GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

AREA CODE 504 635-6094 346-8651

April 30 1992
RBG- 36787
File Nos. G9.5, G9.25.1.3

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

Gentlemen:

River Bend Station - Unit 1
Docket No. 50-458

Please find enclosed Supplement 1 to Licensee Event Report No. 92-003 for River Bend Station -Unit 1. This report is submitted pursuant to 10CFR50.73.

Sincerely,

W.H. Odell
Manager - Oversight
River Bend Nuclear Group

LAE/PDG/JRH/DCH/DCJ/kvm

cc: U.S. Nuclear Regulatory Commission
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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
RIVER BEND STATION	0 5 0 0 0 4 5 8	1 OF 0 5

TITLE (4) DEVIATIONS FROM APPROVED DESIGNS IN STRUCTURAL STEEL FIREPROOFING

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
										0 5 0 0 0
0 2	2 2	9 2	9 2	— 0 0 3	— 0 1	0 4	3 0	9 2		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	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 (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		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	
	AREA CODE	
L.A. ENGLAND, DIRECTOR - NUCLEAR LICENSING	5 0 4	3 8 1 - 4 1 4 5

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At 1500 hours on Feb. 22, 1992, with the reactor in Operational Condition 1 (Power Operation), while performing a review of design specification 210.505, "Fireproof Coatings", it was determined that the structural steel supporting required fire barrier walls and floors could not be considered as being protected to a fire resistance rating of 3 hours in accordance with Underwriters Laboratories (UL) tested designs. Although the condition was detected on February 22, 1992, it has existed since plant startup. Therefore, this report is submitted pursuant to 10CFR50.73 (a)(2)(i)B as operation prohibited by the Technical Specifications. The primary root cause identified is that an inadequate level of engineering evaluation was applied in the development of the fire barrier designs.

All of the safety-related areas employing structural steel to support fire barriers are provided with automatic fire detection systems. Early warning detection systems with automatic suppression systems or low combustible loadings minimize the possibility of a fire reaching fully developed stages where failure temperatures could be reached.

REPORTED CONDITION

At 1500 hours on Feb. 22, 1992, with the reactor in Operational Condition 1 (Power Operation), while performing a review of design specification 210.505, "Fireproof Coatings", it was determined that the structural steel supporting required fire barrier walls and floors could not be considered as being protected to a fire resistance rating of 3 hours in accordance with Underwriters Laboratories (UL) tested designs. Although the condition was detected on February 22, 1992, it has existed since plant startup. Structural steel forming or supporting fire-rated walls or floors forms part of the fire barrier assembly to prevent the spreading of fires from one fire area to another. The as-built configurations not meeting the three-hour fire rating cannot be considered to have been operable pursuant to Technical Specification 3/4.7.7. Therefore, this report is submitted pursuant to 10CFR50.73 (a)(2)(i)B as operation prohibited by the Technical Specifications.

INVESTIGATION

River Bend Station USAR Section 9.5.1, page 9A.3-18 requires the structural steel supporting fire barriers to be protected to a fire resistance rating of 3 hours in accordance with UL tested designs. During a review of specification 210.505, it was noted that variations and deviations to the UL tested designs allowed by the specification could reduce the fire resistance rating of the protected steel members. Inspection of the as-built construction of the fireproofing material verified the existence of these deviations. The investigation and review of the fireproofing requirements was being performed as part of the corrective action required for fire barrier deficiencies identified by RBS Corrective Action Report CAR-S-8901. Following discovery, an effort was made to identify all of the impacted areas to ensure that compensatory fire watches per Technical Specification 3/4.7.7 were in place.

Specification 210.505 allowed alternate configurations for the application of fireproofing to beams and columns when they were in close proximity to a wall. In the UL tested configurations, the columns and beams are protected around their entire exposed perimeter with fireproofing material. Specification 210.505 permitted alternate designs in which the fireproofing construction was extended out and attached directly to the walls. The alternate configurations were not sufficiently detailed with respect to attachment method and spacing to determine exactly how they were constructed. With insufficient construction details the alternate configurations could not be evaluated for adequacy with respect to fire endurance.

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

Another discrepancy identified in the specification pertains to attachments to protected steel members. The specification required that supplementary steel (non slab supporting steel members framing between main slab supporting members) be protected with fireproofing to a minimum distance of 18 inches from point of attachment to the main members. No tests or evaluations were found to substantiate this 18 inch protection rule. Additionally, other types of attachments to the protected steel members not considered as "supplementary steel" were not addressed in the specification.

