

OCT - 4 1990

In Reply Refer To:  
Docket: 50-458/90-200

Gulf States Utilities  
ATTN: James C. Deddens  
Senior Vice President (RBNG)  
P.O. Box 220  
St. Francisville, Louisiana 70775

Gentlemen:

Thank you for your letter of September 18, 1990, in response to our letter and Notice of Violation dated August 17, 1990. We have reviewed your reply and find it responsive to the concerns raised in our Notice of Violation. We will review the implementation of your corrective actions during a future inspection to determine that full compliance has been achieved and will be maintained.

Sincerely,

Original Signed By:  
**Thomas P. Gwynn**

Samuel J. Collins, Director  
Division of Reactor Projects

cc:  
Gulf States Utilities  
ATTN: J. E. Booker, Manager-  
Nuclear Industry Relations  
P.O. Box 2951  
Beaumont, Texas 77704

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Gulf States Utilities  
ATTN: Les England, Director  
Nuclear Licensing  
P.O. Box 220  
St. Francisville, Louisiana 70775

*J*  
RIV:RI:OPS  
for TMckernon/cjg 10/2/90  
*J*  
C:OPS  
for JGagliardo 10/2/90  
*J*  
D:DRP  
LJCallan 10/2/90  
*J*  
D:DRP  
for SJCcollins 10/3/90

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10/03/90 via telcon

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Gulf States Utilities

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Cajun Electric Power Coop. Inc.  
ATTN: Philip G. Harris  
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Department of Environmental Quality  
ATTN: William H. Spell, Administrator  
Radiation Protection Division  
P.O. Box 14690  
Baton Rouge, Louisiana 70898

U.S. Nuclear Regulatory Commission  
ATTN: Resident Inspector  
P.O. Box 1051  
St. Francisville, Louisiana 70775

U.S. Nuclear Regulatory Commission  
ATTN: Regional Administrator, Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

bcc to DMB (IE01)

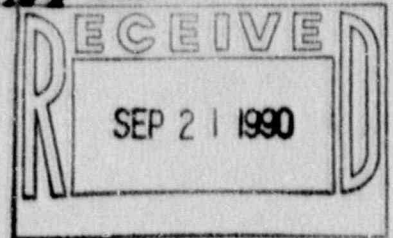
bcc distrib. by RIV:

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**GULF STATES UTILITIES COMPANY**

RIVER BEND STATION POST OFFICE BOX 220 ST FRANCISVILLE LOUISIANA 70775  
AREA CODE 504 635 6094 346 8651



September 18, 1990  
RBG-33597  
File Nos. G9.5, G15.4.1

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

Gentlemen:

River Bend Station - Unit 1  
Refer to : Region IV  
Docket No. 50-458/90-200

Pursuant to 10CFR2.201, this letter provides Gulf States Utilities Company's (GSU) response to the Notice of Violation for NRC Inspection Report No. 50-458/90-200. The special team inspection was conducted of the electrical distribution system during the period May 21 through June 22, 1990, of activities authorized by NRC Operating License NPF-47 for River Bend Station - Unit 1. GSU's response to the violation is provided in the enclosure. This letter is being submitted at this time pursuant to a conversation with Mr. L. Constable today.

Should you have any questions, please contact Mr. L. A. England at (504) 381-4145.

Sincerely,

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

TFP/~~EAC~~/JWC/JRH/FRC/pg  
Enclosure

cc: U. S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, TX 76011

Senior Resident Inspector  
Post Office Box 1051  
St. Francisville, LA 70775

IC-90-276

~~CONFIDENTIAL~~  
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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

STATE OF LOUISIANA )

PARISH OF WEST FELICIANA )

In the Matter of )

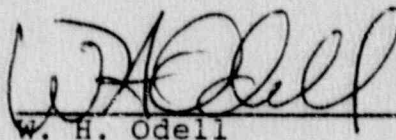
GULF STATES UTILITIES COMPANY )

Docket No. 50-458

(River Bend Station - Unit 1)

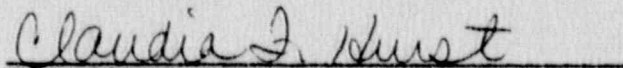
AFFIDAVIT

W. H. Odell, being duly sworn, states that he is a Manager - Oversight for Gulf States Utilities Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.



W. H. Odell

Subscribed and sworn to before me, a Notary Public in and for the State and Parish above named, this 18<sup>th</sup> day of September, 1990. My Commission expires with Life.



Claudia F. Hurst  
Notary Public in and for  
West Feliciana Parish, Louisiana

**RESPONSE TO NOTICE OF VIOLATION 50-458/90200-01**  
**LEVEL IV**

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REFERENCE

Notice of Violation - Letter from S. J. Collins to J. C. Deddens, dated August 17, 1990.

