GULF STATES UTILITIES COMPANY
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May 19, 1988
RBG-27871
File Nos. G9.5, G15.4.1

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

Gentlemen:

**RIVER BEND STATION - UNIT 1**
**REFER TO: REGION IV**
**DOCKET NO. 50-458/REPORT 87-21**

This letter responds to the Notice of Violation contained in NRC Inspection Report No. 50-458/87-21. The inspection was performed by Mr. Johnson et al. during the period of November 2-6, 1987 of activities authorized by NRC Operating License NPF-47 for River Bend Station Unit 1.

Gulf States Utilities Company's (GSU) responses to Notices of Violation 8721-01, "Failure to Adequately Support Qualification of Splices in Valve Operators," 8721-02, "Failure to Adequately Support Qualification of 300-Volt Instrument Cable," 8721-03, "Failure to Adequately Support Qualification of Conax ECSA," and 8721-04, "Failure to Adequately Support Qualification of MOV Terminal Blocks," are provided in the enclosed attachments pursuant to 10CFR2.201. This completes GSU's responses to these items.

Sincerely,

J. E. Booker

J. E. Booker
Manager-River Bend Oversight
River Bend Nuclear Group

JEB/LAE/JRH/JWC/ch

cc: U. S. Nuclear Regulatory Commission
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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| STATE OF TEXAS | ¶ | |
| | ¶ | |
| COUNTY OF JEFFERSON | ¶ | |
| | ¶ | |
| In the Matter of | ¶ | Docket No. 50-458 |
| | ¶ | |
| GULF STATES UTILITIES COMPANY | ¶ | |
| | ¶ | |
| (River Bend Station Unit 1) | | |

AFFIDAVIT

J. E. Booker, being duly sworn, states that the is Manager-River Bend 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; that he has read all of the statements contained in such documents attached thereto and made a part thereof; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.

J. E. Booker

Subscribed and sworn to before me, a Notary Public in and for the State and County above named, this 9 day of May, 1988.

Martha C. Hobdy
Notary Public in and for
Jefferson County, Texas

My Commission Expires:
1-11-90

Attachment 1

Response to Notice of Violation 50-458/8721-01

Level IV

REFERENCE:

Letter from J. E. Booker to Nuclear Regulatory Commission, dated December 28, 1987.

Notice of Violation - Letter from L. J. Callan to J. C. Deddens, dated April 19, 1988.

FAILURE TO ADEQUATELY SUPPORT QUALIFICATION OF SPLICES IN VALVE OPERATORS:

Paragraph (f) of 10CFR50.49 requires that qualification of each component must be based on testing or experience with identical equipment, or with similar equipment with a supporting analysis, to show that the equipment to be qualified is acceptable.

Paragraph (k) of 10CFR50.49 states that equipment previously required by the Commission to be qualified to NUREG-0588 (For Comment version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," need not be requalified.

Paragraph 5(1) of NUREC-0588 states that the qualification documentation shall verify that each type of electrical equipment is qualified for its application and meets its specified performance requirements. The basis of qualification shall be explained to show the relationship of all facets of proof needed to support adequacy of the complete equipment. Data used to demonstrate the qualification of the equipment shall be pertinent to the application and organized in an auditable form.

Contrary to paragraphs (f) and (k) of 10CFR50.49, and Section 5(1) of NUREG-0588, Category I, EQ Job Book (EQJB) 211.161 in the equipment qualification file (EQF) for T95 and 35 tape splices, used in Limitorque SMB/SB motor operators inside and outside containment, did not adequately support qualification (1) in that similarity between the tested in-line splice and the installed V-shape splice configurations was not established; and (2) the insulation resistance data taken during the in-line splice type test were not available in the EQF and consequently not reviewed for impact with regards to specified functional performance requirements of control circuits at RBS.

REASON FOR VIOLATION:

During the evaluation of the qualification report (SDDF No. 6211.161-997-009A), it apparently was assumed by Stone & Webster Engineering Corporation (SWEC) that Okonite Drawing No. D-11486, Rev. 4,

dated March 1, 1979, demonstrated similarity of the V-splice to the 90° bolted lug splice identified as "Bolted Style Apparatus Lug". Furthermore, during construction at RBS, discussions held between Okonite and SWEC indicated that the V-splice was adequately represented by the tested configuration and therefore, the V-splice configuration was added to Specification 248.000, the electrical installation specification.

