

NRC USE ONLY

LER ATTACHMENT - RO #2-81-146

Facility: BSEP Unit No. 2

Event Date: September 20, 1981

On September 20, 1981, while performing Service Water and Service Water Lube System Operability Test, PT 24.1, when No. 4 diesel generator was started to observe the opening of the diesel, Unit No. 1 Service Water System supply valve, the diesel started but did not attain rated speed. The initial investigation of the event determined corrosion buildup in the valve body of the diesel left starting air bank regulating valve PRV-786, Model 310-32, had prevented the full admittance of starting air to the diesel, which resulted in the event. The valve was cleaned, reassembled and tested for proper operation. The diesel was then successfully test started and returned to normal standby readiness. In addition, a Work Request was then submitted to inspect the diesel right starting air bank regulating valve, PRV-789 during the next scheduled maintenance on No. 4 diesel generator, in order to ensure proper operation of the valve.

Prior to inspecting PRV-789 on September 24, 1981, following a main turbine trip resulting from a main generator load reject, all four diesel generators auto started, but No. 4 required 25 seconds to attain rated speed. The initial investigation of this event revealed a corrosion buildup in the 789 valve, and it was determined the event had also occurred due to insufficient starting air pressure as was encountered during the September 20, 1981 event involving the PRV-786 pressure regulating valve. PRV-789 was then cleaned, reassembled and tested for proper operation. The diesel was then successfully started and returned to normal standby readiness.

On October 7, 1981, while performing required testing due to the removal of No. 1 diesel generator from service for maintenance, No. 4 diesel generator started but failed to attain rated speed in the required <10 seconds. This investigation of this event revealed a broken terminal ring on the solenoid operator to the diesel right starting air bank solenoid valve SV-SSV1. It is believed the broken terminal ring permitted intermittent operation of the valve and is the fundamental cause of all three events.

During a "start" sequence of a diesel generator the diesel fuel regulating system receives an initial opening signal via the diesel right starting air bank. After the diesel starts, the normal hydraulic control of the fuel regulating system is supplied by the pressure developed by the diesel driven shaft oil pump. It is believed that in each of the three events, the diesel received sufficient starting air pressure to crank the diesel, but due to intermittent operation of the SV-SSV1 valve, the diesel fuel regulating system did not operate in a timely manner. In each case, the diesel would then start after sufficient engine cranking supplied enough hydraulic pressure to open the diesel fuel regulating system "fuel racks." The reason for the broken solenoid terminal lug which is fastened with a nut and is wrapped in electrical insulation could not be determined. It is presently under consideration to evaluate the starting air moisture problems of the diesel generators' starting air systems.