Inspection Report - Letter from D. M. Crutchfield to J. C. Deddens, dated August 1, 1990.

FAILURE TO VERIFY OR TO CHECK THE ADEQUACY OF DESIGN

Criterion III of Appendix B to 10 CFR Part 50, requires that design control measures be established for verifying or checking the adequacy of design, and for assuring that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, the NRC inspectors identified the following examples of the failure to verify or to check the adequacy of design.

1. Emergency diesel generators (EDGs) 1 and 2 loading calculations did not analyze the sequencing of loads over the full time band of the load sequence timers, and hence the potential for overloading the EDGs existed. The loading calculations for EDGs 1 and 2 did not analyze the differences between the actual accident transient loads and the loads simulated in the EDG manufacturer's shop test. The loading calculations for EDG 3 did not demonstrate that the EDG 3 would pick up loads in the proper sequence without overloading the diesel.
2. Postulated failures of Division 3 bus loads (HPCS and SSW pump motors) during a "fast-transfer" of this bus to the preferred offsite power source had not been analyzed.
3. The short circuit calculations did not consider the potential for low short circuit protection margins for certain EDS equipment that could occur when the EDGs were tested in parallel with the offsite grid. In addition, short circuit calculations incorrectly assumed a 1.0 PU (per unit) voltage while the plant conditions allowed up to 1.05 PU voltage.
4. Calculations for the sizing of grounding resistors did not include the sizing of the EDG 3 grounding resistor and did not analyze the current and thermal sustaining capability of the EDGs 1 and 2 grounding resistors.
5. Postulated failures of Division 3 bus loads, because of the EDG 3 high resistance ground scheme incorrectly annunciating ground faults, had not been analyzed.

6. Short circuit calculations to demonstrate the protection and coordination of 125-V DC and 120-V AC control circuits had not been performed.
7. The potential failure of the standby service water system to initiate because of one operating normal service water pump keeping header pressure above the low differential pressure set point had not been analyzed.
8. The potential of the EDG air start system receiver pressure dropping to a level that was just above the Technical Specification limit and possibly preventing the automatic start of the EDG had not been analyzed.
9. Excessive hydraulic stress on mechanical piping during simultaneous starting of two standby service water pumps had not been analyzed.

#### REASON FOR THE VIOLATION

GSU retained General Electric Company (GE) and Stone & Webster Engineering Corporation (SWEC), the architect-engineer, to design and construct RBS in accordance with regulations for commercial power plants, industry codes and standards, and the design bases described in the license application. Under the umbrella of the GSU quality assurance program, GE and SWEC quality assurance programs functioned to assure a quality design product such that structures, systems, and components will satisfactorily perform their safety functions.

GE and SWEC quality assurance organizations issued appropriate procedures, provided quality training, audited engineering and design work, reported to management on performance of projects and disciplines, and acted to assure the satisfactory completion of any required corrective actions. For completeness and acceptability of the design, a system of thorough review and checking, accomplished by competent independent technical personnel, was applied to calculations, specifications, drawings, and other documents. Assurance that adequate design reviews were performed by SWEC and GE was handled through planned and periodic audits conducted by GSU personnel not having direct responsibilities in the area audited.

GSU was assured through this process that the design and the design control measures used on RBS are adequate. Notwithstanding the specific deficiencies identified by the EDSFI and other reviews, GSU remains convinced that there are no overall programmatic or systematic weaknesses in the design process and that technically adequate calculations are available to support the design. GSU acknowledges the specific examples in the violation as valid, but does not consider them, either collectively or individually, to represent generic or systematic concerns and therefore concludes the design and the design control process used on RBS has been adequate.

## CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

The following steps which have been taken with respect to the specific examples to address any plant operability questions which may have existed:

- a) The operating configuration for Division III has been restricted such that a fast transfer does not occur and the Division III EDG is not tested in a configuration that would risk fault current in excess of the switchgear capability. (Example 2)
- b) Plant procedures have been revised to prohibit transfer of Division III from EDG 3 to the offsite source with a ground fault present. (Example 3)
- c) An analysis of the control circuit fuse coordination has been prepared which shows that no common mode failure exists and that the single failure criterion has been satisfied. (Example 6)
- d) An analysis of the standby service water system initiation has been performed which shows that low-system pressure actuation will occur. (Example 7)
- e) An alarm is available at a higher EDG air start system pressure to alert the operators to low-system pressure and procedures in effect at the time of the EDSFI require the operators to increase the pressure to above this alarm point should the alarm annunciate. (Example 8)

## CORRECTIVE STEPS WHICH WILL BE TAKEN TO PREVENT FURTHER VIOLATIONS

GSU took over the design control process from SWEC at approximately the time of initial startup of RBS. The EDSFI inspectors were satisfied with the procedure currently used by RBS engineering personnel to perform calculations. As calculations are revised, either routinely or in conjunction with major design evaluation programs such as that required by NRC Generic Letter 89-10, they are updated to the requirements of this procedure. Examples of EDSFI calculation shortcomings will be added to the procedure to alert engineers of the type of problems identified by the EDSFI team.

