

PHILADELPHIA ELECTRIC COMPANY

GL 92-08
10 CFR 50.54(f)

NUCLEAR GROUP HEADQUARTERS
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WAYNE, PA 19087-5691

(215) 640-6000

April 16, 1993

STATION SUPPORT DEPARTMENT

Docket Nos. 50-277
50-278
50-352
50-353
License Nos. DPR-44
DPR-56
NPF-39
NPF-85

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

SUBJECT: Peach Bottom Atomic Power Station, Units 2 and 3
Limerick Generating Station, Units 1 and 2
Response to NRC Generic Letter 92-08
"Thermo-Lag 330-1 Fire Barriers"

Dear Sirs:

The subject Generic Letter (GL) 92-08 dated December 17, 1992, was issued to obtain additional information from licensees to verify that Thermo-Lag 330-1 fire barrier systems comply with NRC requirements. The NRC requested licensees respond within 120 days from the date of the GL. Each of the reporting requirements is restated below, followed by Philadelphia Electric Company's (PECo's) response for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, and Limerick Generating Station (LGS), Units 1 and 2. As permitted by GL 92-08, where the information requested has been previously submitted in either our July 24, 1992 response to NRC Bulletin No. 92-01, "Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free from Fire Damage," dated June 24, 1992, or our September 28, 1992 response to Bulletin No. 92-01, Supplement 1, "Failure of Thermo-Lag 330 Fire Barrier System to Perform its Specified Fire Endurance Function," dated August 28, 1992, for PBAPS, Units 2 and 3, and LGS, Units 1 and 2, we reference those submittals.

This letter is being submitted in accordance with 10CFR50.54(f), and the required affirmation is enclosed.

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Reporting Requirement 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

a) PBAPS must comply with the requirements of 10CFR50.48 and 10CFR50, Appendix R. The description of our compliance with these requirements is provided in the PBAPS "Fire Protection Program" of the Updated Final Safety Analysis Report (UFSAR). LGS must comply with requirements of 10CFR50.48 only. Our compliance with 10CFR50.48 is through our commitment to NRC Branch Technical Position (BTP) CMEB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," dated July 1981, as described in Appendix 9A, "Fire Protection Evaluation Report," of the LGS UFSAR. ~~Thermo-Lag 330-1 fire barrier material was installed to implement the provisions of the fire protection programs at PBAPS and LGS as described above.~~ For both PBAPS and LGS, Thermo-Lag 330-1 fire barrier material was not used to achieve physical independence of electrical systems in accordance with Regulatory Guide 1.75, "Physical Independence of Electrical Systems."

b) The Facility Operating Licenses for PBAPS, Units 2 and 3, contain a License Condition concerning modifications that were required to implement the fire protection program; however, Thermo-Lag 330-1 was not used to meet these License Conditions. The fire protection program at LGS is governed by License Condition 2.C.(3) of the Facility Operating Licenses for LGS, Units 1 and 2, respectively. ~~The Thermo-Lag 330-1 fire barrier material that was installed to implement the provisions of the fire protection program at LGS meets these License Conditions as well.~~

c) The use of Thermo-Lag 330-1 fire barrier material to satisfy licensing commitments is discussed in the response to Item (a) above.

Reporting Requirement 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 to 2(a)

PECo did not perform any plant specific fire endurance tests of Thermo-Lag 330-1 material to qualify the fire barriers at PBAPS or LGS but relied on fire endurance tests performed by the Thermo-Lag 330-1 manufacturer, i.e., Thermal Science Incorporated (TSI), and other utilities to qualify the PECO installations. The TSI fire endurance tests were independently reviewed and approved by Industrial Testing Laboratories (ITL) and American Nuclear Insurers (ANI); therefore, PECO's understanding at the time was that the material was properly tested and qualified.

Response to 2(b)

- (1) The tests PECO relied on to qualify fire barriers included tests of various configurations. Some of the test configurations are comparable to PECO installed configurations; however, ~~at both PBAPS and LGS, some Thermo-Lag 330-1 assemblies were developed to provide a fire barrier for a unique physical arrangement.~~ These unique fire barrier assemblies were not specifically covered by the TSI test configurations but rather were assembled based on an interpretation of the general TSI installation procedures.
- (2) At PBAPS, Thermo-Lag was installed in accordance with the PECO modification process and the PBAPS Fire Protection Quality Assurance (QA) program. The personnel who installed the Thermo-Lag were trained by TSI on proper installation techniques. A prototype design and critical generic design parameters (i.e., band separation, thickness) were approved for use by TSI. Subsequent enhancements to this design, including the application of stress-skin on the Thermo-Lag assembly butt joints, were also approved by TSI.

At PBAPS, all material was receipt inspected in accordance with the Fire Protection QA program for proper dimensions (e.g., thickness) and a complete review of the installed Thermo-Lag assemblies and the design drawings was performed to assure that the installed assemblies conformed to the approved design.

