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Date: November 30, 2018
Company: NRC Operations Center
Fax Number: 301/816-5151
Verification No.: 301/816-5100
Reference: Report No. 10CFR21-0123, Rev. 0
From: Dan Roberts
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Dear Sir:

Following this cover is a copy of our report 10CFR21-0123, Rev. 0,
for a 10CFR21 reportable notification on EMD fuel and soakback pumps.

A copy of this report will be mailed to the NRC Document Control Desk
and to our affected nuclear customers.

Should you have questions, please let us know.

Sincerely,

ENGINE SYSTEMS, INC.

Dan Roberts
Quality Manager



ENGINE SYSTEMS, INC.

175 Freight Road, Rocky Mount, NC 27804

Telephone: 252/977-2720
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Report No. 10CFR21-0123
Rev. 0: 11/30/18

**10CFR21 REPORTING OF DEFECTS
AND NON-COMPLIANCE**

COMPONENT: EMD fuel and soakback pumps – potentially undertorqued cover bolts

SYSTEM: Emergency Diesel Generator

CONCLUSION: Reportable in Accordance With 10CFR21

Prepared By: *Julian*
Engineering Manager

Date: 11/30/18

Reviewed By: *Dan Robert*
Quality Manager

Date: 11/30/18

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REV	DATE	PAGE	DESCRIPTION
0	11/30/18		Initial issue.

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Pursuant to 10 CFR 21.21(d)(4), ESI is presenting the required information as follows:

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

Dan Roberts
 Quality Manager
 Engine Systems Inc.
 175 Freight Rd.
 Rocky Mount, NC 27804

John Kriesel
 Engineering Manager
 Engine Systems Inc.
 175 Freight Rd.
 Rocky Mount, NC 27804

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

EMD fuel and soakback pumps of the following part numbers:

Part Number	Description
8410219	Fuel Pump, Flanged Connections
8080284	Fuel Pump, Threaded Connections
8417074	Lube Oil Scavenging and Fuel Pump Assembly (16, 20-645E4, E4B), includes P/N 8410219
8252842	Lube Oil Scavenging and Fuel Pump Assembly (16, 20-645E4), includes P/N 8080284
8417754	Lube Oil Scavenging and Fuel Pump Assembly (12-645E4, E4B), includes P/N 8410219
8447715	Fuel Pump and Motor Assembly, includes P/N 8410219
8455818	Soakback Pump and Motor Assembly
8460815	Lube Oil Soakback and Fuel Pump

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

Engine Systems Inc. (ESI)

(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.

ESI was notified by a nuclear customer of two instances where a bolt was found loose or backed out of the cover of an EMD engine driven fuel pump P/N 8410219. Following notification, ESI inspected remaining pumps in inventory and found instances where one or more the pump cover bolts were loose or lightly torqued. See Figure 1 below for a visual depiction of the pump and bolts.

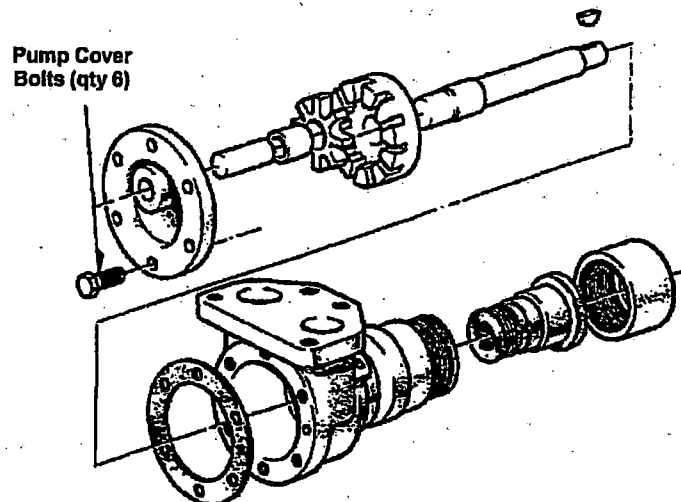


Figure 1: Exploded View of Pump P/N 8410219

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EMD fuel pump, P/N 8410219, is commonly used on all 12, 16, and 20-cylinder EMD model 645E4 and E4B engines. The pump is either mechanically driven from the engine (via the scavenging lube oil pump) or motor driven (as in the case of a backup/redundant fuel pump). The pump transfers fuel oil from the day tank to the fuel injectors to support fuel combustion. Without the supply of fuel oil, the diesel engine is unable to produce power which adversely affects the safety-related operation of the emergency diesel generator set.

