

The Light company


Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

April 16, 1993
ST-HL-AE-4389
File No.: G03.8
10CFR50 App. A.3

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

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Response to NRC Generic Letter 92-08,
"Thermo-Lag 330-1 Fire Barriers"

Attached is the Houston Lighting & Power (HL&P) response to Generic Letter 92-08. If there are any questions, please contact Mr. A. W. Harrison at (512) 972-7298 or me at (512) 972-7921.


S. L. Rosen
Vice President,
Nuclear Engineering

JTC/pa

Attachment: STP Response to Generic Letter 92-08

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Project Manager on Behalf of the Participants in the South Texas Project

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Houston Lighting & Power Company
South Texas Project Electric Generating Station

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter)

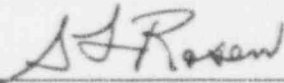
Houston Lighting & Power)
Company, et al.,)

Docket Nos. 50-498
50-499

South Texas Project)
Units 1 and 2)

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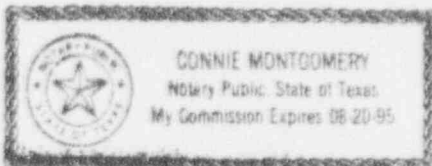
S. L. Rosen being duly sworn, hereby deposes and says that he is Vice President, Nuclear Engineering, of Houston Lighting & Power Company; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached proposed changes to the South Texas Project Electric Generating Station Technical Specification Surveillance 4.4.6.2.2d; is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge and belief.

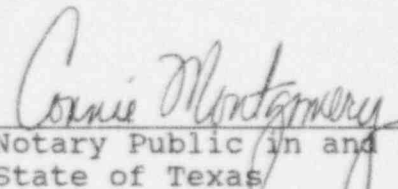


S.L. Rosen
Vice President,
Nuclear Engineering

STATE OF TEXAS)
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Subscribed and sworn to before me, a Notary Public in and
for The State of Texas this day of , 1993.





Notary Public in and for the
State of Texas

STP RESPONSE TO GENERIC LETTER 92-08

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.

STP Response

1. Thermo-Lag 330-1 fire barrier systems are used at STP to provide both one-hour and three-hour fire barrier separation of safe shutdown equipment outside containment and to provide separation as a radiant energy shield inside containment to meet HL&P's fire protection program as specified in 2.E. of each of the operating licenses for STP. Thermo-Lag 330-1 is also used to achieve physical independence of electrical systems per NRC guidance provided in Regulatory Guide (RG) 1.75.

HL&P maintains controlled raceway wrap schedules which identify the raceways protected by Thermo-Lag 330-1. These schedules distinguish between Thermo-Lag applied to meet safe shutdown requirements and Thermo-Lag required to meet RG 1.75 requirements. HL&P also maintains the analyses which support the bases of the wrap locations.

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 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.

STP Response

- 2.(a) HL&P has relied upon fire endurance tests supplied by the Thermo-Lag vendor, Thermal Sciences, Inc. (TSI), to qualify the Thermo-Lag 330-1 installation at STP. These tests were conducted by Industrial Testing Laboratories, Inc. (ITL). Prior to the recent concern about Thermo-Lag, HL&P considered these tests to be valid based on NRC acceptance of the STP Fire Protection Program and documented American Nuclear Insurers (ANI) approval of specific test results accompanying TSI Thermo-Lag installation procedures.

Recently, in their report issued under cover with Information Notice 92-46 and in Bulletin 92-01, the NRC has identified generic and specific concerns regarding ITL fire endurance tests. Therefore, the results of the fire endurance tests used to qualify Thermo-Lag 330-1 at STP are considered to be indeterminate. Consequently, while it is clear that the Thermo-Lag has fire endurance capability as installed at STP, the actual fire ratings of barriers are considered to be indeterminate. It is impossible at this time to state that previously qualified barriers will remain qualified without upgrades in accordance with new guidance that is still under development and with a new test program (see corrective actions under Item 3 below) that is yet to be established. Consequently, the Thermo-Lag is being treated as inoperable and compensatory measures have been established as described under item 3 below.

