

General Information or Other (PAR)

Event # 43294

Rep Org: FAIRBANKS MORSE ENGINE	Notification Date / Time: 04/09/2007 20:30 (EDT)
Supplier: FAIRBANKS MORSE ENGINE	Event Date / Time: 04/09/2007 (CDT)
	Last Modification: 04/09/2007
Region: 3	Docket #:
City: BELOIT	Agreement State: Yes
County:	License #:
State: WI	
NRC Notified by: DOMINIC DEDOLPH	Notifications: JAMES TRAPP R1
HQ Ops Officer: MARK ABRAMOVITZ	CHARLES R. OGLE R2
Emergency Class: NON EMERGENCY	SONIA BURGESS R3
10 CFR Section:	THOMAS FARNHOLTZ R4
21.21 UNSPECIFIED PARAGRAPH	TABATABAI (E-MAIL)
	VERN HODGE (E-MAIL)

PART 21 NOTIFICATION - DIESEL CAM ROLLER BUSHING FAILURES

"The [fuel pump] cam roller bushing part number 16100527 (and part number 16600336 for the kit containing cam roller bushings) for the Fairbanks Morse Engine Opposed Piston engine Emergency Diesel Generator shipped prior to August 2001 may be made from an incorrect material that is too soft for the application.

"The subject emergency diesel generator would not have been able to achieve its maximum load rating and therefore not have been able to perform its intended function."

The potentially affected plants are:

Alabama Power/Farley
Arkansas Power
Amergen /GPU/TMI
Constellation/BG&E
Detroit Edison/Fermi
Dominion/Millstone
Veeco
Georgia Power/Hatch
Vermont Yankee
Exelon/PECO - Limerick/Peach Bottom
FPL/NMC/IES/Duane Arnold
NMC Prairie Island/Northern States
Progress Energy (CP&L)
SCANA/South Carolina Electric and Gas
Electronuclear (Electrobras)

IE19

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U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

April 9, 2007

Subject: 10 CFR 21 NOTIFICATION - CAM ROLLER BUSHING
INCORRECT MATERIAL

Greetings,

Pursuant to 10 CFR 21.21 (d)(3)(ii), Fairbanks Morse Engine is submitting a written notification on the identification of a defect that is considered to be a substantial safety hazard.

There is one attachment to this letter. The FME Notification Report Serial Number 06-04 provides the information requested by 10 CFR 21.21 (d)(4). Should there be any questions, please contact me at the phone number listed above or Ted Stevenson at 608-364-8424.

Sincerely,

Dominic Dedolph
Manager, Quality Assurance

Attachment

- c: T. Stevenson
- J. Eves
- B. Schoenike
- A. Elovic

FME Notification Report Serial Number 06-04
Fairbanks Morse Engine
10CFR 21.21 (d)(3)(ii) Notification

(i) Name and address of the individual or individuals informing the Commission.

Mr. Dominic D. Dedolph
Manager, Quality Assurance
Fairbanks Morse Engine
701 White Avenue
Beloit, WI 53511

(ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which falls to comply or contains a defect.

Facility:

Vermont Yankee

Basic component which falls to comply or contains a defect:

The cam roller bushing part number 16100527 (and part number 16600336 for the kit containing cam roller bushings) for the Fairbanks Morse Engine Opposed Piston engine Emergency Diesel Generator shipped prior to August 2001 may be made from an incorrect material that is too soft for the application.

(iii) Identification of the firm constructing the facility or supplying the basic component which falls to comply or contains a defect.

Fairbanks Morse Engine
701 White Avenue
Beloit, WI 53511

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

Nature of defect:

The Fairbanks Morse Engine emergency diesel generator uses cam actuated fuel pumps to provide the high pressure fuel required for efficient fuel injection into the cylinder. The cam shaft transmits lobe

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force through a tappet (push rod assembly) to the fuel pump plunger which strokes up and down. The tappet engages the cam lobe with a spring loaded steel roller for smooth interaction. The roller rides on a bronze cam roller bushing which in turn rolls on a steel pin. Two of the twenty-four cam roller bushings installed in the diesel generator at Vermont Yankee in March 2005 were made from an incorrect leaded brass material which is much softer than the specified bronze material. The bushings made from the soft material quickly (less than 55 hours of engine operation) wore out. This resulted in a shorter fuel injection pump stroke and poor fuel injection characteristics. Poor fuel injection quality resulted in incomplete fuel burn through the exhaust system thus causing increased engine exhaust opacity.

Safety hazard which could be created by such defect:

It is FME engineering opinion that the subject emergency diesel generator would not have been able to achieve its maximum load rating and therefore not have been able to perform its intended safety function. FME engineering believes a safety hazard exists if defective bushings are installed in an engine.

(v) The date on which the information of such defect or failure to comply was obtained.

Fairbanks Morse Engine initiated the evaluation of the failed bushings on 11/27/2006.

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.

The cam roller bushings identified to be made from the incorrect material were sold to Vermont Yankee in 1989. Hardness inspection of cam roller bushings was implemented in the commercial grade item dedication process 7/30/2001. Therefore all bushings sold prior to this date are considered suspect. The following are all of the facilities that operate FME OP engines:

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Alabama Power/Farley
Arkansas Power
Amergen/GPU/TMI
Constellation/BG&E
Detroit Edison/Fermi
Dominion/Millstone
Dominion Virginia Power (Veeco)
GeorgiaPower/Hatch
Vermont Yankee
Exelon/PECO – Limerick/Peachbottom
FPL/NMC/IES/Duane Arnold
NMC Prairie Island/Northern States
Progress Energy (Florida Power)
Progress Energy (CP&L)
SCANAS/South Carolina Electric and Gas
Eletronuclear (Electrobras)

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

1. Hardness inspection was implemented 7/30/01 for the commercial grade item dedication process.
2. The FME supplier of this purchased component is required to provide a certificate of chemical analysis for each lot, implemented 12/19/05.
3. The supplier will also be required to provide a certification with hardness results for all new lots. This requirement was added to the FME purchase order item master on 2/26/07.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

All of the facilities operating OP engines, as identified in section (vi), will be notified that cam roller bushings received from Fairbanks Morse Engine prior to August 2001 were not inspected for correct hardness. Any new cam roller bushings in stock that were received prior to August 2001 should be returned to Fairbanks Morse Engine.

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In order to determine conformance of cam roller bushings within the engine, the following methods should be employed and are listed in order from most to least significant:

- 1. Check pump strokes for out of specification conditions**
- 2. Monitor exhaust smoke opacity for increased opacity**
- 3. Monitor fuel usage for increased usage**