

Case Study

**Termination fault prevented: Large Industrial Chemical Plant, South Korea
May 2016**

Summary

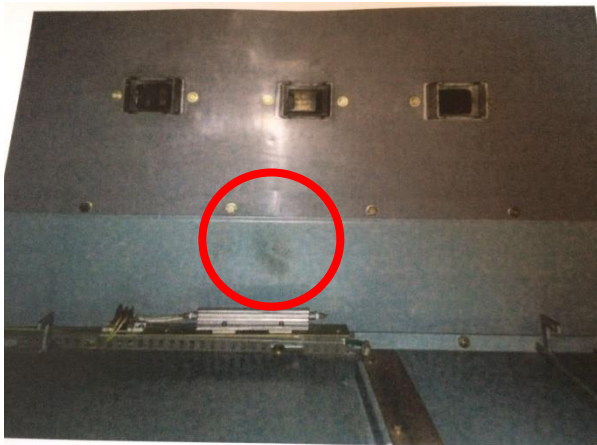
A small PD spike was detected by the ASM monitoring system in July 2015. IPEC kept a close eye on this and in February of 2016, it was seen to be rising. The criticality went from 0 to 100 in a very short period of time meaning a failure was imminent.

Details

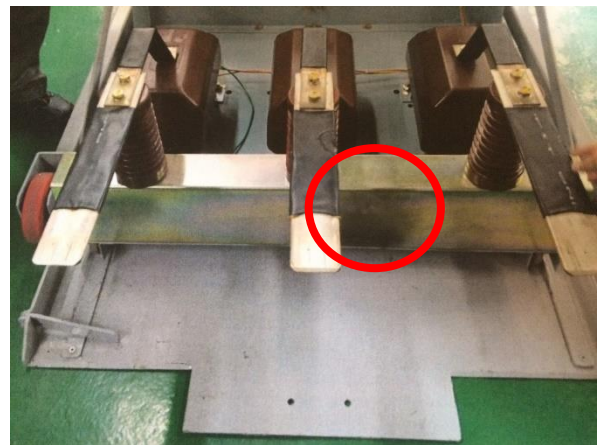
High, and continually rising Switchgear PD was detected on a termination in February of 2016, after some small activity was spotted the previous year. The criticality then hit the maximum threshold of 100 in May of 2016. Immediate action was required to locate the defect and remove it.

The customer confirmed that an onsite investigation was conducted and carbonisation was found in the panel next to a heater. The heater is used to keep the surrounding environment dry, however some carbonisation from the heater had started to conduct the electricity and was short circuiting. If carbonisation is present anywhere in the area, it increases conductivity and therefore decreases insulation properties.

The images below show obvious signs of surface tracking and burning from the carbonisation. The customer believes that arcing was occurring in this area.



Inside panel where the heater was causing the carbonisation



Carbonisation seen from arcing

Conclusions

IPEC recommended that the network be taken offline immediately in order to replace the faulty termination. The customer conducted the repair and put the system back online.

Some tests were conducted using Megger equipment to compare results before and after the repair. The Megger device is attached onto the outside of the insulation and 11,000 volts is put through it. The instrument then measures the resistance value, the higher the value the higher the resistance there is and hence there is less chance of a short circuit. Before the repair was conducted the instrument gave a reading of 1.3Ω , which is a very low resistance reading after an injection of 11,000 volts. This means that the resistance was very low and the insulation is compromised. After the repair the Megger reading showed 447Ω which means that the resistance was over 300 times more efficient, see images below.



Results before the repair was taken out



Results after the repair was taken out