

INTERIM REPORT

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May 19, 1980

Dr. Joe Muscara
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Dear Joe:

MONTHLY LETTER REPORT - APRIL, 1980
ACOUSTIC EMISSION CHARACTERIZATION OF
FLAW GROWTH IN A533B PRESSURE VESSEL STEEL
FIN. NO. B2088

ACCOMPLISHMENTS

- A test plan for participation vessel tests at MPA, Stuttgart, West Germany has been prepared.
- Continued AE monitor system development.
- Evaluated waveguide data for pattern recognition use.
- Modified cylindrical bend specimen test system to produce simulated reactor flow noise.
- Continued investigation of sites for AE system installation on a reactor.

A test plan has been prepared defining the test format needed in the MPA, Stuttgart vessel tests to achieve the objectives of the AE/Flaw Characterization Program. Arrangements have been made to meet with Dr. Issler, et al, MPA, June 3 and 4. The test plan will be used as a basis for reaching agreement on technical details of the test at that time. Approval of U.S. participation in the MPA vessel tests has been received from the German government.

A "breadboard" AE monitor system for use on the MPA vessel tests has progressed with receipt of a proposal from Dunegan/Endevco to upgrade the existing NRC 1032 AE system and identification of a computer for use in the pattern recognition. Upgrading the NRC-owned D/E 1032 AE system for data acquisition and

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source location appears to be the most attractive of the alternates available. This will provide a system with state-of-the-art commercial system capability at a cost savings of about \$26,000 over purchasing a new system. An existing PDP 11/30 computer has been located for use in processing AE data with a pattern recognition algorithm and recording AE waveforms for further pattern recognition refinement. Interfacing of the D/E 1032 with the analytical sub-systems has been designed.

Data obtained from the cylindrical bend test specimen using broadband waveguide specimens has been evaluated for compatibility with pattern recognition techniques. The results show that the data can be effectively processed to distinguish AE from noise. This is significant in that it offers the alternate of using waveguides instead of much more expensive commercial high temperature surface mount sensors. Present plans are to use waveguides as the primary sensors in the vessel tests with one commercial high temperature sensor for each array to provide pattern recognition backup.

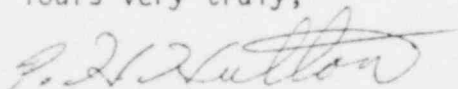
A throttling valve has been added to the cylindrical bend specimen test system near the specimen to produce simulated reactor flow noise. A test format has also been prepared to allow effective completion of the test.

Search for a reactor site to install AE sensing arrays for ultimate testing of program methods on reactor has continued. A meeting has been arranged for late May with Philadelphia Electric Company to consider installing AE sensing arrays on Peachbottom No. 2 reactor.

WORK PLANS FOR MAY

- Travel to Germany to finalize vessel test arrangements.
- Continue AE monitor system fabrication.
- Start the final phase of the cylindrical bend specimen test.
- Attempt to reach firm arrangements for installation of AE sensor arrays on a reactor.

Yours very truly,



P.H. HUTTON
Project Manager

PHH:dd