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October 26, 1995

U.S. Nuclear Regulatory Commission
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Subject: Supplement to Response to Follow-Up to the Request for Additional Information Regarding Generic Letter 92-08 Issued Pursuant to 10 CFR 50.54(f) on December 28, 1994 (TAC No. M85596)
River Bend Station - Unit 1
License No. NPF-47
Docket No. 50-458

File Nos.: G9.5, G9.33.4

RBG-42029
RBF1-95-0241

Gentlemen:

The Follow-up to the Request for Additional Information Regarding Generic Letter (GL) 92-08 Issued Pursuant to 10 CFR 50.54(f) on December 28, 1994 requested, in part, that Entergy Operations, Inc., (EOI):

> Submit the schedule for obtaining and verifying all of the important barrier parameters. After the information has been obtained and verified, submit a written supplemental report that confirms that this effort has been completed and provides the results of the examinations and inspections. Verify that the parameters of the in-plant configurations are representative of the parameters of the fire endurance test specimens. Describe any changes to previously submitted plans or schedules that result from the examinations.

EOI's response dated March 28, 1995 (RBG-41346), explained that the destructive examination walkdowns were completed and the results of the destructive examinations were being reviewed and verified at that time. The review and verification have since been completed. Attached is a summary of the results of the destructive examinations and inspections.

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P PDR

As explained previously, River Bend Station (RBS) is pursuing a comprehensive program to evaluate applications of Thermo-Lag in the plant. The project consists of two sections. The first is a re-analysis of the Safe Shutdown Methodology. This effort is expected to result in a significant reduction in the amount of fire wrap material required. The second portion of the project will address Thermo-Lag directly. This portion will review the Thermo-Lag installations that remain and determine if the Thermo-Lag can be qualified as-is through additional testing, if the Thermo-Lag can be upgraded economically using methods similar to those tested by the Nuclear Energy Institute, or if the Thermo-Lag must be replaced with a different material. Verification that the parameters of the in-plant configurations are representative of the parameters of the fire endurance test specimens will be included as part of the development of the required test configurations.

Resolution of Thermo-Lag issues and completion of corrective actions is scheduled to be completed by the end of refueling outage 7, currently scheduled to begin in September 1997. The destructive examinations did not result in any changes to this schedule.

Should you have any questions or require additional information, please contact Mr. David N. Lorfing of my staff at (504) 381-4157.

Sincerely,

James J. Fisicaro

JJF/kvm
attachment

cc: U.S. Nuclear Regulatory Commission
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BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-47

DOCKET NO. 50-458

IN THE MATTER OF

GULF STATES UTILITIES COMPANY

CAJUN ELECTRIC POWER COOPERATIVE AND

ENTERGY OPERATIONS, INC.

AFFIRMATION

I, James J. Fisicaro, state that I am Director of Nuclear Safety of Entergy Operations, Inc., at River Bend Station; that on behalf of Entergy Operations, Inc., I am authorized by Entergy Operations, Inc. to sign and file with the Nuclear Regulatory Commission, this Supplement to Response to Follow-up to the Request for Additional Information Regarding Generic Letter 92-08 Issued Pursuant to 10 CFR 50.54(f) on December 28, 1994 (TAC No. M85596), that I signed this supplement as Director-Nuclear Safety at River Bend Station of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information, and belief.

James J. Fisicaro

STATE OF LOUISIANA
WEST FELICIANA PARISH

SUBSCRIBED AND SWORN TO before me, Notary Public, commissioned in the Parish of East Baton Rouge and qualified in and for the Parish and State above named, this 26th day of October, 1995.

(SEAL)

Jane Russell
Notary Public

My Commission expires with life.

ATTACHMENT

DESTRUCTIVE EXAMINATION

SAMPLING PLAN AND

SUMMARY OF RESULTS

ENTERGY OPERATIONS, INC.
RIVER BEND STATION

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1.0 PURPOSE

The purpose of this plan is to provide a methodology which identifies the internal (hidden) parameters for the as-installed Thermo-Lag installations at RBS based on a sampling of these configurations. This plan selects the configurations to be examined, establishes the basis for the sampling being representative of the installed configurations and then documents the result of these examinations.

2.0 PLAN

The original plan indicated that 33 configurations would be destructively examined and 5 opened for visual inspection. After these items were examined it was determined that one (1) additional item, a Thermo-Lag ceiling assembly, was also accessible for examination and three (3) of the configurations revealed additional information about other types of coverage (e.g., destruction of a box panel revealed airdrop coverage). This brings the total number to 42 configurations examined. This is based on a review of the as-installed Thermo-Lag configurations using Drawings EE-34YA through EE-34YH and the design specification for the installation of Thermo-Lag (Reference 3.5).