GSU QA audits design control periodically in accordance with Technical Specifications to provide assurance of an adequate and effective program. The deficiencies identified will be reviewed and steps taken to alert the auditors during the design control audit process of the types of deficiencies found in the EDSFI inspection.

The specific actions being considered for each specific example are delineated below:

Example 1 - EDG loading calculation assumed fixed time

for load sequencing and did not address timer tolerance. This was shown not to be significant during the inspection and the appropriate calculation will be revised to include this information. EDG loading calculations used the manufacturer's shop test as the allowable upper limit for loading. Differences between actual loads and shop test loads were not analyzed in the calculation. The results of Special Situation Test (SST) 38, which was performed during start-up, demonstrated the capability of the EDG loading. Additional analysis will be performed to supplement the calculation.

Example 2 - The ability of the HPCS pump motor and the standby service water pump motor to withstand high transient torques resulting from a fast transfer was not addressed. RBS is currently operating such that neither motor can be subjected to a fast transfer and will remain this way until this item is resolved. We are considering the following resolution options:

- a) Analyze the effect of a fast transfer on the HPCS and SSW pump motors to show that such a transfer is not significantly detrimental.
- b) Permanently disable the bus fast transfer capability to assure that the motors are not subjected to such transients.
- c) Continue to supply the Division III bus from offsite sources indefinitely.

Example 3 - Short circuit calculations for the Division III EDG do not fully address operation in parallel with the main generator or the grid during testing. Specific electrical fault cases exist where switchgear interrupting ratings could be exceeded. RBS is operating in a configuration which will preclude such cases and will continue until revised calculations are performed that indicate that these cases are within the capability of the switchgear. Should the calculation indicate that cases exist where the switchgear interrupting rating is exceeded, the following options would be considered:

- a) Perform a Probabilistic Risk Assessment of a fault during the performance of the required testing.
- b) Impose operational restrictions on the bus loading for the period when the testing is performed.
- c) Install a modification to limit the available fault current at the Division III switchgear.

Example 4 - The grounding resistor sizing calculation for EDG 1 and 2 did not analyze their current and thermal capabilities. The analysis will be added to the calculation. The calculation for sizing the EDG 3 grounding resistor was not available to the



inspectors. It is believed to be contained in the General Electric design record files in San Jose and GSU has requested that the calculation be made available for local review by GSU personnel. Should the calculation not be available for review, GSU will perform the calculation to verify that the grounding resistor is properly sized and rated.

Example 5 - The grounding resistor on the EDG is sized such that a continuous ground fault will be limited to a very low value and will have no impact on the Division III operation. However, should offsite power be restored to the Division III bus with a ground fault still present, the available fault current will rise to approximately 1000 amps and could impact Division III operation. Plant procedures have been revised to prohibit transfer to the off-site source with a ground fault present.

Example 6 - An analysis for the short circuit protection of 125 Vdc and 120 Vac control circuits had not been performed. An analysis was prepared to show that no common mode failure exists and that single failure criterion has been satisfied. Additional analysis of fuse/circuit breaker coordination will be performed to demonstrate adequate fuse coordination or provide an analysis of the acceptability of the current circuit protection.

Example 7 - The impact of single normal service water pump (NSW) operation on SSW initiation was not analyzed. Under this condition the low-system pressure initiation signal to start SSW may not actuate and less than design flow rates would be supplied to safety-related heat exchangers. An analysis has been performed to show that low normal service water pressure will cause the standby service water system to initiate.

Example 8 - The potential of the EDG air start system receiver pressure dropping to a level that was just above the Technical Specification limit and possibly preventing an automatic start had not been analyzed. An alarm is available at a higher pressure to alert the operators to low system pressure. The following options are being considered to resolve this item:

- a) Lower the EDG low starting air receiver tank pressure lockout setpoint to provide additional margin.
- b) Request a Technical Specification change to raise the minimum air start system receiver pressure.

Example 9 - Stress due to water hammer of piping during simultaneous starting of two standby service water pumps (Divisions I & III) had not been analyzed. System venting capability is adequate for a two pump trip. An analysis is being performed to verify the venting is adequate for a two pump start.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Continued review and refinement of the River Bend design basis is adequately maintained by internal QA audits and the existing design control program. Resolution of the specific calculation shortcomings mentioned in the violation will be accomplished by March 31, 1991. The calculation procedure will be revised to include these shortcomings as examples by February 15, 1991.