GULF STATES UTILITIES COMPANY

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

AREA CODE 504 635-6094 346-8651

July 31, 1991
RBG- 35404
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 Licensee Event Report NO. 91-012 for River Bend Station - Unit 1. This report is submitted pursuant to 10CFR50.73.

Sincerely,

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

IAE/PDG/GAB/DCH/OJB/kvm

cc: U.S. Nuclear Regulatory Commission
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IE22
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NRC FORM 366 (5-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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.

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

TITLE (4): ESF Actuations Caused by the Loss of the Division II RPS Bus due to Improper Assembly of a Breaker Termination

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 7	0 2	9 1	9 1	0 1 2	0 0					0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	X 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)	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
L.A. England, Director - Nuclear Licensing	AREA CODE: 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	
B	J E	B K R	G 0 8 0	Y							

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 1256 on July 2, 1991 with the reactor in Operational Condition 1 (Power Operation), a loss of the Division II reactor protection system (RPS) bus occurred due to the trip of the normal power supply. This resulted in a Division II balance-of-plant (BOP) isolation and the initiation of the control building ventilation, fuel building ventilation, standby gas treatment and annulus mixing systems. Breaker 8B located in RPS panel 1C71-P002 was de-energized pending further investigation. Then at 2256 on July 2, 1991, another loss of the Division II RPS bus occurred due to the trip of the alternate power supply resulting in another Division II BOP isolation. This occurred due to an inadvertent short, during rework addressing the original problem. Following this occurrence, the breaker was replaced and returned to service with no further incidents. This report is submitted pursuant to 10CFR50.73(a)(2)(iv) to document these ESF actuations.

Based on GSU's investigation, it appears that the root cause of the first occurrence was improper assembly by the vendor resulting in arcing of a loose termination on the line side terminal of a breaker supplied by the manufacturer as part of a panel. The second occurrence was initiated by the inadvertent short of a line to ground during rework to address the first occurrence. For each occurrence, all safety systems functioned per their design and the ESF systems were restored within minutes.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
RIVER BEND STATION	0 5 0 0 0 4 5 8	9 1	— 0 1 2	— 0 0	0 2 OF 0 4

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

REPORTED CONDITION

At 1256 on July 2, 1991 with the reactor in Operational Condition 1 (Power Operation), a loss of the Division II reactor protection system (RPS) bus (*BU*) occurred due to the trip of the normal power supply. This resulted in a Division II balance-of-plant (BOP) isolation and the initiation of the control building ventilation (*VI*), fuel building ventilation (*VG*), standby gas treatment (*BH*) and annulus mixing systems. Breaker (*BKR*) 8B located in reactor protection system (RPS) panel (*PL*) 1C71-P002 was de-energized pending further investigation. Then at 2256 on July 2, 1991, another loss of the Division II RPS bus (*BU*) occurred due to the trip of the alternate power supply resulting in a repeat actuation of the same engineered safety features (ESF) systems. This occurred due to an inadvertent short, during rework addressing the original problem. Following this occurrence, the breaker (*BKR*) was replaced and returned to service with no further incidents. This report is submitted pursuant to 10CFR50.73(a)(2)(iv) to document these ESF actuations.

INVESTIGATION

During the occurrence at approximately 1256 a half-scram and half-isolation and associated ESF actuations were received as a result of the loss of 1C71-S001B which is the motor-generator (MG) for RPS bus (*BU*) B. The MG 1B (*MG*) is the normal source of power to RPS bus B. When the normal source of power was lost, the alternate source of power was selected in the control room to re-establish a power source to the RPS bus.

The initial investigation following the 1256 occurrence revealed these observations and actions by the at-the-controls (ATC) operator:

1. Half scram Div II average power range monitor (APRM) D or H.
2. The half scram was reset.
3. Half scram Div II APRM D or H and loss of RPS "B".
4. RPS "B" was swapped to alternate power supply.
5. The half isolations and half scram were reset.
6. Half scram Div II APRM D or H.
7. Attempted to reset half scram unsuccessfully. It kept tripping.
8. The half scram was left in.

A subsequent attempt to reset the half-scram was successful, but only temporarily. When the half-scram returned, a system engineer using a voltmeter determined that there was no power to panel (*PL*) 1H13*PNL694. This was the panel which was giving the half scram. Using the reference drawings, it was determined that the power source for the panel was supplied by panel (*PL*) 1C71-P002 breaker number (*BKR*) 8B. After the covers were removed, a system engineer, an operator and an electrical technician personally witnessed arcing on the line side of breaker (*BKR*) number 8B. At the time the arcing occurred, the control room verified that the power was restored to panel (*PL*) 1H13*PNL694. A closer inspection of the line side of the breaker (*BKR*) revealed that a split washer was not in full compression. After further review, it was then determined that it would be better to open the number 8B breaker and deliberately enter a half scram rather than alternate into and out of the half scram. An inspection was performed on all of the line and load side screws to verify that the remaining terminations were tight.

An attempt was made to re-tighten and torque the screw termination. However, the screw could not be tightened. After further review, the decision was made to replace the screw, and the associated split washer and flatwasher. To replace these components, it was necessary to use a pair of insulated needle-nose pliers. During replacement, the pliers slipped and thus grounded the bus (*BU*). This occurred at 2256 and resulted in the second occurrence of a Division II BOP isolation. The control room quickly transferred back to the normal source of power to the RPS bus (*BU*). This arc to ground caused damage to the breaker (*BKR*) which required it to be replaced. When the old breaker was removed, it was evident that the hole in the breaker mounting bar was not lined up with the stud, and that the threads in the stud were slightly galled. A new breaker (*BKR*) was obtained, and the threads in the stud were dressed. Operations removed the RPS bus (*BU*) from service and the new breaker (*BKR*) was installed and returned to service without further incident.

Finally, a condition report (CR) search was performed to verify if any incidents occurred which were similar to this event. CR's 87-0015, 87-1702, 87-1658, 86-1900, 86-0351, and 86-0347 surfaced. Although these CR's are similar, various corrective actions and some ongoing investigations appeared to have corrected the specific problems identified by these CRs.

ROOT CAUSE

Based on the above investigation, it appears that the root cause of the first occurrence was improper assembly by the vendor resulting in arcing of a loose termination on the line side terminal of a breaker (*BKR*) supplied by the manufacturer as part of a panel (*PL*). The pattern of

alternating between having panel 1H13*PNL694 energized and de-energized and thus, the alternating of the half-scram condition was due to this arcing phenomenon. The second occurrence was initiated by the inadvertent line to ground short during rework to address the first occurrence.

A review of previous LERs identified one having limited similarity. LER 90-012 reported an ESF actuation due to a loss of the Division II RPS bus. However, the root cause was the failure of a voltage regulator in the motor generator set.

CORRECTIVE ACTION

The breaker (*BKR*) was replaced and the termination was reworked. A visual inspection of the Division II panel (*PL*) confirmed that the remaining terminations were tight. A visual inspection was also performed on the Division I panel (*PL*). As a result, a maintenance work order (MWO) has been generated to rework one potentially loose termination during the next scheduled Division I RPS bus (*BU*) outage.

SAFETY ASSESSMENT

For each occurrence, all safety systems functioned per their design and the ESF systems were restored within minutes.