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

October 24, 2018

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

The extent of condition includes pump P/N 8410219 as well as the part numbers listed in Table 1 in Appendix A. Note that P/N 8080284 is otherwise identical to P/N 8410219 except that the ports are threaded as opposed to flanged. The scavenging pump assemblies listed are upper level assemblies that contain either P/N 8410219 or 8080284. The fuel pump and motor assembly utilizes P/N 8410219. The soakback pump assemblies listed use a pump made by the same manufacturer with similar construction and therefore are included in the extent of condition.

Based on ESI's investigation the issue may extend as far back as 2014. Therefore, any of the pumps supplied from 2014 through 2018 are considered suspect.

- (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.

For all affected customers:

ESI recommends inspecting the bolts of all pumps for proper bolt tightness. Use a torque wrench and ensure all bolts are tightened to 108 to 120 in-lbs (12 to 13 Nm).

This activity should be performed at the earliest opportunity; however, it is more important for the inspection to be performed on newly installed pumps. It is expected that for pumps supplied with low bolt torque, if a problem were to develop it would be in the form of a fuel leak soon after installation. For pumps that have been successfully installed for several months or years with no detectable leakage, it is less likely that bolt(s) are loose and therefore the urgency of this inspection is reduced.

For ESI:

The dedication procedures for these pumps have been revised or are being revised to add a step to verify proper bolt torque. This will be completed prior to any future shipments. In addition, ESI is in correspondence with the pump manufacturer to implement corrective actions to prevent reoccurrence.

- (viii) Any advice related to the potential 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.

Verification of bolt tightness is non-invasive and may be performed with the pump installed (and operating). The bolts are external to the pump and the cover is stationary; there is no impact to pump operation or functionality while performing this inspection.

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Appendix A List of Affected Customers

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Part Number	Description	Customer	Customer PO	Customer Part Number	Qty Shipped	C of C Date	ESI Order	Line	Pump Serial Number(s)		
8410219	FUEL PUMP, FLANGED CONNECTIONS, ENGINE DRIVEN	FLORIDA POWER & LIGHT - ST LUCIE	02313521/00043	000036822 1	7	03/27/14	3012408	1.1	12710527 12710535 12710539 12710553 12710544 12710548 12710552		
		TENNESSEE VALLEY AUTHORITY - BROWN'S FERRY	713665	8410219	4	09/21/14	8002290	20.1	12710671 12710666 12710551 12382313		
		TENNESSEE VALLEY AUTHORITY - BROWN'S FERRY	713665	8410219	4	08/21/14	8002290	34.1	12710676 12710665 12710669 12710668		
		ENTERGY OPERATIONS INC - GRAND GULF NUCLEAR	10428304	1281504299	1	01/28/15	3013513	1.1	12710673		
		EXELON - NINE MILE POINT	00544836	0001679179 1	1	04/08/15	3013781	1.1	12710564		
		ENTERGY OPERATIONS INC RIVER BEND	10439523	0032132608	1	04/08/15	3013974	1.1	12710675		
		NEXTERA ENERGY POINT BEACH LLC	02313520/00080	0006559075 1	1	04/30/15	3014099	1.1	8497750094		
		ENERGY NORTHWEST	00344808	0058165345	2	09/24/15	3014526	3.1	8497920122 8497920128		
		EXELON - DRESDEN	703; Rel. 12686	0000043611 1	1	02/25/16	3015071	1.1	8497750097		
		NUCLEAR POWER PLANT KRSKO+	3151747/14625	105825	1	02/29/16	3014817	1.1	8497920112		
		NUCLEAR POWER PLANT KRSKO+	3151747/14625	105825	1	03/03/16	3014817	1.1	8497920124		
		EXELON - LASALLE	00572185	0000043611 1	4	05/06/16	3015350	1.1	12548101 12710734 8591700274 8591700277		
		SAVANNAH RIVER REMEDIATION LLC	5RRA069144	8410219	2	12/06/16	3015928	39.1	12710697 8591700290		
		ENTERGY OPERATIONS INC - GRAND GULF NUCLEAR	10529624	1281504299	2	01/09/18	3017555	2.1	12710403 8591700273		
		ENERGY NORTHWEST	00351174	0058165345	1	03/09/18	3017807	1.1	8197960000		
		TENNESSEE VALLEY AUTHORITY - BROWN'S FERRY	3418640	CV7548N	1	03/16/18	3017688	1.1	8591700281		
		EXELON - DRESDEN	00646095	00000436111	2	06/18/18	3018069	1.1	8197850294 8194960191		
		ENERGY NORTHWEST	00351174	0058165345	4	06/20/18	3017807	1.1	8194890101 8194960189 8194960193 8194890099		
		EXELON - NINE MILE POINT	00643368	0001679179 1	1	06/21/18	3018002	1.1	8194960194		
		DUKE ENERGY CAROLINAS LLC - OCOONEE NUCLEAR	03066435	0000157557	1	08/01/18	3018132	1.1	8196760103		
		ENTERGY OPERATIONS INC - GRAND GULF NUCLEAR	10553808	1281504299	1	08/30/18	3018608	1.1	8194960190		
		EXELON - LASALLE	703; Rel. 12989	0000048611 1	3	08/30/18	3018649	1.1	8196760104 8196760106 8195690224		
		EXELON - CLINTON POWER PLANT	703; Rel. 12989	0000043611 1	3	09/20/18	3018650	1.1	8195690223 8195690229 8193840555		
		PGS ENRIQUE MARIA HIERRO SL - ALMARAZ	N2018/018	8410219	2	10/16/18	3018083	1.1	8196760100 8196760105		
		8080284	FUEL PUMP, THREADED CONNECTIONS, ENGINE DRIVEN	FLORIDA POWER & LIGHT - TURKEY POINT	02318321/00043	0001700687 1	1	02/28/14	3012203	1.1	12523759
				OMAHA PUBLIC POWER DISTRICT	08204966	0000024379 1	3	08/15/14	3012980	1.1	12523604 12523608 12523800
				FIRST ENERGY CORP - BEAVER VALLEY	45458123	8523787	2	01/19/15	3013189	1.1	8591960081 8590700119
				PGS ENRIQUE MARIA HIERRO SL - NUCLENOR	N2016/011	8080284	1	06/03/16	3015292	7.1	8591700267
DOMINION VIRGINIA POWER - SURRY POWER STATION	4500298167			06006510	1	07/07/16	3015625	2.1	8396760113		
EXELON - DRESDEN	703; Rel. 12731			0000919419 1	3	10/31/16	3016024	1.1	8396760112 8394860265 8392800023		
EXELON - FITZPATRICK	703; Rel. 12927			00106211221	2	03/27/18	3017678	1.1	8290730210 8394860261		
EXELON - NINE MILE POINT	703; Rel. 12937			0001579058 1	1	04/03/18	3017764	1.1	8288890252		
ENTERGY OPERATIONS INC - ARKANSAS	10550517			000558-718	2	08/30/18	3018470	1.1	8194920089 8194920068		

