

**GULF STATES UTILITIES COMPANY**

IVER BEND STATION      POST OFFICE BOX 220      ST. FRANCISVILLE, LOUISIANA 70775  
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March 16, 1992  
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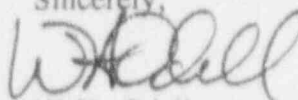
U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Gentlemen:

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

Please find enclosed Licensee Event Report No. 92-001 for River Bend Station - Unit 1. This report is submitted pursuant 10CFR50.73.

Sincerely,



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

  
LAE/PDG/EMC/DCH/DRC/kvm

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TE-22

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P330) U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET WASHINGTON, DC 20503.

## FACTS

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REACTOR SCRAM DUE TO POWER SUPPLY FAILURE WITH DIVISION II REACTOR  
PROTECTION SYSTEM PREVIOUSLY TRIPPED

内定3名額、未定11名(定員14名)の2倍、3倍の倍率

0000-0001-9100-9100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 6 (Check one or more of the following) (1)

1:0:0

**980**

993-3444

1994年12月

2000-2001 871  
7454.5

LICENSEE CONTACT FOR THIS LER (12)

上巻：江戸の町と 下巻：江戸の町

5.0, 4.3, 8.1, -4.1, 4.5

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

SUPPLEMENTAL REPORT EXPECTED 11/01

☒ YES (If yes, complete EXPECTED SUBMISSION DATE)

50

EXPECTED  
SUBMISSION  
DATE (18)

MONTH	DAY	YEAR
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ABSTRACT Limit to 1400 spaces - a approximately fifteen single space by double line lines 118

At 2328 on 02/15/92 with the unit at 100% power (Operational Condition 1) a loss of power to average power range monitors (APRMs) "C" and "G" resulted in a trip of the Division I reactor protection system (RPS) and a reactor scram. The Division II RPS had been previously placed in the tripped condition due to the failure of a surveillance test on the scram discharge volume (SDV) water level instrumentation. Following the reactor scram, normal switchgear NPS-SWG1A failed to fast transfer to the preferred station service transformer, 1RTX-XSR1A. However, an automatic slow transfer to the preferred station service transformer was successfully completed. This report is submitted pursuant to 10CFR50.73(a)(2)(iv), as an RPS actuation.

The reactor scram placed the unit in a safe shutdown condition and all safety systems functioned as designed. The failure of normal switchgear NPS-SWG1A to fast transfer to the preferred station service transformer, 1RTX-XSR1A, resulted in the loss of loads supplied by the normal switchgear, none of which are safety-related. All standby service water pumps functioned as designed and automatically started on low service water header pressure.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (PS30), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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RIVER BEND STATION	0 5 0 0 0 4 5 8 9 2	—	0 0 1	—	0 0 0	2 OF 0 5

TEXT (if more space is required, use additional NRC Form 388A's) (17)

**REPORTED CONDITION**

At 2328 on 02/15/92 with the unit at 100% power (Operational Condition 1) a loss of power to average power range monitors (APRMs) "C" and "G" resulted in a trip of the Division I reactor protection system (RPS) (\*JE\*) and a reactor scram. The Division II RPS had been previously placed in the tripped condition in accordance with Technical Specification 3.3.1 due to the failure of a surveillance test. This report is submitted pursuant to 10CFR50.73(a)(2)(iv), as an RPS actuation.

**INVESTIGATION**

At 1957 on 2/15/92, the Division II RPS was placed in the tripped condition in accordance with Technical Specification (TS) 3.3.1 due to an unsuccessful performance of a surveillance test procedure (STP). This STP was a channel functional test of the scram discharge volume (SDV) water level - high instrumentation. The logic input to the RPS tested satisfactorily; however, the alarm function failed and the channel was declared inoperable. The loss of power to APRMs "C" and "G" resulted in a trip of Division I at 2328. With both Divisions in the tripped condition, a reactor scram followed immediately, per design.

Following the reactor scram, normal switchgear NPS-SWG1A failed to fast transfer to the preferred station service transformer, 1RTX-XSR1A. However, an automatic slow transfer to the preferred station service transformer was successfully completed. The transfer resulted in the loss of loads supplied by the normal switchgear, including normal service water pumps 1A and 1C, circulating water pumps 1A and 1C, instrument air compressor 1A, and reactor recirculation pump A. All standby service water pumps functioned as designed and automatically started on low service water header pressure.

GSU's investigation focused on the three major aspects of this event, as follows:

**1. Scram Discharge Volume Instrumentation**

GSU's investigation determined that the SDV water level instrumentation failure resulted from relay 1C71A-K1D not being fully inserted into its base. The relay was subsequently seated and the required channel functional test was successfully completed. Surveillance test procedure history data indicates that the last performance of STP-500-4505 occurred on January 16, 1992 with no adjustments required. Performance of this procedure verified that the relay was functional; however, it did not verify that the relay was properly inserted. Relay 1C71A-K1D is located in panel 1H13-P694 and is in an area difficult to access. Therefore, it is unlikely that normal maintenance activities in this cabinet would have caused this relay to be moved or bumped. The root cause of this condition is indeterminate; however, a panel walkdown was performed to ensure no other relays were in like condition and none were found. A maintenance history review of this relay was performed and revealed no other reported problems.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 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 (3100-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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

## 2. APRM Power Supply

The investigation of the loss of power to APRMs "C" and "G" determined that power supply PS23 had failed. Initial analysis of the power supply revealed that an aluminum electrolytic capacitor had failed. The power supply was replaced and functional checks were satisfactorily performed. The power supply was within its required shelf-life at the time of installation and has been in service for a period less than its maximum operating life. No work was being performed on the APRM system at the time of the failure.