- 2.(b)(1) HL&P has performed a review of associated documentation and has found that there is substantial evidence indicating that Thermo-Lag has been installed at STP in accordance with vendor requirements. TSI installation procedures were used directly for the installation of Thermo-Lag fire barriers at STP. The installing contractor, Transco Products, Inc. (TPI), was a certified installer of Thermo-Lag. TPI maintained a quality assurance and quality control program which governed the Thermo-Lag installation at STP. Part of the TPI quality control program required in-process inspections of the barriers which confirmed barrier thicknesses, cleanliness of the protected envelope, and minimum spacing of 1/2 inch between protected cables and the Thermo-Lag material. Final inspections verified that the permanent identification markers were installed in accordance with approved procedures, that maximum band/wire spacing was 12 inches, that all joints and cracks were sealed in accordance with installation procedures, and that each installation conforms to its assigned detail. These inspection reports are maintained as quality records.

Our review has revealed that some of the as-built configurations are not bounded dimensionally by those in the fire tests. Corrective actions described under Item 3 are planned to address this issue.

- 2.(b)(2) HL&P reviewed the Thermo-Lag installation program which revealed that the program included a mechanism to document and disposition deviations from installation procedures. However, some of the deviations are not dispositioned consistently with NRC guidance provided in GL 86-10. Corrective actions for this issue are addressed under Item 3 below.
- 2.(c)(1) HL&P sponsored STP site-specific ampacity derating tests which were conducted by Underwriters Laboratories (UL). Prior to the testing, HL&P prepared an ampacity derating test specification which specified test assemblies to be built using cables, cable fill, and cable tray and conduit types consistent with those installed in the plant. With minor exceptions which were pre-approved by the HL&P engineering staff and which did not impact test results, the UL tests were conducted in accordance with the test specification. Thermo-Lag barriers for the tests were selected and assembled in a manner consistent with configurations installed in the plant. All test enclosures were constructed by personnel employed to construct fire barriers at STP. Most of the materials used to construct the test assemblies were retrieved from STP stock. As a result, HL&P considers the as-built Thermo-Lag 330-1

barrier configurations to be consistent with those used during the ampacity derating tests which HL&P relies upon for derating factors used at STP.

- 2.(c)(2) Because HL&P conducted ampacity derating tests specifically for STP as described above, we consider the test results to be applicable to the plant design. The derating factors resulting from these tests were used directly in the analyses which verify the acceptability of all Thermo-Lag wrapped power cable sizing in accordance with industry standards.

Regarding the correctness of these tests, no standard currently exists with which to compare testing methods. In GL 92-08, the NRC expressed concern about the stabilization period used after the final current adjustment was made during the UL tests. Specifically, GL 92-08 states that:

"The NRC learned that UL performed duplicate tray baseline tests using a longer stabilization period (4 hours instead of 15 minutes) after the final current adjustment and obtained a higher baseline current, which yielded higher derating factors (36.1 percent for 1-hour barriers and 38.9 percent for 3-hour barriers)."

The original UL test report for STP makes the following statement regarding the stabilization period:

"For each ampacity test, approximately 15 min time was allowed to elapse after the final electrical current adjustments were made to ensure that the cable conductor temperatures were stabilized. Upon reaching and maintaining the steady-state temperature of 90 degrees C +/-0.4 degrees C over the 15 min time period, the electrical current was recorded and the temperatures of each thermocouple in the test set up were measured and recorded at 1 min intervals for a 60 min time period. During the 60 min time period, the electrical current was monitored to ensure that it did not change."

The purpose of the stabilization period is to ensure that no current adjustments are required to maintain the conductor temperature constant during the interval in which current is being measured. To that end, the 15 minute stabilization period in the HL&P sponsored tests proved to be adequate since during the subsequent 60 minute interval during which current was measured no adjustments were required to maintain the 90 degrees C conductor temperature. It should also be noted that ampacities

resulting from the baseline tests conducted during the UL tests are consistent with published values in ICEA P-54-440 and the National Electric Code for unwrapped cable tray and conduit configurations, respectively, thereby serving to further validate the testing procedure.

In summary, the UL ampacity derating tests HL&P relies upon for the sizing of electrical cables enclosed in Thermo-Lag fire-rated barriers are considered acceptable and applicable to current STP plant design.

