

INTERIM REPORT

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This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

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INTERIM REPORT

NRC Research and Technical
Assistance Report

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November 14, 1979

Dr. Joe Muscara
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Nuclear Regulatory Commission
Mail Stop 1130-SS
Washington, D.C. 20555

Dear Joe:

MONTHLY LETTER REPORT - OCTOBER, 1979
ACOUSTIC EMISSION CHARACTERIZATION OF FLAW GROWTH
IN A533B PRESSURE VESSEL STEEL - FIN. NO. B2088

ACCOMPLISHMENTS

- Continued heavy section cylindrical bend specimen test.
- Performed analysis of initial data from cylindrical bend specimen.
- Further investigation of available vessel test facility for simulated service testing.
- Completed material for November review meeting.

Testing of the 3" wall, cylindrical bend specimen shown in Figure 1 continued. A total of 105,000 cycles at 0.5Hz and R=0.1 had been completed by the end of October. Ultrasonic inspection indicated that the flaw had grown about one-fourth inch. Digitized signal wave forms (AE and noise) are being recorded from three sensors--a commercial, high temperature surface mount sensor, a wave guide sensor welded to the specimen surface, and a room temperature surface mount sensor used in previous laboratory specimen tests. These will not only provide pattern recognition data but also provide a means of comparing the response characteristics of the three sensors.

Initial test results are shown in Figure 2. They show that introduction of pressurized high temperature water did not significantly affect AE detection. The AE data shown in Figure 2 includes unpartitioned and peak time partitioned data. The two curves are very similar during fatigue testing in RT air but with introduction of 550°F water, what appears to be abnormal signals

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are included in the validated data. Eliminating these long rise time signals produces a data curve at 550°F which is consistent with the room temperature data. The source of the abnormal appearing signals is not clear; however, it has been established that they are a function of increasing temperature. Just adding water without high temperature does not significantly affect the data.

The search for a suitable vessel test arrangement to fulfill program needs in FY-80 continued. Discussions with HSST program staff at ORNL has opened the possibility of repairing an HSST vessel (V-7B) and either testing it at ORNL or PNL. Both options are being evaluated to determine costs.

Program review material was prepared for the Seventh Water Reactor Safety Research Information Meeting.

WORK PLANS FOR NOVEMBER

- Continue heavy section cylindrical bend specimen test.
- Continue analysis including pattern recognition for data from the bend specimen test.
- Select a vessel test option for the FY-80 program.
- Initiate preparation of a new Analysis-Before-Test document.
- Participate in the Seventh Water Reactor Safety Research Information Meeting

Yours very truly,

A handwritten signature in cursive script, appearing to read "P. H. Hutton".

P. H. Hutton
Project Manager

PHH:mp

Enclosures

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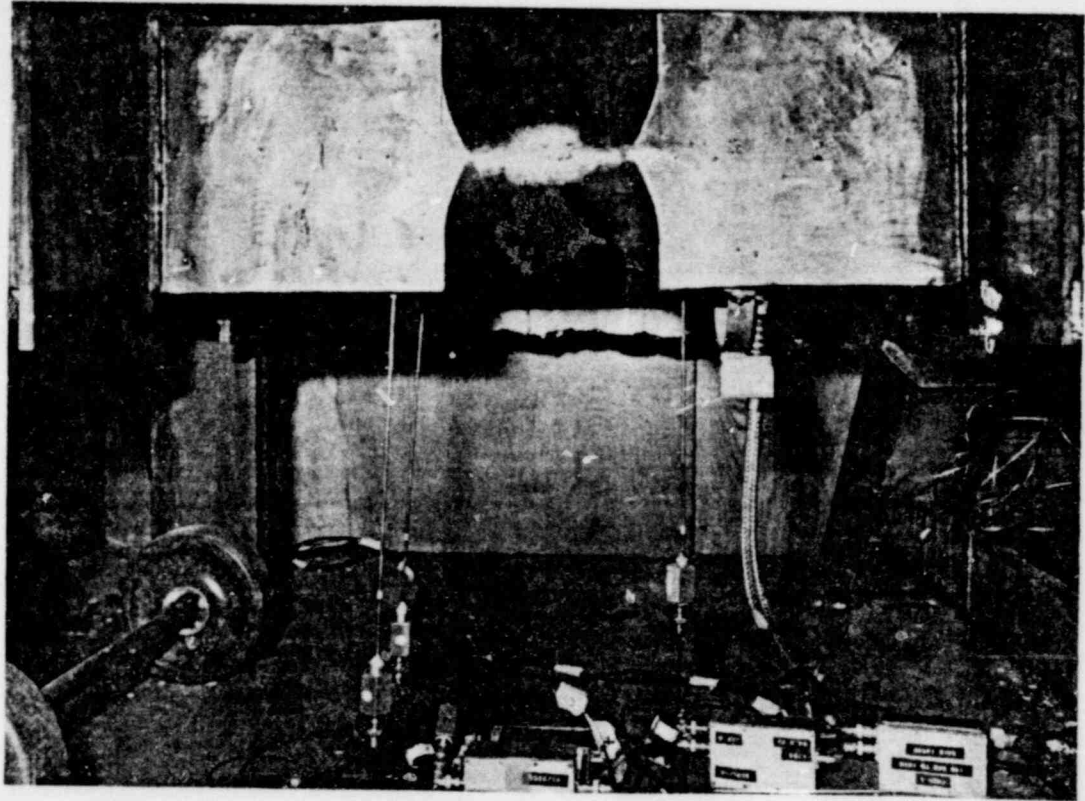


FIGURE 1. Photograph of the Pipe Bend Test Specimen.

POOR ORIGINAL

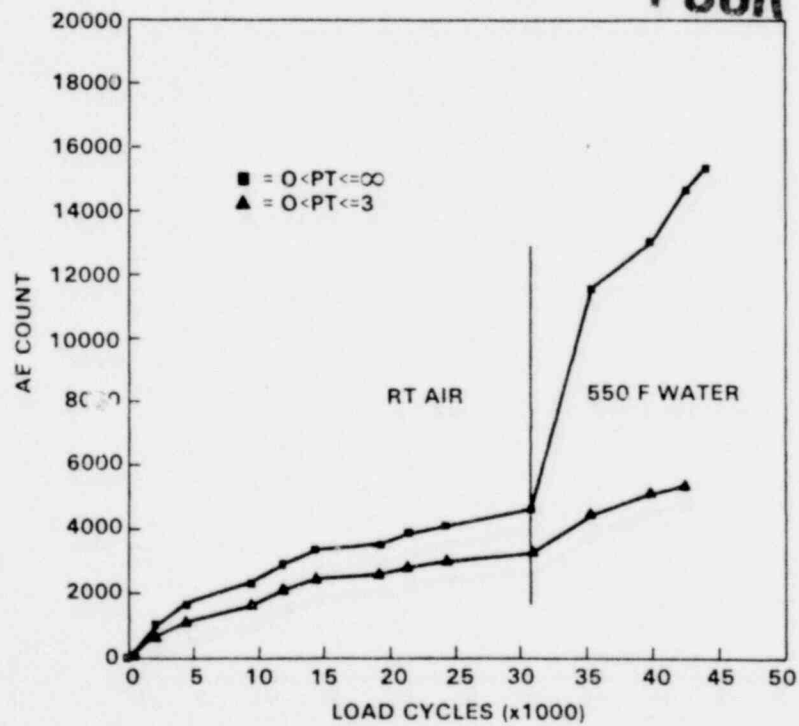


FIGURE 2. Summation AE Count vs. Load Cycles for Fatigue Cycling of a Pipe Specimen.