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River Bend Station  
PO Box 220  
St. Francisville, LA 70775

April 19, 1994

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

SUBJECT: River Bend Station - Unit 1  
Docket No. 50-458  
License No. NPF-47  
Licensee Event Report 50-458/90-003

File Nos. G9.5, G9.25.1.3

RBG-40492

Gentlemen:

In accordance with 10CFR50.73, enclosed is a supplement to Licensee Event Report 90-003. This supplement is submitted to provide a status of the actions related to Thermo-Lag at River Bend Station.

Very truly yours,

James. J. Fisicaro  
Director - Nuclear Safety

Enclosure

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cc: U.S. Nuclear Regulatory Commission  
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ATTN: Administrator

## LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/\_haracters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-G104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	RIVER BEND STATION	BUCKET NUMBER (2)	PAGE (3)
		05000458	1 OF 5

TITLE (4) Inadequate Thermo-Lag Fire Barrier Envelopes Surrounding Safe Shutdown Circuits Per TS 3/4.7.7

EVENT DATE (5)			SER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)			
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER		
02	06	90	90	-- 003 --	05	04	19	94	FACILITY NAME	DOCKET NUMBER 05000		
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10)		100	20.402(b)			20.405(c)			50.73(a)(2)(iv)		73.71(b)	
			20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)		73.71(c)	
			20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(vii)		OTHER	
			20.405(a)(1)(iii)			X	50.73(a)(2)(i)			50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
			20.405(a)(1)(iv)				50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)		
			20.405(a)(1)(v)				50.73(a)(2)(iii)			50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
DAVID N. LORFING, SUPERVISOR - NUCLEAR LICENSING	(504) 381-4157

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)			
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During the performance of Surveillance Test Procedure STP-000-3602 on 02/06/90 through 02/08/90 with the unit in Operational Condition 1 (full power), it was found that several minor deficiencies existed in the Thermo-Lag fire barrier envelopes around redundant safe shutdown circuits. These deficiencies consisted of small holes, cracks and unfilled seams in the Thermo-Lag material. A fire watch had already been established in areas utilizing Thermo-Lag as a fire barrier.

All Thermo-Lag fire barriers at RBS were declared inoperable on October 26, 1989. Hourly firewatch patrols have been in continuous operation since October, 1989. This supplement to LER 90-003 is submitted to provide a status of the Thermo-Lag issue at RBS. In a letter dated December 21, 1993, the NRC requested additional information regarding Generic Letter 92-08, pursuant to 10CFR50.54(f). In its response to the December 21, 1993, letter, RBS provided schedules for resolving Thermo-Lag issues. These schedules supersede previous actions related to Thermo-Lag.

The combination of the cable jacket properties, the control of transient combustibles, the use of suppression systems in the plant and the use of compensatory fire watches provides assurance that plant safety and the health and safety of the public has not been jeopardized.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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		90	-- 003 --	05	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**REPORTED CONDITION**

During the performance of Surveillance Test Procedure STP-000-3602 on 02/06/90 through 02/08/90 with the unit in Operational Condition 1 (full power), it was found that several minor deficiencies existed in the Thermo-Lag fire barrier envelopes around redundant safe shutdown circuits. These deficiencies consisted of small holes, cracks and unfilled seams in the Thermo-Lag material. Condition reports (CR) 90-0094, 90-0095, 90-0101, and 90-0106 were initiated to evaluate the conditions according to 10CFR50, Appendix R, fire barrier requirements. A fire watch had already been established in areas utilizing Thermo-Lag as a fire barrier, thus Technical Specification Section 3/4.7.7 action statement requirements had already been fulfilled. Since these deficiencies rendered the fire barrier inoperable and the unfilled seams existed since construction, this event is reportable pursuant to 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications.

This supplement to LER 90-003 is submitted to provide a status of the Thermo-Lag issue at River Bend Station.

**INVESTIGATION**

Thermo-Lag fire barriers have been under review at River Bend Station since late 1989. Potential discrepancies between the installation manual of Thermal Science Incorporated (TSI) (a GSU subcontractor during construction) and the actual site installation practices, and discrepancies between TSI installation manual and the qualification fire test results were discovered at that time. Due to these issues, the fire barriers were indeterminate for operability and firewatches were established for all areas utilizing Thermo-Lag as a fire barrier. An Informational Report was submitted to the NRC on 01/09/90 concerning this subject.

The performance of STP-000-3602 was intended to identify conditions in fire barriers where normal wear and tear had caused damage to the barriers. The small holes and miscellaneous cracks that were identified during the performance of the STP fall into this category. Normally a fire watch would be established and the holes and cracks would be repaired. However, the unfilled seams in the Thermo-Lag installations that were identified during the performance of the STP are a condition that must have existed from the time of initial construction and are not in accordance with either the vendor installation manual, nor normal site practices. In accordance with the vendor manual, the seams between boards of Thermo-Lag were to be prebuttered with a trowel grade material and then joined, or alternatively, dry fitted together with trowel grade material then applied to the joint. In either case, the seams were to have been grouted with the trowel grade material and they were not. The pre-existing firewatches satisfy the action statement of section 3/4.7.7 of the Technical Specifications. Eight fire areas were identified by the condition reports as having Thermo-Lag barriers exhibiting the unfilled seams. A brief description of each area follows.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Fire area C2A is the southeast cable chase at elevation 70 feet of the control building (\*NA\*). Fire area C2C is in the same cable chase but located at elevation 115 feet. These areas have safety related cabling feeding through up to the termination cabinets in the main control room. The areas have sprinkler suppression systems (\*KP\*) on the cable trays, which comprise the exposed fixed combustible in the areas. Area C6 is adjacent to area C2A on the west side. The area contains safety related air accumulators as well as safety related cabling. The exposed cables in cable trays, which comprise the exposed fixed combustible in the area, are protected by a sprinkler suppression system.