For many installed configurations, upgrades may be required through the NUMARC Thermo-Lag generic testing program (see response to Item 3 below). These upgrades may involve the application of additional fire barrier material to installed configurations, and as such, would require the use of NUMARC ampacity test results, further ampacity derating tests, or analyses to extrapolate the results of ampacity testing on baseline and upgraded configurations. HL&P will evaluate the results of both the NUMARC fire endurance and ampacity tests for applicability as the results become available.

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.

STP Response

- 3.(a) As part of the corrective actions in response to GL 92-08, HL&P has already committed to supporting the forthcoming NUMARC Thermo-Lag generic testing program. This commitment is demonstrated in HL&P's proactive approach in responding to the NUMARC Thermo-Lag Information Request in November 1992. The NUMARC Thermo-Lag generic testing program is intended to provide generic testing and information necessary to accomplish corrective actions. The following program elements are anticipated:
 1. Evaluation of phase 1 generic test matrix resulting from the survey information. This will provide information on the scope of configurations to be tested in phase 1 of the generic program, the need for follow-on generic testing phases, and the extent to which HL&P may need to consider

specific actions to address unique configurations at STP that may not be covered under the generic program.

2. Ampacity testing of upgraded one-hour rated conduit and cable tray installations.
3. Fire endurance testing of upgrades for one-hour and three-hour rated common raceway configurations.
4. Fire endurance testing of additional configurations identified in the test matrix, as needed. Ampacity derating tests for these configurations will follow, as appropriate.
5. Review and identification of Thermo-Lag plant upgrades or consideration of alternate materials to upgrade as-built configurations to match qualified test configurations.
6. Availability of test reports and installation guidance will follow each phase of testing.

Because test and acceptance criteria have not yet been finalized with the NRC, a schedule of these activities has not yet been determined. NUMARC has committed to providing the NRC with specific program dates as they become available.

HL&P will evaluate existing Thermo-Lag installation procedures and configurations against NUMARC results and will provide dispositions of existing configurations, as appropriate. In addition, HL&P will evaluate existing deviation reports against NUMARC results to establish acceptable methods for evaluating new and existing deviations from tested configurations, using guidance provided in GL 86-10. The schedule for these activities is closely linked with NUMARC's Thermo-Lag generic testing program; however, HL&P anticipates the initiation of these activities in late 1993 or early 1994.

- 3.(b) Compensatory measures established in response to NRC Bulletin 92-01 and associated Supplement 1, and currently in effect at STP are considered adequate for the conditions identified in response to Items 2(a), 2(b)(1) and 2(b)(2) above. For areas outside the reactor containment building (RCB), these measures include posting fire watches for each of the fire areas with Thermo-Lag protecting primary safe shutdown circuits such that at least one continuous safe-shutdown path is included in the watch. For areas inside the RCB, these measures include staging fire suppression equipment close to containment entry air locks, establishing prestaged radiation work permits to

ensure prompt RCB entry by the fire brigade in case of fire, briefing the fire brigade on the degraded condition of Thermo-Lag, and drilling the fire brigade on RCB entry.

Because the basis of the Bulletin 92-01 fire watch is the degraded condition of all Thermo-Lag barriers that protect and separate components providing safe shutdown capability, it is commensurate with actions required as a result of the negative response to Item 2(a) above regarding the acceptability of fire endurance tests at STP. The negative responses to both items under 2(b) above require no additional compensatory measures since the conclusions are the same, specifically that the fire endurance ratings of all Thermo-Lag installed at STP are indeterminate, whether due to invalid fire tests or due to improper application and bounding of tests to installed configurations. As such, no additional compensatory measures beyond those established in response to Bulletin 92-01 are imposed in response to GL 92-08.

RG 1.75 concerns addressed by the NRC in GL 92-08 require no compensatory measures because (1) Thermo-Lag used as a RG 1.75 barrier is not required to maintain any fire rating, (2) Thermo-Lag configurations used in STP ampacity derating tests are consistent with as-built configurations and with plant design, and (3) the concerns apply to a cable aging issue, to which no imminent shutdown risk or danger to the health or safety of the public currently exists.

Reporting Requirement

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.

STP Response

4. The above responses were prepared based on a programmatic review of all Thermo-Lag barriers installed at STP. As a result, no outstanding responses exist to Item 2 above and no further response is required beyond the confirmation of completion of corrective actions established under Item 3.