

Iowa Electric Light and Power Company

April 5, 1993
NG-93-1143

JOHN F. FRANZ, JR.
VICE PRESIDENT, NUCLEAR

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331

Op. License No: DPR-49

Response to NRC Generic Letter 92-08,
Thermo-Lag 330-1 Fire Barriers

- References: 1) NRC Generic Letter 92-08, Thermo-Lag 330-1 Fire Barriers
2) Letter from J. Franz (IELP) to T. Murley (NRC), Response to NRC Bulletin No. 92-01, Supplement 1, NG-92-4408, dated October 1, 1992
3) Letter from R. Pulsifer (NRC) to L. Liu (IELP), Amendment No. 190 to Facility Operating License No. DPR-49, dated November 23, 1992

File: A-101a, P-72a

Dear Dr. Murley:

This letter provides Iowa Electric Light and Power Company's (IELP's) response to Generic Letter 92-08, Thermo-Lag 330-1 Fire Barriers (Reference 1). Generic Letter 92-08 requests additional information from licensees to verify that Thermo-Lag 330-1 fire barrier systems comply with NRC requirements.

The three principal areas of concern as described in Reference 1 are 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 ratings and the ampacity derating factors of Thermo-Lag 330-1 barriers.

The specific NRC requests and our responses are set out below.

9304120352 930405
PDR ADOCK 05000331
F PDR

Dr. Thomas E. Murley
April 5, 1993
NG-93-1143
Page 2

Item 1)

State whether Thermo-Lag 330-1 barriers are relied upon:

- (a) to meet 10 CFR 50.48, to achieve physical 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.

Response 1a) Thermo-Lag was installed and is relied upon to meet 10 CFR 50.48 requirements for safe shutdown separation. Physical independence of electrical systems is achieved per GDC-17 and the guidance of IEEE 279-71 and does not rely on Thermo-Lag to maintain that independence.

1b) Thermo-Lag is not used to satisfy any specific condition of the plant's operating license. IELP is required per the license to maintain an approved fire protection program as described in the Final Safety Analysis Report for the Duane Arnold Energy Center (DAEC).

1c) Thermo-Lag is used to satisfy licensing commitments other than the requirements of 10 CFR 50.48. Some of the fire barriers which utilize Thermo-Lag to meet 10 CFR 50.48 requirements are also utilized to meet Branch Technical Position (BTP) 9.5-1 requirements.

As stated in the response to NRC Bulletin No. 92-01, Supplement 1 (Reference 2), areas in the plant where Thermo-Lag is used for the above purposes have been identified. Since our response, some additional miscellaneous applications of Thermo-Lag have been identified. These include the use of Thermo-Lag on fire dampers and in penetration seals.

Dr. Thomas E. Murley
April 5, 1993
NG-93-1143
Page 3

Item 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.
- (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.
- (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.

Response 2a) The Thermo-Lag raceway installations at DAEC are based on vendor qualification tests considered acceptable at the time of the installation. Subsequent to the installation at DAEC, questions have arisen regarding the performance of Thermo-Lag fire barrier systems and the validity of vendor tests. Since these issues are currently being reviewed on an industry basis, a detailed backward looking analysis of the Thermo-Lag installations at DAEC using the previous qualification basis is not planned. Instead, qualification of raceway Thermo-Lag installations at DAEC will be based on a new series of tests being pursued by NUMARC. Each installation at DAEC will be reviewed and actions taken to ensure that it is bounded by this test series, has been evaluated in accordance with the guidance of NRC GL 86-10 (Implementation of Fire Protection Requirements) or other NRC guidance, or has been addressed pursuant to 10 CFR 50.12.

The bases for other applications of Thermo-Lag at DAEC (such as fireproofing structural steel and fire dampers and in penetration seals) will be reviewed for adequacy. Any discrepancies identified will be addressed after this review.

Based on the recent information available, the Thermo-Lag installations utilized to satisfy NRC requirements are considered indeterminate.