Insulation resistance (IR) data was taken at various times during the qualification test program as described on page 7 of the test report. The test report did not include IR data taken during the LOCA test sequence. The IR data in the test report was evaluated for functional performance requirements as documented in the Category I Nonengineered Items Qualification Evaluation Sheet (pages 13 and 14 of the Qualification Program Results Checklist). The technical performance evaluation for electrical characteristics states, "All post-LOCA values were acceptable - see NGRN, page 7 for exact values." The checklist is part of the EQJB, was contained within the EQJB during the NRC inspection, and is dated November 31, 1981.

Further review for IR data taken during the LOCA test was not performed because IEEE Standard 383-1974, "IEEE Standard for Type Test of Class IE Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations" and US NRC Regulatory Guide 1.131, "Qualification Tests of Electric Cables, Field Splices, and Connections for Light-Water-Cooled Nuclear Power Plants", do not contain requirements for IR measurements during LOCA testing, but rather require operation under rated voltage and load, which was performed during the LOCA test. The test report does indicate acceptable performance during the LOCA simulation. GSU believes these do not constitute safety or technical concerns.

CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND RESULTS ACHIEVED:

Upon identification of the lack of a specific similarity analysis for the V-splice, GSU immediately performed and documented the analysis requested by the NRC inspectors. The similarity analysis was added to the EQJB during the inspection period. The similarity analysis documents the acceptability of the V-splice, consisting of Okonite T-95 and No. 35 tape with bolted compression-type ring lugs oriented between 45° and 90° as required by Specification 248.000, Appendix J, as compared to the tested configuration consisting of Okonite T-95 and No. 35 tape over an in-line splice made with compression-type butt splices.

The insulation resistance values measured by the equipment manufacturer and requested by the NRC inspectors were obtained during the inspection and were evaluated to assure that the reported values enveloped RBS conditions.

Engineering Department Procedure (EDP)-EQ-02, "Preparation, Review, Approval and Revision of Equipment Qualification Review Checklist," was issued on February 4, 1988. The procedure and checklist provide specific questions regarding functional performance requirements and

similarity of tested- to installed- conditions. All EQJBs are being reviewed against the checklist and the completed checklist has been included in the EQJB.

Okonite Report NGRN-3 was in the Equipment Qualification File under EQJB 211.161 at the time of the NRC inspection. A specific reference to EQJB 211.161 is being added to the System Component Evaluation Worksheets (SCEW) for Limitorque motor operators to the splice qualification documentation. CMP-1277, "Low, Medium and High Voltage Power Cable and Splicing and Terminations," is a controlled plant maintenance procedure, and as such, controlled copies are maintained in the engineering department library for use by the EQ engineers. Controlled copies of plant procedures are not included in the EQJBs.

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

As described in paragraph 2.3, EDP-EQ-02 was issued on 2/4/88, and will be used to review a total of 53 EQJBs to assure that similarity and functional performance attributes of equipment qualification programs are adequately addressed in the RBS EQ files.

GSU has provided commitments to NRC via referenced letter dated December 28, 1987 to respond to the NRC's concern with auditability of the RBS EQJBs.

## DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Review of the EQJBs in accordance with EDP-EQ-02 has been completed and the checklist provided with the procedure incorporated into each job book.

Incorporation of the required references for documentation of functional performance requirements, and further demonstration of similarity of tested- to installed- equipment will be completed by June 30, 1988 for the EQJBs not reviewed by the NRC.

**Attachment 2**

**Response to Notice of Violation 50-458/8721-02**

**Level IV**

REFERENCE:

Letter from J. E. Booker to Nuclear Regulatory Commission, dated December 28, 1987.

Notice of Violation - Letter from L. J. Callan to J. C. Deddens, dated April 19, 1988.

FAILURE TO ADEQUATELY SUPPORT QUALIFICATION OF 300-VOLT INSTRUMENT CABLE:

Paragraph (f) of 10CFR50.49 requires that qualification of each component must be based on testing or experience with identical equipment, or with similar equipment with a supporting analysis, to show that the equipment to be qualified is acceptable.

Paragraph (k) of 10CFR50.49 states that equipment previously required by the Commission to be qualified to NUREG-0588 (For Comment version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," need not be requalified.

