

LICENSEE EVENT REPORT

CONTROL BLOCK: 1

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 PABVS1200-00000-0034111145

CON'T

01 L605000334703278380502839

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES 10

02 On 3/27/83, the Diesel Driven Fire Pump, [FP-P-2] failed its OST due to high

03 coolant water temperature. Additional starting attempts yielded continuing

04 high temperatures as well as a number of electrical problems. The pump was

05 returned to service on 4/19/83, after the defective cylinder head

06 and electrical components were replaced. There were no safety implications as the

07 redundant Electric Fire Pump, [FP-P-1] and a portable fire pump were available.

08 This is the third LER on the Diesel Fire Pump.

09 AB11 B12 B13 ENGINE14 Z15 Z16

17 83 010 99 X 0

A18719 720 721 0000 Y23 N24 A25 C74226

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS 27

10 The high coolant temperature was caused by a casting defect in the engine's

11 cylinder head. When the engine over heated, water overflowed

12 from the coolants expansion tank onto the voltage regulator causing it to

13 malfunction, producing overvoltage. The defective cylinder head and the electrical

14 components damaged by the overvoltage, were replaced.

15 E28 100029 N/A B31 Surveillance Test

16 Z33 Z34 N/A N/A

17 00037 Z38 N/A

18 00040 N/A

19 Z42 N/A

20 N44 N/A

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NRC USE ONLY

P.O. 91-7-92/6

Attachment To LER 82-010/99X
Beaver Valley Power Station
Duquesne Light Company
Docket No. 50-334

While performing the precaution steps in the "Weekly Diesel Engine Driven Fire Pump Operation Test", on 3/27/83, the water level in the cooling systems' expansion tank was observed to be low. Water was added to bring the level back to normal and the engine was started. After running for 7 minutes, the expansion tank overflowed and high engine temperature was noted. The engine was promptly shutdown. After cooling, the expansion tank was again noted to be empty. The pump was declared inoperable and was removed from service.

Assuming there were cooling system problems, the engine was flushed and the thermostat was replaced. After this maintenance, the diesel was started with overheating problems still occurring. The heat exchanger was next rodded and flushed, with the thermostat replaced a second time. During the next starting attempt, the diesel ran for 30 seconds and tripped.

Through an investigation into the cause of the trip, the voltage regulator was found to be malfunctioning. The voltage regulator damage was judged to be a problem that occurred when coolant splashed onto the regulator during the expansion tank overflow of 3/27/83. After a new voltage regulator was installed, the diesel was again started, with temperature still indicating high.

On further running attempts, the diesel was found to be still running hot with an additional starting problem. Assuming further cooling system problems, the heat exchanger and water pump were replaced; however, further testing still yielded high coolant temperatures. On 4/13/83, a Cummins (diesel manufacturer) representative inspected the engine and thought the cause for high coolant temperatures could be problems with the engines cylinder head. The head was sent to the manufacturer where through pressure testing, it was discovered that the head for the 1 and 2 cylinders was damaged. A hole was found where the injector sleeve was installed, which was caused by a casting defect. This hole in the cylinder head caused the engine to run hot and to lose water level.

After the flawed cylinder head was replaced, the engine was again started. During this run, the Fuel Shut-off Valve solenoid malfunctioned and was replaced. The diesel started on the next attempt, but the starting motor kept cranking even while the diesel was running, and an indicating light was found not functioning. The Crank Cut-off relay and the indicating bulb were replaced.

The valve, relay and bulb failures were caused by an excessive voltage being applied to them as the result of the previous regulator malfunction.

After passing its weekly Operational Surveillance Test, the pump was returned to service on 4/19/83.