Aluminum electrolytic capacitors contain two aluminum electrodes with a dielectric that consists of an aluminum oxide layer on the anode electrode. This type of capacitor permits a small amount of dc leakage which is dependent on the value of the capacitor and the dc voltage applied. This characteristic changes as the capacitor ages and eventually results in failure of the capacitor. Since no external cause for the sudden catastrophic failure of the capacitor is apparent, the probable root cause of the failure is excessive dc current leakage.

In order to ascertain a more definitive root cause, the failed power supply will be returned to General Electric for failure analysis. Details of this analysis will be forwarded in a supplement to this report.

## 3. Failure to Fast Transfer

Investigation of the failure of 1NPS-SWG1A to fast transfer showed that breaker ACB11 failed to close as designed. The cause of the failure to close was binding in the breaker's cam follower roller and the small linkage follower rollers. The binding was attributed to dried and hardened grease. During disassembly several bearings were found to be dry and required cleaning and lubrication. The condition of the grease appeared to be caused by contaminants. Contamination of grease has been an emerging issue in the nuclear industry. River Bend Station's initial preventive maintenance procedures for circuit breakers required a visual inspection of the breaker components and addition of grease as required. These procedures have since been revised to include a visual inspection of the grease with requirements to notify the system engineer in cases where the grease exhibits anything other than a new appearance. Based upon the condition of the grease, the system engineer would recommend corrective action, including complete replacement of the grease. The failed circuit breaker had not received this upgraded preventive maintenance subsequent to the procedure revision.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-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.

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

ROOT CAUSEScram Discharge Volume Instrumentation

The high level alarm relay was not fully seated in its base. The root cause was indeterminate based on a maintenance history search and inspection of this and similar relays with no other deficiencies identified.

APRM Power Supply

The APRM power supply failed due to failure of an aluminum electrolytic capacitor. The probable root cause of the capacitor failure is excessive dc current leakage. However, neither the shelf life nor the service life of the power supply was exceeded. In order to ascertain a more definitive root cause, the failed power supply will be returned to General Electric for failure analysis.

Failure to Fast Transfer

The failure to fast transfer was due to failure of circuit breaker ACB11 to close as designed. The root cause of the breaker failure is that the failed circuit breaker had not received upgraded preventive maintenance subsequent to the preventive maintenance procedure revision. Corrective actions have already been implemented. Preventive maintenance procedures have been revised to include a visual inspection of grease condition and System Engineering notification anytime grease is found to be in less than new condition.

A review of previous LERs revealed no similar events.

CORRECTIVE ACTIONScram Discharge Volume Instrumentation

A control room panel walkdown was performed to ensure all relays were fully inserted into their base. All relays were found to be fully inserted. STP-500-4505, "RPS - Scram Discharge Volume Water Level High, Monthly Channel Functional (C11-N012D; C11-N601D)" was satisfactorily performed to prove operability of the SDV level instrumentation and alarm function.

APRM Power Supply

The applicable surveillance procedures were satisfactorily performed to demonstrate operability of the APRM functions. The failed power supply will be sent to the vendor for failure analysis. A supplemental report will be submitted to provide the results of the analysis.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

Failure to Fast Transfer

Circuit breaker ACB9 was moved to the ACB11 cubicle. A spare breaker was moved into the ACB9 cubicle. Both breakers occupying ACB9 and ACB11 cubicles were then placed in normal plant lineup. To verify operability, fast transfer was successfully accomplished three times. To determine the magnitude of grease degradation and contamination, two Class 1E 4.16 KV breakers and five Cat II 13.8 KV breakers were visually checked. The grease in both the Class 1E and Cat II breakers was in acceptable condition. During refueling outage 4, all Class 1E breakers of this type are scheduled for preventative maintenance. Also, all 1NPS-SWG1A 13.8 KV circuit breakers (Cat II breakers) are scheduled for maintenance. All 13.8 KV and 4.16 KV maintenance procedures require System Engineering involvement anytime grease is found to be in less than new condition. Should the results of this maintenance indicate a generic problem, all 13.8 KV circuit breakers will have the preventive maintenance performed. The results of this planned preventive maintenance will be provided in the supplement to this report.

SAFETY ASSESSMENT

The reactor scram placed the unit in a safe shutdown condition and all safety systems functioned as designed.

The failure of normal switchgear NPS-SWG1A to fast transfer to the preferred station service transformer, 1RTX-XSR1A, resulted in the loss of loads supplied by the normal switchgear, none of which are safety-related. All standby service water pumps functioned as designed and automatically started on low service water header pressure.