

P21 93018

INITIAL 10CFR21 NOTIFICATION  
COLT INDUSTRIES EDG FUEL OIL PUMP  
PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
HOPE CREEK GENERATING STATION  
JANUARY 11, 1993

During the recent Hope Creek outage, the engine driven fuel oil pump associated with the "B" Emergency Diesel Generator was replaced. During post-installation testing of the Diesel Generator prior to turnover to operations, low fuel oil discharge pressure was observed. The Hope Creek EDGs are provided with an engine driven fuel oil pump and a motor driven fuel oil pump which is provided as a backup should the engine driven pump fail or if low pump discharge pressure is sensed. During post-installation testing of the EDG, the fuel oil discharge pressure was observed to be approximately 11-12 psi under no load condition with the standby motor driven pump running constantly in parallel with the engine driven pump. Under 100% loaded condition, the fuel oil discharge pressure was observed to be less than 5 psi with the standby motor and engine driven pump in operation. The discharge pressure for the replaced engine driven pump without the backup pump in operation was expected to be approximately 28 psi under 100% loaded condition.

The replacement engine driven fuel oil pump (Part No. P12605391) was supplied by Colt Industries (Fairbanks Morse Engine Division, Beloit, WI.). Investigation into the cause of the low pump discharge pressure determined that the plugs and associated "O" ring gaskets (Piece Nos. 40, 41 and 42) shown on the attached Colt Industries Renewal Parts List were installed in a configuration to support the operation of a fuel oil pump with a clockwise engine rotation (Part No. P12605390). However, the plugs should have been installed to support a counter-clockwise engine rotation (Part No. P12605391) which is the correct configuration for Hope Creek, and which was ordered by PSE&G from Colt Industries. Procurement documentation and labeling on the pump indicates that the correct Part No. P12605391 was supplied when, in fact, the equivalent to Part No. P12605390 was supplied.

The plugs and associated "O" rings were repositioned to support the counter-clockwise engine rotation and the EDG satisfactorily retested in both the 100% load and no-load condition. The engine driven fuel oil pump discharge pressure was observed to be 28 psi under 100% load and 40 psi in the no load condition.

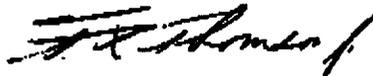
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Two (2) additional replacement engine driven pumps are currently in spare in the warehouse. These pumps have been inspected and were also supplied with plugs in the incorrect orientation. These pumps were also purchased and labeled as Part No. P12605391 but the equivalent to Part No. P12605390 was provided. The plugs and "O" rings on one (1) pump have been repositioned to support a counter-clockwise engine rotation. Damage was identified on a plug and "O" ring on the second pump. This is currently being evaluated and corrected.

Engineering evaluation has determined that operation of the EDGs with the engine driven fuel oil pump configured to support a clockwise engine rotation instead of the counter-clockwise engine rotation, and operating in parallel with the standby motor driven fuel oil pump resulted in the abnormally low discharge pressure of 5 psi in the 100% loaded condition. Effectively, the engine driven fuel oil pump under this configuration was drawing suction from the fuel oil being supplied to the EDG from the standby motor driven pump thereby starving the EDG of fuel oil. The fuel oil also provides a cooling and lubrication function to support the long term operation of the EDGs should offsite power be lost. Although the EDG did run with low discharge pressure (< 5 psi) under 100% load, the engineering evaluation concluded that the low discharge pressure could result in reduced lubrication and cooling, and as such it is PSE&G's opinion that the EDG would have failed if left running in this manner.

Each of the four (4) 4.16 kV Class 1E busses are electrically independent and supplied by a dedicated EDG. A combination of any three out of four EDGs are required to assure one division of safe shutdown equipment is available to safely shutdown the plant. The EDGs are required to function upon a Loss of Offsite Power (LOP) or sustained undervoltage to a 4.16 kV bus, and/or receipt of an Emergency Core Cooling System (ECCS) actuation signal. Since the EDGs long term operation cannot be assured in response to these design basis events, it is concluded that this deviation could create a substantial safety hazard and is reportable in accordance with 10CFR21. A 30 day written report will be submitted to the NRC by February 10, 1993.

