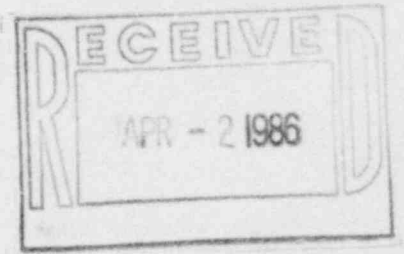


# The Light company

Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

March 31, 1986  
ST-HL-AE-1632  
File No.: G12.300

Mr. Robert D. Martin  
Regional Administrator, Region IV  
U. S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011



South Texas Project  
Units 1 & 2  
Docket Nos. STN 50-498, STN 50-499  
Final Report Concerning  
Circuit Breakers in Class 1E 480 Volt Motor Control Centers

Dear Mr. Martin:

On November 18, 1985 Houston Lighting & Power Company notified your office, pursuant to 10CFR50.55(e), of an item concerning circuit breakers in Class 1E 480 volt motor control centers utilized at the South Texas Project. Enclosed is our Final Report on this item. We have completed our investigation of this deficiency and found it to be "reportable" pursuant to 10CFR50.55(e).

If you should have any questions on this matter, please contact Mr. C. A. Ayala at (512) 972-8628.

Very truly yours,

A handwritten signature in cursive script that reads "J. H. Goldberg".

J. H. Goldberg  
Group Vice President, Nuclear

RCM/yd

Attachment: Final Report Concerning  
Circuit Breakers in Class 1E 480 Volt  
Motor Control Centers

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Revised 12/2/85

South Texas Project  
Units 1 & 2  
Docket Nos. STN 50-498, STN 50-499  
Final Report Concerning  
Circuit Breakers in Class 1E 480 Volt Motor Control Centers

I. Summary

On November 18, 1985 Houston Lighting & Power Company (HL&P) notified your office, pursuant to 10CFR50.55(e), of an item concerning terminal bus bar extensions on circuit breakers in Class 1E 480 volt motor control centers (MCCs). During an NRC Construction Appraisal Team (CAT) inspection, it was noted that some of the circuit breakers had terminal bus bar extensions which were loose and had electrical insulation barriers between the bus bar extensions which were either loose or missing.

As a result of the above, Unit 1 and 2 Class 1E 480 volt MCCs were inspected. Corrective action and recurrence control items have been completed for Units 1 and 2.

If these deficiencies had remained uncorrected, the ability of the plant to mitigate the consequences of a design basis accident (DBA) could have been affected. Therefore, we have found this deficiency to be "reportable" pursuant to 10CFR50.55(e).

II. Description of Deficiency

Telemecanique, Inc. (formerly Gould/ITE) has furnished 24 (12 per unit) safety-related 480 volt motor control centers (MCCs). These 24 MCCs have approximately 350 (175 per unit) cubicles with circuit breakers. Sixty ITE type HE molded case circuit breakers were identified for Units 1 and 2 in which terminal bus bar extensions were provided by the vendor to the load side of the breakers. Loose connections were discovered at some of the bus bar extensions. The vendor-installed screws connecting the bus bar extensions to the circuit breakers lack sufficient thread engagement to make and maintain tight connections. The screws in question are 1/4" diameter by 1/2" long pan head screws installed with lock washers. These screws were furnished with the circuit breaker for load side cable connections. However, the 1/4" thick copper bus extensions which were added by the vendor to accommodate larger cable lugs, reduce the available length of screw thread.

The terminal bus bar extensions were provided whenever the MCC layout drawings indicated that cables larger than #2 AWG were to be terminated at the breaker. These extensions were added because the cable lugs for the larger cables were expected to be too large to fit into space provided on the breaker. No specific authorization for the extensions was supplied by Bechtel nor requested by the vendor.

Vendor installed plastic barriers between the bus extensions were found to be loose, and in some cases, missing. The barriers are press fit and/or glued into slots located on the bottom of the circuit breaker and maintain electrical insulation between adjacent bus bar extensions. Some of the barriers had fallen into the bottom of the cubicles.

The root cause of the extension/barrier deficiency was a failure of the vendor to follow established design and manufacturing procedures.

### III. Corrective Action

The following corrective actions have been implemented for Units 1 and 2:

In 58 of the 60 cases, the size of the load cables allow lug connection directly to the circuit breaker. The bus bar extensions have been removed and the load cables will be connected directly to the circuit breaker load terminals. This eliminates the need for the extensions and the barriers.

The remaining two breakers were reworked by utilizing longer screws which assure sufficient thread engagement for the bus extensions. In addition, all three phases of the circuit breaker extension were insulated with heat shrink tubing, eliminating the need for the barriers.

### IV. Recurrence Control

This deficiency was caused by the vendor's failure to follow established design and manufacturing procedures. The specification for motor control centers will be revised to require engineering approval of the use of modified connectors, terminal boards, or bus pads where the standard size connectors will not accept the cable size to be used at STP. The revision will be completed by April 30, 1986.

An inspection of a sample of similar circuit breakers supplied by other manufacturers was conducted, but no similar deficiencies were found.

V. Safety Analysis

During or after a postulated seismic event, the potential exists that these circuit breakers could have experienced a phase-to-phase fault or loose connection which may have resulted in misoperation or failure of these circuits.

If this deficiency had remained uncorrected, the ability of the plant to mitigate the consequences of a design basis accident (DBA) could have been affected. Therefore, we have found this deficiency to be "reportable" pursuant to 10CFR50.55(e).