

Part 21 (PAR)

Event # 48359

Rep Org: FAIRBANKS MORSE	Notification Date / Time: 09/28/2012 21:03 (EDT)
Supplier: FAIRBANKS MORSE	Event Date / Time: 09/28/2012 (CDT)
	Last Modification: 09/28/2012
Region: 3	Docket #:
City: BELOIT	Agreement State: Yes
County:	License #:
State: WI	
NRC Notified by: DOMINIC DEDOLPH	Notifications: RONALD BELLAMY R1DO
HQ Ops Officer: PETE SNYDER	REBECCA NEASE R2DO
Emergency Class: NON EMERGENCY	CHRISTINE LIPA R3DO
10 CFR Section:	GREG WERNER R4DO
21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE	PART 21 GROUP EMAIL

PART 21 - FAIRBANKS MORSE OPPOSED PISTON EDG OIL PUMP LEAK

"Utilities operating Fairbanks Morse (FM) Opposed Piston (OP) Emergency Diesel Generators (EDG) are as follows:

- "Constellation Energy - Calvert Cliffs;
- "Dominion - North Anna, Millstone;
- "DTE - Fermi II;
- "Entergy - Vermont Yankee; Arkansas Nuclear One;
- "Exelon - Limerick, Peach Bottom, Three Mile Island;
- "Next Era Energy - Duane Arnold;
- "Progress Energy - H.B. Robinson, Crystal River 3;
- "Southern Company - Georgia Power (Plant Hatch), Alabama Power (Plant Farley);
- "Xcel Energy - Prairie Island.

"The defect is a significant oil leak from the fuel oil pump shaft. Leakage will occur if the mechanical seal area within the pump is displaced by an impact to the pump shaft during shipment and handling.

"Even with a significant leak the pump has sufficient capacity to provide the proper operating pressure and volume of fuel oil to start the engine / EDG within the design specifications and continue operating the EDG at 100% load. However, the significant amount of fuel oil leaking while the system is under pressure, during standby and operating conditions, could potentially result in having an inadequate volume of stored fuel for the EDG to fulfill the seven day operating mission.

"FM has instituted the following corrective actions which will be effective on all shipments after September 28, 2012:

IE19
NRR

Part 21 (PAR)

Event # 48359

"1. Hydrostatic testing will be performed at FM during the dedication.

"2. Outgoing shipments will be packaged in accordance with a new packaging procedure which requires the pump be secured to a piece of wood or directly to a skid, thus prevents an impact to the shaft during shipment.

"Customers should perform a visual inspection after installation to ensure the fuel pump has no leaks. Defective pumps will have an immediate and significant leak.

"All installed pumps that are free of leaks are acceptable for continued operation."



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

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

Telephone: 608-364-8132

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

Facility:

Utilities operating Fairbanks Morse (FM) Opposed Piston (OP) Emergency Diesel Generators (EDG) are as follows:

Constellation Energy	Calvert Cliffs
Dominion	North Anna
Dominion	Millstone
DTE	Fermi II
Entergy	Vermont Yankee
Entergy	Arkansas Nuclear One
Exelon	Limerick
Exelon	Peachbottom
Exelon	Three Mile Island
Next Era Energy	Duane Arnold
Progress Energy	HB Robinson
Progress Energy	Crystal River 3
Southern Company	Georgia Power (Plant Hatch)
Southern Company	Alabama Power (Plant Farley)
Xcel Energy	Prairie Island

Basic component which fails to comply or contains a defect:

Fuel oil pump part number 16700671 for Fairbanks Morse (FM) Opposed Piston (OP) Emergency Diesel Generator (EDG).



Fairbanks Morse Engine 10CFR 21.21 (d)(3)(ii)
Report Number 12-01 Issued Sept 28, 2012

(iii) Identification of the firm constructing the facility or supplying the basic component which fails 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 defect is a significant fuel oil leak from the fuel oil pump shaft. Leakage will occur if the mechanical seal within the pump is displaced by an impact to the pump shaft during shipment and handling.

Crystal River installed a new fuel oil pump S/N 696199 which was supplied as a basic component by FM. During priming the fuel system, a significant amount of fuel was observed leaking from the shaft mechanical seal area of the pump as reported in Event Notification dated 6/22/12. FM returned the pump to the supplier / manufacturer for evaluation. The supplier's analysis report stated "an element of the mechanical seal was cocked to one side due to the shaft end of the pump receiving a substantial impact. The observed condition would result in an immediate and significant leakage."

The fuel pump is manufactured by a commercial grade surveyed supplier to FM. The supplier performs full functional testing on each fuel pump which in addition to other functional characteristics, also verifies the pump does not leak during operation. A review of FM dedication records confirmed that all fuel oil pumps, including fuel oil pump S/N 696199, was functionally tested by the supplier and did not leak during the initial factory functional test. The dedication performed by FM relied upon the certified test results provided by the commercial grade surveyed supplier and did not require the performance of any additional leak testing. However, the dedication acceptance process required inspection of other characteristics which required FM to remove the pump from its original packaging and repackage the pump. The pump was repackaged using a foam that forms to the configuration of the pump. It is suspected that the pump package was dropped by the shipping company which resulted in an impact to the shaft. This hypothesis is further supported by a second pump that was



damaged in shipping so severely that the shaft was bent and would no longer rotate. The box of this second pump also showed signs of extreme damage and the shipment was rejected during receipt by FM's customer.

Safety hazard which could be created by such defect:

Even with a significant leaking condition, the pump has sufficient capacity to provide the proper operating pressure and volume of fuel oil to start the engine / EDG within the design specifications and continue operating the EDG at 100% load. However, the significant amount of fuel oil leaking while the system is under pressure, during standby and operating conditions, could potentially result in having an inadequate volume of stored fuel oil for the EDG to fulfill the seven day operating mission.

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

On July 25, 2012, FM received the customer returned fuel oil pump S/N 696199.

On August 10, 2012, FM began the engineering evaluation.

(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.

FM is not requesting the return of any fuel oil pumps. However, the following is the FM sales history for the past 5 years:

Customer Name	Quantity
DOMINION NUCLEAR CONNECTICUT	1
FLORIDA POWER CORP	3
NEXTERA ENERGY DUANE ARNOLD LLC	1
PROGRESS ENERGY CAROLINAS	2
XCEL ENERGY	2

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action;



Fairbanks Morse Engine 10CFR 21.21 (d)(3)(ii)
Report Number 12-01 Issued Sept 28, 2012

and the length of time that has been or will be taken to complete the action.

FM has implemented the following corrective actions which will be effective on all shipments after September 28, 2012:

1. Hydrostatic testing will be performed at FM during the dedication. The Critical Characteristics for acceptance documentation has been updated to include the requirement for hydrostatic testing.
2. Outgoing shipments will be packaged in accordance with in a new packaging procedure "Distribution Center Procedure 002" released on August 20, 2012 which requires the pump to be secured to a piece of wood or directly to a skid, thus prevents an impact to the shaft during shipment.

(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.

Customers should perform a visual inspection after installation to ensure the fuel pump has no leaks. Defective pumps will have an immediate and significant leak.

In order to provide customers with confidence that pumps will not leak upon installation, FM will perform hydrostatic testing on any new uninstalled pump returned to FM, provided the customer contacts FM within the next 60 days to obtain a return material authorization number.

All installed pumps that are free of leaks are acceptable for continued operation.