Enclosures were chosen utilizing the following criteria:

1. A minimum of 1 configuration selected from each main fire area/zone in the plant where Thermo-Lag was installed.

2. The sampling will include both 1 hour and 3 hour enclosures.

3. The sampling will be representative of the various types of coverage found at RBS such as coverage on pull and terminal boxes, conduits, and cable trays. To establish consistency of construction techniques, two (2) samples minimum of each type of barrier configuration selected will be examined.

4. Wherever possible Thermo-Lag configurations which are no longer required and are abandoned in place will be utilized in order to minimize the impact of this examination.

The main attributes to be verified by this examination are as follows:

1. Materials

   a. Panels with or without ribs
   b. Thickness of material
   c. Stress skin on the interior

2. Joining techniques

   a. Prebuttered or post buttered joints (including sufficient quantities of trowel grade (mastic) to compensate for shrinkage)
   b. Butt, mitered or score and fold joints
   c. Joint orientation (side piece in compression, etc.)

3. Interior support for the enclosure

   a. Panels secured against the protected commodity (pull boxes, conduits etc.)

   b. Interior support mechanisms independent of the protected commodity (e.g., Unistrut, angle iron, tube steel, banding, etc.)

   c. Extent of and size of unsupported panel sections

4. Condition of installed enclosure

   a. Continuity of the interior stress skin

   b. Proper utilization of joining techniques

   c. Damaged Thermo-Lag material

5. Other

   a. Continuity of coverage on adjacent structural steel or nonessential raceways per the 9" (1 hour) and 18" (3 hour) rules

Once the destructive examination was complete, at least one additional configuration for each type and rating of coverage was examined externally (non destructive) in detail utilizing the results of the destructive examinations in order to further validate the consistency of installation.

3.0 BASIS

The 42 samples selected are representative of the Thermo-Lag installations at RBS based on the following:

1. At least 1 configuration at each main fire area/zone where Thermo-Lag is installed and at least two samples of each type of configuration were examined. Since it is not known which crew of installers worked in which locations, this will provide a representative sampling of the installation practices used throughout the plant.

2. Of the 42 samples selected, 27 are 1 hour configurations and 15 are 3 hour configurations broken down as follows:

   1 Hour
   a. 6 straight conduit runs
   b. 2 conduit radial bends
   c. 2 cable air drops
   d. 9 junction box/pull box/condulet/LBD's
   e. 2 unistrut supported box enclosures - (1) MOV enclosure, (1) Instrument rack
   f. 3 cable trays
   g. 3 multi-tray enclosures - unistrut supported

   3 Hour
   a. 3 straight conduit runs
   b. 3 conduit radial bends
   c. 1 cable air drop
   d. 2 junction box/pull box/LBD/condulet
   e. 2 unistrut supported box enclosures
   f. 2 cable trays
   g. 1 multi-tray enclosure - unistrut supported, covered with Thermo-Lag panels
   h. 1 flow switch covered with preshaped conduit sections

3. 20 samples were selected for nondestructive external examination. 9 were 1 hour configurations and 11 were 3 hour configurations broken down as follows:

1 Hour

a. 1 straight conduit runs and supports
b. 2 conduit radial bends
c. 1 cable air drops
d. 2 junction box/pull box/condulet/LBD
e. 1 cable tray
f. 1 multi-tray enclosures - unistrut supported
g. 1 floor/ceiling assembly

3 Hour

a. 3 straight conduit runs
b. 3 conduit radial bends
c. 1 cable air drop
d. 1 box enclosure
e. 1 cable tray
f. 1 multi-tray enclosure - unistrut supported
g. 1 floor penetration

This distribution of barrier configurations represents a reasonable cross section of the various types of configurations installed. The samples selected coupled with the subsequent external examinations and the design specification therefore provides a high level of confidence in the consistency of installation techniques for the type of coverage.

Part of the sampling effort (19 of 45 samples) concentrated on the unique configurations where external inspection alone does not provide an adequate verification of barrier parameters due to multiple items being covered and relatively large boxed enclosures around the items. The sampling of box enclosures represents approximately 42% of these types of enclosures which is sufficiently representative. The results of the destructive examinations, the subsequent detailed external examinations, and the design specification should provide a high level of confidence in the overall consistency of installation techniques used to construct the box enclosures.

4.0 SUMMARY OF DESTRUCTIVE AND NONDESTRUCTIVE EXAMINATIONS

The following is a summary of the findings from the destructive and nondestructive examinations.

A. Materials

1. Panels used for both 1 and 3 hour enclosures had V-ribs. The 1 hour panels and preshaped half rounds had stress skin on the inside and the 3 hour panels and preshaped half rounds had stress skin on the inside and outside.

2. It was common to find at least some missing stress skin on both panels and half rounds and some missing V-ribs on panels. The missing stress skin and V-ribs was more prevalent on the cut pieces and on larger pieces where they mated at corners or covered trays and a tight fit was desired. There were however several cases where large amounts of stress skin/v-ribs were removed but these were more the exception than the rule.

