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SUBJECT: Interim Part 21 rept re weldments on opposed piston & Coltec-Pielstick emergency stand-by diesel gen-set lube-oil & jacket water piping systems.Incomplete penetration caused by inadequate instruction.C/A dependent upon burst test.

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CATEGORY 1 DOCUMENT

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INTERIM LETTER

Supplement No.: 97-002-01

To: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC. 20555

From: Coltec Industries-Fairbanks Morse Engine Division (FMED)

Date: 18 December 1997

Subject: Weldments on Opposed Piston and Coltec-Pielstick Emergency Stand-By Diesel Gen-Set Lube-Oil and Jacket Water Piping Systems

This supplement to the Interim Letter dated 30 September 1997 is intended to inform the U. S. Nuclear Regulatory Commission and the affected nuclear utilities on the status of the root cause investigation and corrective/preventive actions associated with the Coltec-FMED Part 21 File No.: 97-002.

The initial interim letter posed six (6) questions that formed the basis of the root cause investigation.

Question 1: Is the weld design compliant with customer requirements?

Response: Customer contract requirements are currently under review by our After-Market Parts Department. Three (3) general categories apply the affected customers: 1) non specific design/fabrication requirement, thus Coltec-FMED standards apply, 2) ANSI B31.1, and 3) ASME III, Class 3. Coltec-FMED will continue to review customer requirements as part of the ongoing investigation.

Question 2: Are the subject welds compliant with FMED design requirements?

Response: Sections of Lube-Oil and Jacket Water piping were submitted to Coltec-FMED by Florida Power Corp., Baltimore Gas Electric, Virginia Power, and Carolina Power & Light. Of the welds examined to date, most do not have full penetration and therefore do not technically meet the FM welding design requirements. However, several welds examined do have full penetration through some portion of the joint.

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Question 3: If not, do the existing welds posses sufficient strength?

Response: An Engineering procedure is developed and approved; however, weld strength is yet to be determined by testing joints by means of a burst test (pressurizing the piping, including the weld joint, to a high pressure to see if the weld breaks and at what pressure-strength level). Materials and set-up are necessary for this test process; they are currently being gathered and organized.

Question 4: What is the root cause of the identified condition?

Response: The most likely root cause of incomplete penetration is a lack of adequate instruction to the welders or welding operators to assure that proper welds were obtained. This would include instruction on preparation of the weld joint, weld gap requirements, and attention to detail on the part of the welder to see that full penetration was obtained. Moreover, lack of proper instruction to inspectors regarding inspection of the finished welds must also be included as part of the root cause. While some welds may be difficult to inspect directly, there are sufficient methods available that allow welds either to be inspected indirectly, or serially as the piping is assembled

Question 5: What corrective action, if any, should the customer take?

Response: Corrective action by the customer is dependent upon the burst test results (ref. Question 3). If weld joints are generally found un-acceptable, then the customer should replace the affected piping with properly welded pipe.
If; however, the present piping is generally found strong enough as a result of satisfactory burst tests, no further action is required.

Question 6: what preventive action is required by FMED?

Response: Design engineers should be instructed regarding proper design and symbology of welds to best obtain full penetration, including design details on drawings that outline weld joint preparation (taper of inside diameters on standard fittings where weld joints include welding to thin wall mechanical tube, etc).

Welders/weld operators must be instructed regarding requirements for full penetration welding, including operator/welder qualification. Proper weld joint preparation must be emphasized.

Inspectors must be instructed regarding proper methods to ensure welds are properly made to design requirements, including full penetration without excessive weld material on the inside diameter of the pipe.

The above corrective actions should be extended to commercial fabrication as well.

Results from the burst test should be available by the end of January 1998, at which time the review of customer contract requirements should also be complete. A final letter of notification should be available by the end of February 1998.

Sincerely,

Scott A. Fratianne
Sr. Quality Assurance Engineer

Paul Danyluk
Vice President, Engineering

cc: M. Armfield
T. Gill
B. Hall