Paragraph 5(1) of NUREG-0588 states that the qualification documentation shall verify that each type of electrical equipment is qualified for its application and meets its specified performance requirements. The basis of qualification shall be explained to show the relationship of all facets of proof needed to support adequacy of the complete equipment. Data used to demonstrate the qualification of the equipment shall be pertinent to the application and organized in an auditable form.

Contrary to paragraphs (f) and (k) of 10CFR50.49, and Section 5(1) of NUREG-0588, Category I, EQJB 241.242 in the EQF for Rockbestos Firewall III 300-volt instrument cable, did not adequately support qualification (1) in that similarity between the tested irradiation cross-linked insulation cable and the cable installed at RBS was not established (originally chemically cross-linked insulation cables were ordered at RBS and no information was available in the EQF to clarify what was installed); and (2) in that no functional performance requirements on instrumentation circuits were performed and documented in the EQF in consideration of cable insulation resistances. The EQF did not verify that these cable types had been evaluated to meet the necessary functional performance requirements specified.

**REASON FOR THE VIOLATION:**

The similarity of the tested cable to the cable installed at RBS was established under SDDF 6241.242-158-012B, which was included in the EQJB at the time of the NRC inspection. Specifically, the SDDF includes a letter from the Rockbestos Company to SWEC, dated October 18, 1985 which provides a listing of cable procured under specification 241.242, by mark number, as compared to a test specimen from Rockbestos test reports QR5804, and QR5805. The letter does not specifically identify whether the cross-linked polyethylene was manufactured with an irradiation or chemical cross-linking process.

Functional performance requirements for the cable were reviewed as evidenced by the equipment qualification checklists contained in the EQJB. Calculations documenting the acceptability of the insulation resistance measurements made during the LOCA testing were performed prior to the NRC inspection and were included in the EQJB in October 1987. An analysis to evaluate the insulation resistance readings taken during the LOCA portion of the qualification test was performed and transmitted to GSU from SWEC via letters RBS-10926, dated October 16, 1987, and RBS-10930, dated October 28, 1987. The analysis was added to the EQJB upon receipt during October. No safety or technical concerns were identified.

**CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND RESULTS ACHIEVED:**

Similarity of the tested Rockbestos cable to the Rockbestos cable installed at RBS was further demonstrated by a letter received from Rockbestos Corporation dated November 13, 1987 which stated that all cable received at RBS under Specification 241.242 was insulated with KXL 760G irradiation cross-linked polyethylene. This letter has been added to the EQJB.

The analysis provided by SWEC to evaluate the insulation resistance of the cable during LOCA testing has been added to the EQJB as described above.

**CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS:**

EDP-EQ-02, discussed in response to Violation 458/8721-01, will assure that the similarity and functional performance requirements of future purchased items will be addressed in the EQJBs.

**DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED:**

The letter from Rockbestos Company indicating that RBS used only irradiation cross-linked polyethylene cable and the analysis of potential leakage currents during a LOCA were incorporated into the EQJB during the NRC inspection period.

Attachment 3

Response to Notice of Violation 50-458/8721-03

Level IV

REFERENCE:

Letter from J. E. Booker to Nuclear Regulatory Commission, dated December 28, 1987.

Notice of Violation - Letter from L. J. Callan to J. C. Deddens, dated April 19, 1988.

FAILURE TO ADEQUATELY SUPPORT QUALIFICATION OF CONAX ECSA:

Paragraph (f) of 10CFR50.49 requires that qualification of each component must be based on testing or experience with identical equipment, or with similar equipment with a supporting analysis, to show that the equipment to be qualified is acceptable.

Paragraph (k) of 10CFR50.49 states that equipment previously required by the Commission to be qualified to NUREG-0588 (For Comment version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," need not be requalified.

Paragraph 5(1) of NUREG-0588 states that the qualification documentation shall verify that each type of electrical equipment is qualified for its application and meets its specified performance requirements. The basis of qualification shall be explained to show the relationship of all facets of proof needed to support adequacy of the complete equipment. Data used to demonstrate the qualification of the equipment shall be pertinent to the application and organized in an auditable form.

Contrary to paragraphs (f) and (k) of 10CFR50.49, and Section 5(1) of NUREG-0588, Category I, EQJB 211.161 in the EQF for Conax electrical conductor seal assembly (ECSA), did not adequately support qualification in that similarity between the tested ECSA and those installed was not established at RBS. The test profile, contained in the EQF, did not envelope the 100-day postaccident operating time. The EQF did not verify that the installed ECSAs had been evaluated to meet the necessary functional performance requirements specified.