Table 1: List of Affected Customers
(continued on next page)

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Appendix A List of Affected Customers

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Part Number	Description	Customer	Customer PO	Customer Part Number	Qty Shipped	CoC Date	ESI Order	Line	Pump Serial Number(s)
8417074	LUBE OIL SCAVENGING AND FUEL PUMP ASSEMBLY (16,20-645E4,E4B) WITH P/N 8410219 FUEL PUMP	BMPC - KAPL	7017027	8417074	1	01/28/14	3012288	73.1	12548134
		TENNESSEE VALLEY AUTHORITY - WATTS BAR	2605647	CAW481V	1	04/05/17	3016354	1.1	12547923
8252842	LUBE OIL SCAVENGING & FUEL PUMP ASSEMBLY (16,20-645E4) WITH P/N 8080284 FUEL PUMP	OMAHA PUBLIC POWER DISTRICT	00200846	0000133165 1	1	10/20/14	3012561	2.1	12523773
8417754	LUBE OIL SCAVENGING AND FUEL PUMP ASSEMBLY (12-645E4, E4B) WITH P/N 8410219 FUEL PUMP	DUKE ENERGY CAROLINAS LLC - OCOINEE NUCLEAR	03035494	0000330781 1	1	06/01/17	3016321	1.1	849275022B
8447715	FUEL PUMP AND MOTOR ASSEMBLY	EXELON - CLINTON POWER PLANT	00572667	0000092240	2	02/23/18	3015959	1.1	8295750088 8295750089
8455818	SOAKBACK PUMP & MOTOR ASSEMBLY	DOMINION VIRGINIA POWER - SURRY POWER STATION	4500386340	4202632B	1	10/31/17	3017171	1.1	8489910003 8487970346
		DOMINION VIRGINIA POWER - SURRY POWER STATION	4500394508	4202632B	2	02/06/18	3017306	-1.1	8489910003 8487970346
8460815	LUBE OIL SOAKBACK AND FUEL PUMP	ENERGY NORTHWEST	00345051	0058166535	3	01/12/16	3014666	3.1	8587800264 8497860219 8493900161
		ENERGY NORTHWEST	00351743	0058166535	2	06/25/18	3018195	1.1	8198820094 8198820096

Table 1: List of Affected Customers