- 2b) The original raceway installation packages provided appropriate procedural and quality control documentation to assure that the installations at DAEC were in accordance with vendor guidelines at the time of installation. The documentation includes installation details based on vendor guidelines, vendor training of construction personnel, and vendor verification of plant installations. Also, the Thermo-Lag installations were designed and installed to meet the NRC guidance available at the time for fire barrier separation. Recent independent test data indicates that raceway Thermo-Lag barriers installed per the vendor's instructions may not fully meet the required 1- or 3-hour ratings required per Appendix R. The installations do provide some level of protection and, based on combustible loading and other factors, may provide sufficient margin to meet the intent of Appendix R requirements. A detailed analysis comparing the as-installed configurations or any evaluated deviations to the basis considered acceptable at the time of installation is not considered useful. Instead, the raceway installations will be compared to the test configurations utilized in the new testing being pursued by NUMARC.

The installation configurations for other applications of Thermo-Lag at DAEC (such as fireproofing structural steel and fire dampers and in penetration seals) will be reviewed for adequacy. Any discrepancies identified will be addressed as part of this review.

- 2c) The ampacity calculations for raceways protected by Thermo-Lag barriers are based on early vendor supplied test documentation. Reference 1 documents the NRC's concerns relative to the inconsistencies in the available ampacity derating

Dr. Thomas E. Murley
April 5, 1993
NG-93-1143
Page 5

data. It also notes that a national standard ampacity test method for determining the derating factors has not been established. NUMARC is pursuing new testing based on the methodology per IEEE P848 Draft 11 which is being developed to address raceway fire barrier derating test requirements. IELP does not intend to recalculate the ampacity derating at this time. Instead, the original calculations will be revised when this new acceptable data is available from the NUMARC testing program. Based on guidance provided in this generic letter, the ampacity deratings are considered indeterminate. This is a long term cable aging concern and is not an immediate safety concern, thus the NUMARC schedule is acceptable.

Item 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.

Response 3a) Specific corrective actions and a corrective action schedule will be determined after test data is available from the NUMARC industry test program and after NRC guidance on qualification test acceptance criteria is issued in final form.

IELP will work with NUMARC and other utilities to the extent possible to develop an acceptable generic solution to the issues addressed in Generic Letter 92-08. Unique applications of Thermo-Lag at DAEC will be reviewed for adequacy and corrective actions will be taken as applicable.

3b) Reference 2 described the compensatory measures established in response to NRC Bulletin No. 92-01, Supplement 1. Reference 3 revised the Technical Specifications (TS) by removing the requirements for fire protection from the TS and adding administrative controls consistent with the previous requirements.

Dr. Thomas E. Murley
April 5, 1993
NG-93-1143
Page 6

The compensatory measures as described in Reference 2 continue to be in effect. Additional compensatory measures have been established in accordance with the DAEC Fire Plan in plant areas where other miscellaneous applications have been identified.

Item 4)

List all 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.

Response 4) All known applications of Thermo-Lag 330-1 in place to meet NRC requirements are addressed above. In the event that additional miscellaneous applications which fall under the scope of this generic letter are identified, they will be addressed and actions consistent with those already in place will be taken as directed by the DAEC Fire Plan. IELP will continue to review the progress of the NUMARC test program and will notify the NRC if any major deviations from the NUMARC schedule are anticipated.

If you have any questions or require additional information, please contact this office.

Dr. Thomas E. Murley
April 5, 1993
NG-93-1143
Page 7

This letter is true and accurate to the best of my knowledge and belief.

IOWA ELECTRIC LIGHT AND POWER COMPANY

By John F. Franz
John F. Franz
Vice President, Nuclear

State of Iowa
(County) of Linn

Signed and sworn to before me on this 5TH day of APRIL,
1993, by CYNTHIA L. HILZENDAGER.

Cynthia L. Hilzendager
Notary Public in and for the State of Iowa

MARCH 29, 1996
Commission Expires

JFF/TWP/pjv~

cc: T. Page
L. Liu
L. Root
R. Pulsifer (NRC-NRR)
A. Bert Davis (Region III)
NRC Resident Office
DCRC