REASON FOR THE VIOLATION:

The similarity between the tested electrical conductor seal assembly (ECSA) and those installed at RBS was established prior to the November 30, 1985 deadline required by 10CFR50.49. Nonengineered Item Data Sheet 1136A, Specification 211.161, line number 152.8 states, "Documentation Required: Certificate of Conformance that the materials described in the purchase order, and supplied by the vendor, are identical to those tested under the following reports:

1. IPS-409, Revision A (RBS SDDF 6211.161-997-046A)
2. IPS-409.1 (RBS SDDF 6211.161-997-046A)
3. IPS-1079 (RBS SDDF 6211.161-997-046A)
4. IPS-1055 (RBS SDDF 6211.161-997-046A)
5. IPS-1184 (RBS SDDF 6211.161-997-045A)"

IPS-1184, Section 4.1 states, "The ECSA Test Specimen Assembly shown in Conax Drawing N-20015 (Ref 2.5, Appendix C) is identical to actual production ECSAs." In addition, the Certificate of Conformance supplied to the NRC Inspector during the inspection provided the information required by the specification and identified reports listed above as applicable to the supplied devices.

Similarity between the tested and installed configuration was also demonstrated. IPS-1184, Section 4.2 states, "The four (4) ECSA inboard end connectors were spliced together in pairs using standard RayChem WCSF-N heat shrink tubing and procedures...". RBS drawing no. 12210-EE-450BB shows the use of RayChem WCSF-N for installation of ECSAs through reference to the manufacturer's installation instructions.

With the exception of the Certificate of Conformance, all documentation discussed above was included in the EQJB.

The test profile contained within IPS-1184 (SDDF 6211.161-997-045A) was used as the basis for calculation 12210-EQS-53 dated May 20, 1985 which established a 100 day postaccident operability period for equipment located outside the containment. For equipment located within the containment and required to be operable during a LOCA, the tested profile was approximately 5°F lower than the RBS profile from t=30 minutes until t=3 hours. The test report was accepted on the basis that the test profile provides up to 40°F margin during the initial transient and from 10°F from t=3 hours to approximately 140°F margin at 15 days of the simulation.

Upon identification of the NRC Inspectors concern with the test profile, calculation G13.18.15.1*35 was performed to demonstrate the adequacy of the test profile as compared to RBS specific conditions. The calculation used an activation energy of 3.916 eV which had been provided by Conax and contained within the EQJB. The activation energy is based upon testing contained in Conax IPS-325 (contained within the EQJB) and uses the methods described in IEEE Standard 101-1972, "Guide for Statistical Analysis of Thermal Life Test Data". The IEEE standard is the industry standard for development of activation energy values for nonmetallic materials. Therefore, use of the activation energy provided by Conax with the basis adequately documented is justified.

The EQJB demonstrated that the installed ECSAs had been evaluated for the specific performance requirements at RBS. Specification 211.161, Data Sheet 1136A, line 151.36 states that post-LOCA leakage current shall not exceed 0.02 mAdc. Section 6.7.4.2.1 of Conax IPS-1184 states, "Recorded leakage currents never exceeded the diminutive value of 0.02 mAdc over the test duration." The review checklist indicated that the functional performance requirements demonstrated by IPS-1184 were acceptable. This information was in the EQJB prior to the November 30,

1985 deadline provided in 10CFR50.49. No technical or safety concerns were identified.

CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND RESULTS ACHIEVED:

Upon identification of the discrepancy between the tested and specified LOCA profiles, an immediate evaluation was performed, documented in RBS calculation no. G13.18.15.1*35, and added to the EQJB.

CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS:

EDP-EQ-02, "Preparation, Review, Approval and Revision of Equipment Qualification Review Checklist," was issued on February 4, 1988. The procedure gives guidance on review and documentation of equipment qualification test results as compared to specific RBS conditions.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Calculation G13.18.15.1*35 was completed and added to the EQJB on November 18, 1987.

EDP-EQ-02 was issued on February 4, 1988.

**Attachment 4**

**Response to Notice of Violation 50-458/8721-04**

**Level IV**

**REFERENCE:**

Letter from J. E. Booker to Nuclear Regulatory Commission, dated December 28, 1987.

Notice of Violation - Letter from L. J. Callan to J. C. Deddens, dated April 19, 1988.