The test methods employed by UL in qualifying structural steel assemblies for fire resistance are described in UL Publication 263, "Standard for Safety, Fire Tests of Building Construction and Materials". UL 263 requires that the test specimen be representative of the construction for which classification is desired. Additionally, the specimen is to be loaded throughout the fire endurance test to the maximum loads permitted by nationally recognized design standards. The conditions of acceptance for the specimen include maximum temperature limitation of the steel member and that the steel member sustain the applied loads throughout the fire endurance test.

The UL tested designs utilized at RBS require the fireproofing material to be applied directly to the exposed perimeter of the steel member, and do not include attachments to the protected steel members. These attachments can impact the protected steel member by increased heat intrusion, and thermally induced stresses in main members when heavy steel attachments are framed between main members. However, the alternate fireproofing configurations allowed by specification 210.505 may be considered acceptable in protecting the steel from heat intrusion if it can be demonstrated that the material would remain in place during fire exposure.

ROOT CAUSE

A root cause evaluation was performed using the technique of barrier analysis. The results of the root cause analysis are summarized below.

The original fireproofing specification required the fireproofing construction to have a 3 hour fire resistance rating in accordance with UL approved designs. However, the specification also contained variations and deviations from the UL approved designs that could impact the performance of the structural steel assembly under fire conditions. There were no fire tests, engineering evaluations, or industry standards referenced to substantiate the variations and deviations from the UL tested designs. The 18 inch protection rule for supplementary steel attachments suggests that consideration was given to the impact on the protected steel member.

In conclusion, the primary root cause is that an inadequate level of engineering evaluation was applied in the development of the fire barrier designs.

A similarity review of previous LERs revealed that conditions reported in LER 88-009 included a deficiency in the fire rating of a structural steel member in the auxiliary building D tunnel, 70' elevation. This steel member comprised the top three feet of the south fire-rated wall and was not qualified as a three-hour fire barrier per the UL designs. Modification request 88-0220 was implemented to protect this beam to provide the proper level of fire rating.

CORRECTIVE ACTION

Upon discovery of the reported condition the structural steel fireproofing was declared inoperable. Limiting Condition for Operation action statements specified by Technical Specification 3/4.7.7 were implemented in all safety related areas where structural steel is required to support fire barrier walls/floors.

The condition identified in this LER is that installed fireproofing configurations do not comply with all UL test requirements for assignment of a 3 hour fire resistance rating. UL tested designs provide the bases for the structural steel fireproofing at RBS. Replication of UL tested designs is seldom possible or practical, and is not expected to be achieved.

The fire barrier task force formed resulting from RBS CAR-S-8901 will identify structural steel fireproofing configurations within safety related areas that do not conform to UL tested designs. Installed configurations that differ from the UL tested designs will be evaluated to determine overall impact on the fire resistance rating of the structural assembly. Actual fire hazards and the level of fire protection provided in the area of concern may be considered in determining the adequacy of the installed configurations. In situations where the installed configuration is considered inadequate, additional corrective actions will be implemented.

Design engineering is presently revising the fireproofing specification. The revision will add appropriate detail and references to ensure that fireproofing construction conforms to specified design requirements. The revision will also include improvements to the QA program requirements within the specification.

The above corrective actions will be completed on the schedule established for the fire barrier task force, as described in LER 89-010, Revision 3.

NRC FORM 366A (6-89) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104 EXPIRES 4/30/92

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

SAFETY ASSESSMENT

Although a full 3 hour rating can not be claimed for the structural steel fireproofing, a significant level of protection was provided by the existing designs. Limiting arithmetic average steel temperatures established by UL during fire exposure for columns and beams are 1000 degrees F and 1100 degrees F respectively. A fire would have to grow well beyond incipient stages for a substantial length of time to bring compartment temperatures to the failure point for the structural assemblies.

All of the safety-related areas employing structural steel to support fire barriers are provided with automatic fire detection systems. Fixed combustibles in these areas is primarily composed of IEEE 383 rated cable. All areas containing substantial quantities of fixed combustibles are provided with automatic suppression systems. Early warning detection systems with automatic suppression systems or low combustible loadings minimize the possibility of a fire reaching fully developed stages where failure temperatures of the structural steel assemblies could be reached.