

Power Outage

COVEY CASE STUDY

Procex Pty Ltd (an associate of Covey Consulting) investigated the root causes of a power outage and subsequent damage at a glass manufacturing plant.

The investigation found that failure of batteries in the backup power supply of the standby diesel generator Control Unit caused the circuit breakers connecting the incoming power and the diesel generator set to trip. Failure of the batteries was most likely precipitated by high temperatures in the switch room.

The failure of the batteries alone should not have caused the trip. However, the parallel connection to the generator set main batteries had not been reconnected following system commissioning and testing several months before. Therefore, the Control Unit had been totally supported by the backup power system since start-up.

Following the power failure, the gas blocking valves for the furnace did not go to their fail-safe positions. This was traced to "sticking" of both the solenoid valves that supply air to the blocking valves. Inspection of the valves showed some material deposited on the solenoid plunger and a matching pattern of similar material inside the barrel of the plunger guide. Analysis of this material by Covey Consulting showed that it was primarily hydrocarbon oil that matched with a sample from the air compressor lubrication oil.

Operating crews had not been aware that the gas continued to burn and this resulted in damage to the furnace heat recovery system.

Recommendations to reduce the likelihood of such an incident occurring again included:

- Reconnect primary DC power from generator set
- Install air conditioning to control Switch room temperature
- Improve the alarming of faults
- Shield gas train solenoid valves from heat radiated from furnace
- Install more appropriate solenoid valves
- Install filters on the plant air supply
- Add energy usage and heat recovery performance calculations to the SCADA system.