Should you have any questions or require additional information, please do not hesitate to contact Ken O'Gara, PSE&G Licensing, at (609) 339-1370.



F. X. Thomson  
Manager - Licensing and Regulation  
PSE&G

Call-Packard DC-2V  
 Recommended Parts List

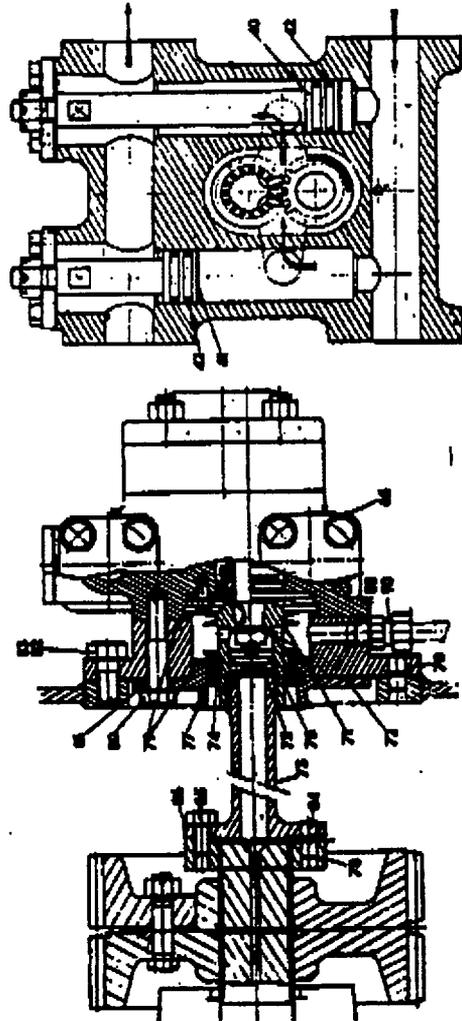
809-166  
 P12603100 -2  
 P12603101 -2

FIGURE 103 PART NAME

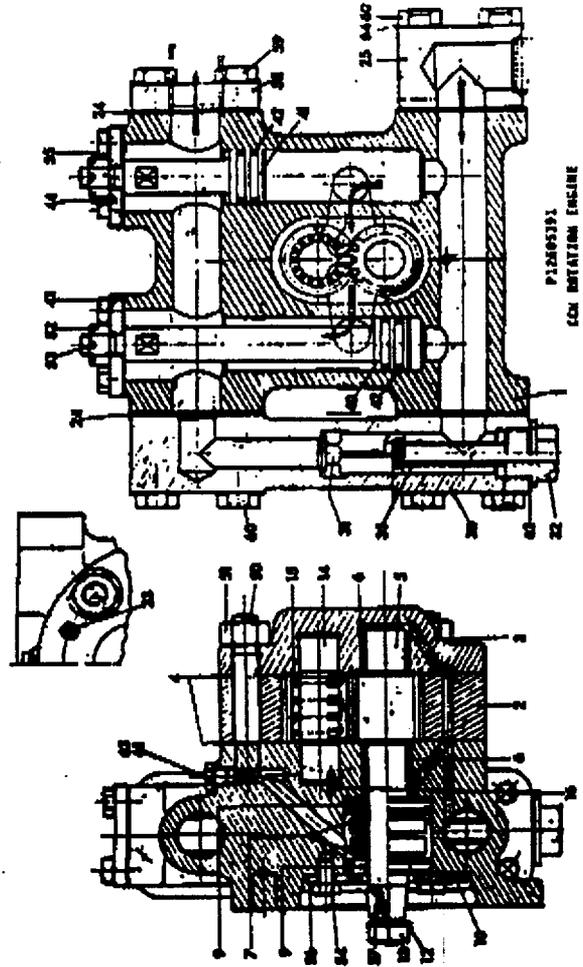
PART NUMBER USED

FUEL OIL SUPPLY PUMP AND DRIVE

NO.	DESCRIPTION	PART NO.	QUANTITY
1	Body, Pump	5121064	1
2	Mounting, Base	5121066	1
3	Cover, Bearing	5121068	1
4	Socket, Bearing	5121070	1
5	Shaft, Tooth	5121072	1
6	Shell, Bearing	5121074	1
7	Ring, Bearing	5121076	1
8	Pin, Sealring	5121078	1
9	Flange, End	5121080	1
10	Lockwasher	5121082	1
11	Shaft, Special	5121084	1
12	Pinion	5121086	1
13	Bar, Mount	5121088	1
14	Pin	5121090	1
15	Bracket	5121092	1
16	Flange, Right Angle	5121094	1
17	Thrust	5121096	1
18	Ring	5121098	1
19	Spring	5121100	1
20	Pin	5121102	1
21	Pin, Ring 3.625.1	5121104	1
22	Bracket	5121106	1
23	Flange	5121108	1
24	Stud	5121110	1
25	Bar, Bar	5121112	1
26	Bar	5121114	1
27	Collar Pin	5121116	1
28	Capacitor	5121118	1
29	Capacitor	5121120	1
30	Capacitor	5121122	1
31	Capacitor	5121124	1
32	Capacitor	5121126	1
33	Capacitor	5121128	1
34	Capacitor	5121130	1
35	Capacitor	5121132	1
36	Capacitor	5121134	1
37	Capacitor	5121136	1
38	Capacitor	5121138	1
39	Capacitor	5121140	1
40	Capacitor	5121142	1
41	Capacitor	5121144	1
