

# Case Study – Transformer & Switchgear replacement due to excessive fault damage.



Engineered Systems (Electrical) Ltd were recently called out of hours to attend an emergency loss of power at a valued maintenance customer in Huddersfield, West Yorkshire.

Whilst in the middle of production the customer had lost power to a 1600kVA 11/0.433kV transformer and the dedicated LV incoming 3200A panel. The ESE Ltd Senior Authorised Person arrived at site within the hour and assisted in making the substation safe for investigation.

Upon initial visual inspection, it seems a leak from the roof of the warehouse made its way into the top of the LV distribution panel. The ingress of water caused a short between two phases. The resulting fault current transferred through the transformer and operated the time limit fuse in the transformer close coupled High Voltage switchgear.

ESE Ltd test engineers attended site and carried out a series of tests on the transformer and cables.

An insulation resistance test on the transformer showed no signs of phase to phase or phase to earth faults.

A ratio test was then carried out on the windings, this is an AC low voltage test which determines the ratio of the high voltage winding to all other windings at no-load. The ratio test is performed on all taps of every winding.

This test showed that there was an open circuit on the L1 phase winding. The reason for this anomaly was that the influx of fault current in the transformer caused a braised connection to melt and disconnect.

To ensure production could continue, ESE Ltd and the customer agreed that the transformer would need to be replaced urgently. The customer also decided to replace the close coupled 11kV ring main unit. Upon receiving the order for a replacement up-rated 2000kVA 11/0.433kV ESE Ltd transformer and a new 11kV Ring Main Unit with circuit breaker protection. ESE Ltd engineers worked tirelessly to test and prepare the stock equipment for dispatch.

Working around the clock our installation engineers attended site, removed the damaged equipment and replaced the equipment within 24 hours. Our pragmatic, swift approach and quality levels of stock equipment ensured in this unfortunate event that disruption was kept to a minimum.

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