At LGS, the installation of Thermo-Lag was controlled by the Architect-Engineer, (A/E). The design of the fire barriers was developed using a set of installation procedures from TSI. In the field, some deviations from the TSI standard design (e.g., because of interference with structural supports) were approved by an onsite TSI representative; however, documentation is not available for all of these deviations. The material for Thermo-Lag assemblies was either purchased from TSI or manufactured on-site in accordance with TSI's instructions. The material was either receipt inspected or quality controlled by the A/E before it was installed at LGS, and the final installation was inspected in accordance with the QA Program Description for LGS, Units 1 and 2, Design and Construction Phase.

Response to 2(c)

- (1) Ampacity derating factors based on TSI documentation were used in the original analyses for both PBAPS and LGS. The cables servicing engineered safety features were thermally sized and derated in accordance with methods outlined in Insulated Power Cable Engineers Association (IPCEA), "Power Cable Ampacities Volume I and Volume II," and the National Fire Protection Association (NFPA) - Code 70, "National Electric Code." The installed fire barrier configuration was not considered in determining the ampacity derating.
- (2) The calculations PECO used to determine the ampacity derate are in accordance with recognized methods; however, the factors used in the method to account for the derating for encapsulating cables in Thermo-Lag 330-1 are now known to be suspect. ~~At both PBAPS and LGS, sufficient margins are currently available between load and derated ampacity for all encapsulated cables based on the most conservative published derating factors, and engineering judgment.~~ As a result, the ampacity derating factors previously used are considered acceptable for the installed fire barriers.

Reporting Requirement 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 to 3(a)

PECo is a participant in the industry Thermo-Lag testing program under development by the Nuclear Management and Resources Council (NUMARC). This program is intended to provide generic test results and information necessary to accomplish permanent corrective actions. NUMARC's expected schedule for the testing program activities is described below.

1. A generic test matrix is being developed to analyze the first series (i.e., Phase 1) of installed configurations. The evaluation of the generic test matrix is expected to be complete by the end of April 1993. The test matrix and summary results of the installed configuration survey will be distributed in May 1993. This will provide information on the scope of configurations to be tested in Phase 1 of the generic testing program. The need for follow-on testing phases, and the extent to which utilities may need to consider specific actions to address their unique configurations, may not be covered under the generic program. PECO will address these situations on a case-by-case basis.
2. Specific ampacity derate testing of upgraded one hour conduit and cable tray installations at Texas Utilities (TU) was completed in March 1993. NUMARC is currently evaluating the generic applicability of the specific TU tests and this evaluation will be completed by June, 1993. The industry Thermo-Lag testing program under development may involve application of additional fire barrier material to installed configurations. The additional material may require further ampacity derating tests or analytical methods to determine or extrapolate the results of baseline ampacity testing. The NUMARC program will include the development of such information.
3. Fire endurance testing of upgrades of one and three hour rated common raceway configurations (i.e., conduits and cable trays) is scheduled for June 1993.
4. Fire endurance testing of additional configurations identified in the test matrix will be completed by September 1993. Further ampacity derating tests for these configurations will be performed as appropriate.
5. Test reports and installation guidance for the upgraded configurations will be made available approximately two months after performance of successful fire endurance tests based on the new acceptance criteria currently being developed. This information will be available from NUMARC either in hard copy form or through a computer database. Information will also be available relative to the results of various utility specific tests that have been or will be performed in the same time frame.

6. Once test results applicable to a specific configuration are available, effective permanent corrective actions will be determined. We expect that all results from Phase 1 of the industry test program will be available by the end of 1993. PECO will submit a report detailing the status of our Thermo-Lag corrective action program at that time.

PECO is evaluating all corrective action options; however, until approved fire endurance testing and cable ampacity derate testing acceptance criteria are developed, and the results of NUMARC's testing programs are available, we will not have all of the necessary information to select final corrective actions.

Response to 3(b)

This information was provided in our response to NRC Bulletin No. 92-01, Supplement 1, dated September 28, 1992.

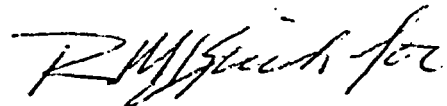
Reporting Requirement 4

List all Thermo-Lag 330-1 fire 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 to 4

All of the Thermo-Lag 330-1 fire barriers installed to comply with the purposes stated in Response 1 at either PBAPS or LGS are currently considered inoperable. The corrective actions schedule provided in response to Reporting Requirement 3 applies to all of these barriers.

Very truly yours,



G. A. Hunger, Jr., Director
Licensing Section

Enclosure: Affirmation

cc: T. T. Martin, Administrator, Region I, USNRC
J. J. Lyash, USNRC Senior Resident Inspector, PBAPS
N. S. Perry, USNRC Senior Resident Inspector, LGS

COMMONWEALTH OF PENNSYLVANIA:

: SS.

COUNTY OF CHESTER

:

G. R. Rainey, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company; the Applicant herein; that he has read the attached Response to Generic Letter 92-08 for Peach Bottom Atomic Power Station Facility Operating Licenses DPR-44 and DPR-56 and Limerick Generating Station Facility Operating Licenses NPF-39 and NPF-85 knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.

G. R. Rainey
Vice President

Subscribed and sworn to
before me this *16th* day
of *April* 1993.

Erica A. Santori
Notary Public

Notarial Seal
Erica A. Santori, Notary Public
Tredyffrin Twp., Chester County
My Commission Expires July 10, 1995