

# Brown & Root, Inc.

A Halliburton Company

William M. Rice

Group Vice President

Power Group

July 17, 1981

(713) 676-3521



Mr. Victor Stello, Director  
Office of Inspection and Enforcement  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Mr. Stello:

Based on an extensive testing program conducted at the South Texas Project (STP) to verify the ultimate capacities of wedge-type expansion anchors, a concern was identified that these anchors may not develop ultimate capacities consistent with the manufacturer's published values when installed in grout. This concern was presented to the Nuclear Regulatory Commission (NRC) in our letter of June 1, 1981, submitted pursuant to 10CFR21. The expansion anchors involved are supplied by Hilti Industries, Inc. of Tulsa, Oklahoma.

Preliminary analysis of test data for expansion anchors in grout indicates that ultimate tensile capacities for these anchors should be reduced by approximately 20% from the capacity of the anchors when installed in concrete. Shear values in grout are more consistent with those published by the manufacturer than are the tensile values. Some tested expansion anchors did experience shear failure at load values slightly lower than those in the manufacturer's tables. The test data indicate that a deeper embedment in grout may provide the capacity of a lesser embedment in concrete. Further analysis is required to establish a more definitive relationship between grout versus concrete installation.

Details regarding test results for anchor bolts installed in concrete are contained in Houston Lighting & Power Company's letter of June 10, 1981, ST-HL-AE-682, submitted to your Region IV office pursuant to 10CFR50.55(e).

To date, Brown & Root, Inc. has not identified a safety hazard at STP relative to expansion anchor bolt installation in grout. As previously stated, due to the complexity of the concern, additional study of the test results and evaluation of specific application are required. This effort will extend beyond the near term. We shall provide the status of our activities by September 4, 1981.

Yours very truly,

BROWN & ROOT, INC.

*W. M. Rice* *W. M. Rice*

W. M. Rice

Group Vice President

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