Fire area AB7/Z2 is located in the auxiliary building (\*NF\*) at elevation 95 feet in the southeast corner of the building. The area contains safety related instruments, piping and safety related cables. The cabling, which makes up the fixed combustible in the area, represents a fire loading of 1.0 hour. Fire area AB7 is the "D" tunnel located at elevation 70 feet on the south end of the auxiliary building. Safety related piping and motor operated valves (MOV) (\*FCV\*) are located in the area in addition to the safety related cabling. The cable trays and the MOVs are protected by a water deluge sprinkler system (\*KP\*).

Fire area FB1/Z1 is located at elevation 70 feet of the fuel building (\*ND\*). The area contains fuel pool cooling piping (\*DA\*) and equipment, reactor plant component cooling water piping (\*CC\*) and MOVs as well as safety related cabling. The crescent area, near the reactor building shield wall (\*NH\*), contains the major portion of the cable trays in the area. The cable trays represent a fire loading of 21 minutes and are the fixed combustible in the area. Fire areas FB3 and FB4 are the charcoal filter rooms located at elevation 148 feet of the fuel building. The ventilation system charcoal filters and fans are contained in the area. All cabling is routed in conduit in these areas. The charcoal filters are the fixed combustible for this area. They are protected by manually actuated water spray systems. The charcoal in each area is a fire loading of 45 and 46 minutes respectively for areas FB3 and FB4.

Fire area PT1 is the pipe tunnel at elevation 70 feet which extends from the standby cooling tower (\*CTW\*) to the fuel building. The area contains piping, MOVs, and instrumentation in addition to the safety related cabling. The cable trays are the only fixed combustible in the area and are protected by a sprinkler suppression system. The cable trays represent a fire loading of 29 minutes.

In addition to the Informational Report submitted on 01/09/90, LERs 87-005 and 89-009 were reviewed for similarity. This is the first time unfilled seams have been identified.

Since this condition was initially reported, the NRC issued Bulletin 92-01, "Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free From Fire Damage," and Bulletin 92-01, Supplement 1, "Failure of Thermo-Lag 330 Fire Barrier System to Perform Its Specified Fire Endurance Function." These documents notified RBS of failures in fire endurance testing associated with Thermo-Lag 330 fire barriers.



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CORRECTIVE ACTION

All Thermo-Lag fire barriers at RBS were declared inoperable on October 26, 1989, following an unsuccessful fire endurance test performed by RBS at Southwest Research Institute. Hourly firewatch patrols were immediately established in compliance with the compensatory action required by Technical Specification 3/4.7.7. These fire watch patrols have been in continuous operation since October, 1989.

In a letter dated December 21, 1993, the NRC requested additional information regarding Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers," pursuant to 10CFR50.54(f). In that letter, the NRC requested plans and schedules for resolving technical issues associated with Thermo-Lag. In its response to the December 21, 1993, letter, RBS provided schedules for resolving Thermo-Lag issues. These schedules supersede previous actions related to Thermo-Lag. In summary, for in-plant assemblies bounded by NUMARC testing and determined feasible for continued utilization, RBS will implement non-outage corrective actions within 24 months from receipt of the necessary documentation (i.e., NUMARC Application Guidelines and ampacity test reports). For assemblies not bounded by NUMARC testing, the selected corrective action(s) and a schedule for implementation will be provided via a supplement to the RBS response to the December 21, 1993, letter within 90 days of receipt of the final scope of the NUMARC generic test program.

SAFETY ASSESSMENT

The primary fixed combustible at River Bend in the areas containing the Thermo-Lag fire barrier material is cable jacketing on the electrical cables. The predominant type of cable used at River Bend is IEEE 383 rated which is resistant to ignition and is fire retardant.

Automatic fire detection systems are located in all areas, providing early detection if a fire should occur. Detection is provided by ionization and/or thermal type detectors.

Procedure FPP-0040 establishes controls for the use of transient combustibles throughout the protected area. The hot work permit procedure, FPP-0060, establishes controls associated with ignition sources.

In the areas containing one-hour rated barriers, automatic fire suppression systems are in place. Actuation of sprinkler systems in areas with open heads would occur upon a signal given by the detection system. In areas protected by a wet pipe system, sprinkler heads are fused to actuate at a temperature of 165 degrees Fahrenheit. Actuation of the sprinkler systems would be expected in time to provide protection for the required circuits.

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Also, as compensatory action in accordance with Technical Specification Section 3/4.7.7, a one-hour fire watch patrol has been in effect for the areas containing Thermo-Lag barriers since November 1989 as a result of Condition Report (CR) 89-1144. The actions of the fire watch are two fold. First, the patrols are to monitor an area for conditions likely to start and/or spread fire and for compliance with housekeeping requirements. These actions are designed to maintain the combustible loading in each area at the acceptable levels. The second function is to inspect for evidence of fire. The objective is to discover indications of a fire prior to activation of the detection system. Based on the discussion above, the defense-in-depth approach utilized on-site provides assurance that plant safety and the health and safety of the public is not compromised.

Note: Energy industry identification system codes are indicated in the text as (\*XX\*).