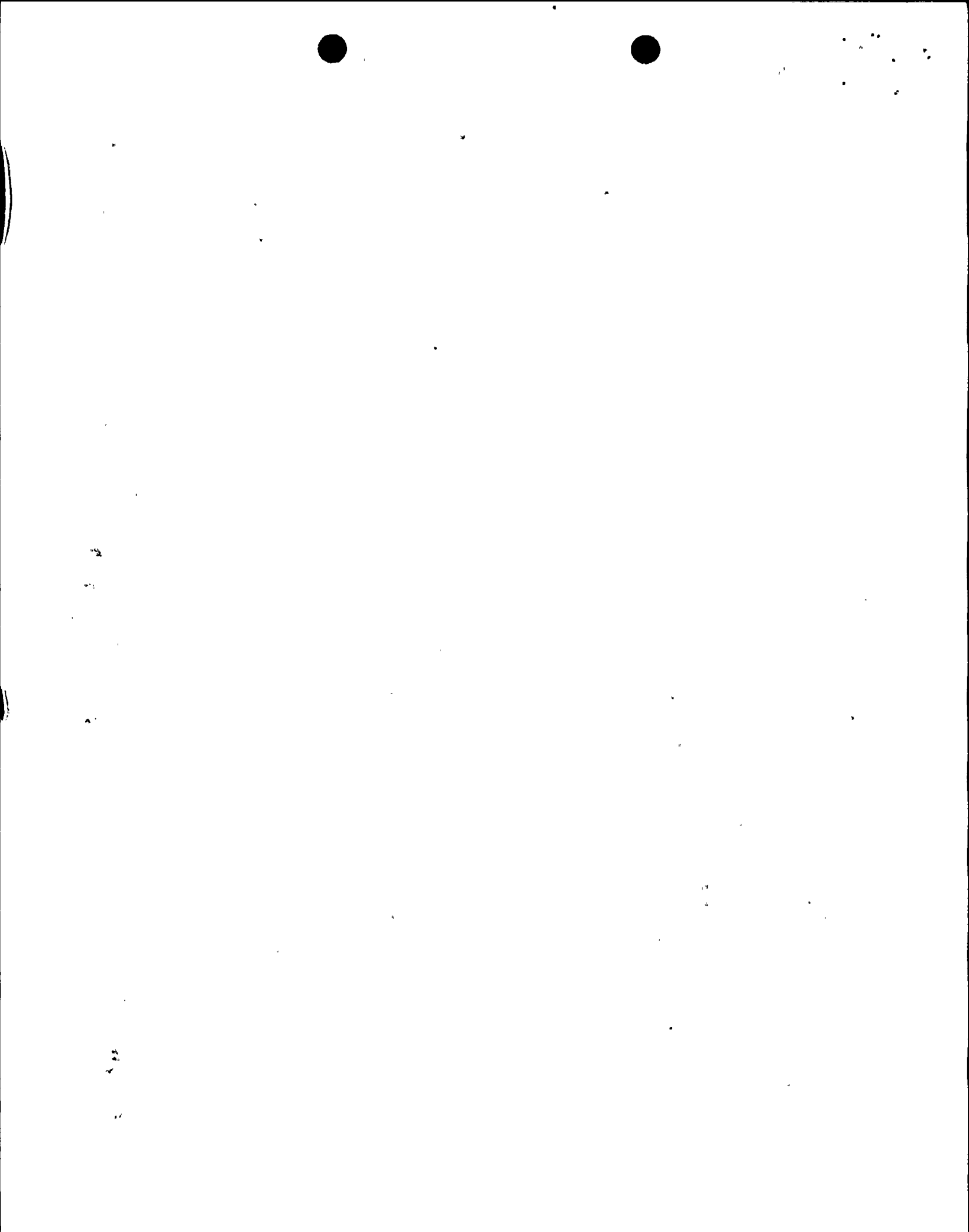
- (1) whether or not the fire barrier configurations installed in the plant represent the materials, workmanship, methods or assembly, dimensions, and configurations of the qualification test assembly configurations; and
- (2) whether or not the licensee has evaluated any deviations from the tested configurations.

