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RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards Revision 2 to 800429 steam generator insp & safety evaluation rept.Revision provides more accurate eddy current test data results & chronological classification of tube degradation.Conclusion not altered by revision.

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Office of Nuclear Reactor Regulation
Mr. Darrell G. Eisenhut, Director
Division of Licensing
United States Nuclear Regulatory Commission
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
STEAM GENERATOR INSPECTION AND SAFETY EVALUATION REPORT - REVISION NO. 2

Dear Mr. Eisenhut:

Enclosed please find Revision No. 2 to the Steam Generator Inspection and Safety Evaluation Report transmitted to you on April 29, 1980. This revision affects the original Safety Evaluation Report which appeared as Attachment 2 and is provided to more accurately describe the eddy current test data results and the chronological classification of the tube degradation. This revision also corrects a typographical error in the plugging criteria applied to the U-bend region of the B and C Steam Generators.

The enclosure is a complete, revised Safety Evaluation Report and therefore should replace Attachment 2 of the April 29 report in its entirety.

This revision serves to provide clarification only and in no way alters the basis or the conclusion of the safety evaluation.

If you have any questions, please contact our staff.

Yours very truly,

M a M. Dorsi

for E. E. Utley
Executive Vice President
Power Supply and
Engineering & Construction

JHE/EVP/dk
Enclosure

cc: Messrs. J. D. Neighbors (NRC)
J. P. O'Reilly (NRC-I&E)

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ATTACHMENT 2

SAFETY EVALUATION REPORT FOR H. B. ROBINSON PLANT

H. B. Robinson Unit No. 2, during the recent steam generator inspection, discovered ECT indications in the tubesheet crevice, above the top of the tubesheet, at the tube support plates and in the "U" bends. A comparison of these indications with previous ECT inspection results indicated the following:

1. A number of these indications have grown to detectable size since the last steam generator inspection (based on comparison of 400 K Hz signal alone).

2. Some of these indications could have been present but could not be detected without multifrequency ECT equipment and techniques.

3. Some of these indications were present but could not be resolved without multifrequency ECT equipment and techniques.

4. A large number of these indications cannot be conclusively classified as to period of occurrence due to the lack of inspection data.

The discovery of the indications caused an expansion of the inspection sample to 100% in all generators. The ECT inspection was done in two patterns. The peripheral tubes were inspected through the "U" bend. The central region tubes were inspected to above the second tube support plate. This inspection resulted in 124 tubes requiring plugging based on the 47% ECT signal plugging criteria.

The integrity has been evaluated for the various load conditions imposed for these steam generators. The minimum tube wall that is required to maintain pressure boundary integrity under faulted condition loads is .013 inches of tube wall in the straight section of the tube and .021 inches of tube wall in the "U" bend region. This corresponds to 26% and 42% of the nominal .050 inch for the straight tube and the "U" bend, respectively.

The ECT data for the degradation which took place during the most recent operating period can be used to establish a maximum rate of degradation. Each form and location of degradation establishes its own unique rate of degradation. This individual degradation rate is affected by the specific steam generator conditions and material characteristics at each location in the tubes with indications that are still in service. The last operation period for steam generator A was 256 days. If a plugging criteria of 36% in the "U" bends is applied, this means that the largest "U" bend indication still in service is a 35% indication. This allows a degradation rate to be established. A 35% indication occurring in 256 days yields a degradation rate of .14% per day. The difference between the 35% indication and the plugging criteria of 42% remaining wall is 23% wall available for the degradation to continue before the minimum wall in the "U" bend for faulted conditions is violated. An operating time of 164 days is calculated using the degradation rate of .14%/day and 23% available wall (NOTE: 19 days have already been used).

If the same criteria is applied to the straight section of tubing for steam generator A with a 47% plugging criteria and a 26% minimum wall, a degradation rate of .18%/day is established. This allows an operating period of 155 days.

The evaluation for steam generators B and C was based on an operating period of 275 days prior to this inspection. A plugging criteria of 39% for the B and C steam generators is applied to the "U" bend region. This will indicate a degradation rate of .14%/day. An operating period of 142 days is available before the minimum tube wall in the "U" bend is violated. This criteria for the straight section of tubing in steam generators B and C

yields a degradation rate of .17%/day and an operating period of 164 days before the minimum tube wall is violated for the straight section.

This evaluation shows that the minimum operating time for any generator in either the straight or "U" bend section of the tubing is 142 days before the minimum tube wall for faulted conditions is violated. This is based on the plugging criteria of 36% in steam generator A "U" bends, 39% in steam generator B and C "U" bends, 47% in the straight sections for all three generators. The degradation rates are based on the previous operating periods of 256 days for steam generator A and 275 days for steam generators B and C.