3. Panel and V-rib thicknesses were good with some 3 hour material being used on 1 hour applications.

B. Joining Techniques

1. Most of the joints were post-buttered but pre-buttered joints were commonly found. The joints were mostly butted together but there were several locations where mitered joints were used on boxed enclosures.

2. Radial bends on conduit coverage were generally mitered, but there was some bending of half rounds to minimize the amount of mitered joints. This was much more common on half round coverage on flex-conduits, air drops and conduit bends less than 90°. There were several cases where gaps between mitered half round segments were 1" to as much as 3". These gaps were filled with trowel grade to the required thickness.

3. Where larger half rounds were used to cover LBD's or conduit supports there was generally a good overlap of smaller conduit coverage sections but there were occasions where gaps occurred due to the different shapes of the pieces and the gaps would be filled with trowel grade but would be less than the required thickness.

4. Joint orientation in the panel enclosures varies. Sometimes side panels were in compression and sometimes they were not.

5. There were several situations where additional stress skin and trowel grade were installed over the outside of both panels and half rounds but this generally only involved part of the joints at any one location.

6. Generally the gaps at joints were kept to a minimum but there were cases, especially where small pieces were fitted around conduits, etc., where excessive gaps were created (greater than 1/2") and the gaps were not always filled with trowel grade to the required thickness.

C. Interior support for the enclosure

1. Generally panels over junction boxes, LBD's, condulets and cable trays were tight to the protected commodity and half rounds on conduits were tight to the conduit. There were situations on conduits and flex-conduits where there was a gap of 1/2" or more between the coverage and the item. This was more prevalent on bends but also occurred on some straight segments.

2. Larger enclosures around MOV's, instrument racks and multiple trays had Thermo-Lag installed against and bolted to unistrut frames which were independent of the protected commodity. These structures generally provided good interior support for these enclosures but there were several cases where panels had bowed or sagged creating a mismatch at joints.

D. Condition of installed enclosure

1. The continuity of interior stress skin and V-ribs varied due to the numerous situations where stress skin and V-ribs were missing.

2. The use of pre-buttered versus post-buttered varied between enclosures and there were instances where both joining methods were used on the same enclosure. Joint gap tolerances were good overall with only a few enclosures where joint gaps were excessive.

3. The quality of the Thermo-Lag materials was generally good with no evidence of voids or gaps in the panels or half rounds but there were several cases where the panels had been damaged either by being stepped on or from sagging.

E. Structural Interfaces

1. Structural interfaces varied where raceways went through blockouts filled with penetration seal material. The coverage either continued through the penetration seal or flared out and was bolted to the structure. Where covered cables ran along the structure or went through sleeves that were grouted into the structure, the coverage was generally butted to structure with trowel grade applied at the interface.

F. Coverage on supports and intervening steel

Primary support steel carrying the load of the protected item was completely covered to the structure. Secondary support steel and intervening steel were covered a minimum of 18" from the protected item.

G. Fasteners

Tie-wires were predominantly utilized but both bands and tie wires were used as fasteners. Hilti type bolts were used to anchor the Thermo-Lag to concrete floors and walls where the Thermo-Lag was flared out at the wall or floor interface. Fastener spacing was consistently maintained at 12 inches or less but there was no requirement for installing fasteners within 2" of joints so there is a generic problem where bands/wires are greater than 2" from joints.

5.0 REFERENCES

5.1 Criterion 240.201A, "10 CFR 50, Appendix R Safe Shutdown Analysis", Rev. 1

5.2 Appendix R Raceway Fire Protection Details drawings.

3.2.1 EE-34 YA, Rev. 3
3.2.2 EE-34 YB, Rev. 3
3.2.3 EE-34 YC, Rev. 4
3.2.4 EE-34 YD, Rev. 3
3.2.5 EE-34 YE, Rev. 1
3.2.6 EE-34 YH, Rev. 0

5.3 USAR 9.5.1 Fire Protection Systems and Associated Figures, Rev. 6

5.4 SSER 9.5, May 1984 including Supplement 2, August 1985 and Supplement 3, August 1985.

5.5 File No. 3228.410-982-0004A, TSI 20684, Thermo-Lag 330 Fire Barrier System Installation Manual, Rev. V

5.6 File No. 3228-41-095-003A, "Installation Procedures for "Appendix R" Fire Barrier Materials and Establishment of One and Three Hour Rated Fire Protection Envelopes", Rev. 0

5.7 Specification 228.410, Furnishing and Installation of Thermal Insulation Outside of the Drywell, Rev. 2

5.8 VECTRA Engineering Report No. 0103-00112-TR-01, Rev. 1, "Report on Thermo-Lag 330-1 Installed at River Bend Station"