#### FPL Response

2. (b) (1) The Thermo-Lag 330-1 raceway fire barrier assemblies are installed (as a minimum) to the vendor installation instructions (TSI TECHNICAL NOTE 20684, dated April 23, 1984). The Thermo-Lag 330-1 was installed under an approved site quality assurance program for fire protection. The installers of Thermo-Lag 330-1 were trained in accordance with the vendors training instructions (TSI Technical Note 411-84A), and quality control inspections were performed during the installation process to ensure the quality of the end product.

An assessment of Thermo-Lag 330-1 usage at St. Lucie, was performed by an independent fire protection engineer. The assessment consisted of reviewing the FPL installation instructions and vendor test reports, personnel interviews, and field walkdowns. The assessment concluded that the Thermo-lag 330-1 installations at St. Lucie Units 1 & 2 were consistent with the manufacturers installation instructions and the





configurations described in the reviewed test reports. Based on the above, it was concluded that the St. Lucie configurations were bounded by the qualification test assembly configurations.

- 2.(b)(2) No. The Thermo-Lag 330-1 was installed under an approved site QA program which was in compliance with the vendors installation instructions. Additionally, the walkdowns mentioned in response 2.(b)(1) confirmed the installation was in accordance with the vendor installation instructions.

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) St. Lucie Plant only protects conduits (no trays), with regard to raceway fire proofing. The following ampacity derating tests for conduits are applicable to the St. Lucie design:

TSI/ITL Tests:

- (a) Test 111781, dated October 1981, on a 2 inch steel conduit with a one hour fire barrier determined a 7.47% derating due to the Thermo-Lag 330-1.
- (b) Test.84-10-5, dated October 1981, on a 2 inch steel conduit with a three hour fire barrier determined a 9.72% derating due to the Thermo-Lag 330-1.

Underwriters Laboratory (UL) Tests:

- (a) Test 86NK23826, dated January 1987, on 4 inch steel conduit with a one hour Thermo-Lag 330-1 fire barrier determined a 0.0% ampacity derating (ie: within the accuracy of the test).
- (b) Test 86NK23826, dated January 1987, on 4 inch steel conduit with a three hour Thermo-Lag 330-1 fire



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barrier determined a 9.4% ampacity derating (ie: within the accuracy of the test).

The UL tests were performed after the St. Lucie design, but the results fall within the TSI/ITL results. All the power circuits routed in conduits protected with Thermo-Lag 330-1 at the St. Lucie Plant have been evaluated. After applying a 15% derating factor for all the cables in Thermo-Lag enclosed conduits, the worst case ampacity margin is 29% for Unit 1 and 43% for Unit 2. This provides a substantial margin over the circuit's ampacity requirements.

- 2.(c)(2) FPL is aware of the NRC concern regarding the apparent inconsistent ampacity derating results on cable trays. One of the NUMARC tasks under the Thermo-Lag 330-1 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 ensure that the results remain within our design parameters.

#### 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) A testing program is needed to determine the fire rating of the as-installed raceway fire barriers and to determine potential upgrades (as required) to restore the barriers to the original one and three hour fire rating. Additional ampacity derating testing should also be performed to validate the appropriate derating factor for various Thermo-Lag 330-1 installations (to include, as necessary, upgrades from the fire endurance testing). 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 test results found acceptable by the NRC. FPL will respond with a specific

plant action plan after the NRC acceptance of the NUMARC test results.

- (b) Per our response to NRC Bulletin 92-01, Supplement #1, FPL letter L-92-273, dated September 29, 1992, discussed the compensatory measures being implemented by FPL at the St. Lucie Plant. The compensatory measures implemented for the NRCB 92-01 remain in affect in accordance with plant procedures.

Requested Action

4. List all the Thermo-Lag 330-1 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 (AHAC) on Thermo-Lag 330-1. The NRC and NUMARC are working together from a technical and schedular standpoint to resolve the issues related to Thermo-Lag 330-1. As NUMARC provides industry guidance (reviewed by the NRC) for the resolution of the Thermo-Lag 330-1 issues, FPL will formulate an action plan.