42	Capacitor	5121146	1
43	Capacitor	5121148	1
44	Capacitor	5121150	1
45	Capacitor	5121152	1
46	Capacitor	5121154	1
47	Capacitor	5121156	1
48	Capacitor	5121158	1
49	Capacitor	5121160	1
50	Capacitor	5121162	1
51	Capacitor	5121164	1
52	Capacitor	5121166	1
53	Capacitor	5121168	1
54	Capacitor	5121170	1
55	Capacitor	5121172	1
56	Capacitor	5121174	1
57	Capacitor	5121176	1
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59	Capacitor	5121180	1
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61	Capacitor	5121184	1
62	Capacitor	5121186	1
63	Capacitor	5121188	1
64	Capacitor	5121190	1
65	Capacitor	5121192	1
66	Capacitor	5121194	1
67	Capacitor	5121196	1
68	Capacitor	5121198	1
69	Capacitor	5121200	1
70	Capacitor	5121202	1
71	Capacitor	5121204	1
72	Capacitor	5121206	1
73	Capacitor	5121208	1
74	Capacitor	5121210	1
75	Capacitor	5121212	1
76	Capacitor	5121214	1
77	Capacitor	5121216	1
78	Capacitor	5121218	1
79	Capacitor	5121220	1
80	Capacitor	5121222	1
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91	Capacitor	5121244	1
92	Capacitor	5121246	1
93	Capacitor	5121248	1
94	Capacitor	5121250	1
95	Capacitor	5121252	1
96	Capacitor	5121254	1
97	Capacitor	5121256	1
98	Capacitor	5121258	1
99	Capacitor	5121260	1
100	Capacitor	5121262	1



P12603100  
 CCW ROTATION ENGINE



P12603101  
 CW ROTATION ENGINE

(PARTS ARE IDENTICAL ON BOTH PUMPS -  
 NOTE DIFFERENCE IN LOCATION OF PG. 40  
 AND 41 FOR CCW OR CW ROTATION ENGINE)