**FAILURE TO ADEQUATELY SUPPORT QUALIFICATION OF MOV TERMINAL BLOCKS:**

Paragraph (f) of 10CFR50.49 requires that qualification of each component must be based on testing or experience with identical equipment, or with similar equipment with a supporting analysis, to show that the equipment to be qualified is acceptable.

Paragraph (k) of 10CFR50.49 states that equipment previously required by the Commission to be qualified to NUREG-0588 (For Comment version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," need not be requalified.

Paragraph 5(1) of NUREG-0588 states that the qualification documentation shall verify that each type of electrical equipment is qualified for its application and meets its specified performance requirements. The basis of qualification shall be explained to show the relationship of all facets of proof needed to support adequacy of the complete equipment. Data used to demonstrate the qualification of the equipment shall be pertinent to the application and organized in an auditable form.

Contrary to paragraphs (f) and (k) of 10CFR50.49, and Section 5(1) of NUREG-0588, Category I, EQJB BOP-Limitorque and EQJB SRN S03 for Limitorque motor operators, did not adequately support qualification (1) in that the terminal block (TB) types used within the operators were not identified in the documentation file; (2) no methodology to establish qualification of these TBs were in the documentation file; and (3) a similarity analysis, to demonstrate qualification of TBs used in operators represented by the EQJB SRN S03 file, was not available.

**REASON FOR THE VIOLATION:**

The TBs used within Limitorque operators were not identified in the EQJB at the time of the NRC inspection. Maintenance work order (MWO) R103851, dated February 3, 1987 was in the process of being completed during RBS refueling outage 1 (during the NRC inspection). MWO R103851 was written in response to a concern with qualification of TBs in Limitorque operators. The MWO required that a 100% walkdown of all

Limitorque operators be performed during RF1 to identify the make and model number of all TBs. The traceability to existing qualification documentation was to be performed upon completion of the walkdown inspection.

The qualification documentation for TBs within the Limitorque operators could not be referenced on the SCEWs until the TB had been specifically identified. RBS had previously obtained Limitorque test report B0119, which provided documentation of testing performed on the various TBs included in the manufacture of Limitorque operators. During the course of the inspection, the NRC inspector stated that the NRC's position on B0119 was that the testing only demonstrated the adequacy of one type of TB described in the test report. The NRC position was based upon a draft Information Notice which was not made available to GSU. As a result, GSU obtained Corporate Consulting Limited Report No. A-686-85 (SDDF 6211.161-997-139A and 138A), performed the necessary similarity and functional performance analyses, and added the documentation to the EQJB (SDDF 6228.212-047-110B) during the inspection period. The test report was subsequently reviewed during the inspection and found to be acceptable.

References on the SCEW sheets to the appropriate qualification documentation for the as found TBs could not be completed prior to the completion of the walkdown. The walkdown was completed on November 15, 1987, and revision control forms were prepared to list the TB qualification on the SCEW sheets. With regard to specific TBs inspected, as discussed during a telephone exit meeting on December 2, 1987, the Buchannan TBs contained within valves 1E22*MOVF004, and 1DFR*MOV146 were replaced with qualified splices. Even though the physical attributes of the TBs identified them as one of the Buchannan model numbers qualified for service at RBS, the TBs were replaced with splices because no specific model number identification was visible on the TB. The walkdown sheet for 1E22*MOVF001 indicates that as of October 5, 1987, this valve contained a tape splice. Furthermore, following the NRC walkdown, GSU was requested to provide the documentation that controlled installation of the splice for valve 1E22*MOVF001. 1SWP*MOV507B was determined to contain a Marathon 300 TB during the Limitorque walkdown. These examples do not represent technical or safety concerns.

CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND RESULTS ACHIEVED:

Upon completion of the activities required under MWO R103851, the TBs used in each Limitorque operator have been identified, the associated qualification documentation identified, and the specific reference added to the SCEW sheet.

CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS:

EDP-EQ-02, "Preparation, Review, Approval and Revision of Equipment Qualification Review Checklist," was issued on February 4, 1988. The procedure provides guidance on review and documentation of equipment qualification test results as compared to specific RBS conditions.

**DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED:**

The SCEW sheets for Limitorque operators have been updated to include identification of the TBs by manufacturer and model number, reference to the appropriate qualification file, and identification of the reduced voltage calculation performed for each Class 1E Limitorque operator used at RBS. Updated SCEW sheets will be placed in the EQJBs by June 30, 1988.