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IMPROPER MACHINING OF PISTONS IN COLT INDUSTRIES (FAIRBANKS-MORSE) DIESEL-GENERATORS

We recently received information from Northeast Nuclear Energy Company (NNECO), Baltimore Gas and Electric Company (BG&E), and Colt Industries describing a deficiency in the machining of pistons in a Fairbanks-Morse emergency diesel generator, type H7B.

DESCRIPTION OF CIRCUMSTANCES:

NNECO reported that the four capscrews retaining a piston insert in an upper piston of the diesel engine had broken away and were found lying in the engine crankcase. The capscrews were found during a routine field inspection prior to operating the equipment.

NNECO's and Colt Industries' investigations indicated that the cause of the failure was improper machining of the underside of the piston crown. The improper machining left an elevated, ring-shaped surface inside the piston. This prevented the piston and piston insert from mating properly. As a result, during the compression cycle, the resultant space between the surfaces of the two parts allowed the piston crown to flex and be forced down on the insert surface. This subjected the capscrews to an alternating stress, causing their eventual failure.

During the inspection of the remaining pistons, two other pistons were found with the same machining error. However, the capscrews in these pistons had not failed.

BG&E reported that they had found two incorrectly machined pistons. In addition, they found that several locking strips, which are attached to each pair of capscrews, had cracked at the bolt-hole locations.

Colt Industries stated that the probable cause of the failure of the locking strips was an improper torque sequencing of the capscrews during installation.

Colt Industries indicated that they have initiated a program, directed by their service representatives, to inspect all diesel generators in the field that could have these conditions.

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ACTION REQUESTED OF LICENSEES:

1. Notify this office in writing within 20 days whether engines of the make and type described above are used at your nuclear power facilities with an operating license or construction permits.

2. If engines of this make and type are used, your written reply to Item 1. above should include your schedule for examination of the potentially affected engines.

3. Upon completion of any required examinations, provide to this office, in writing within 30 days, the results of the examinations and a description of any repairs found to be necessary.