

Covid-19 lockdown | Electrical Plant Risk Profile

Compiled by John Sherriff | May 2020 | Rev 1

Scope

Electrical engineers should carefully consider the best practice to ensure the reliability of the plant and safety of the personnel during and after the lockdown period.

Why do risk assessments

One of the most common electrical failure modes is a flashover due to compromised insulation systems. Early detection and identification of deteriorating insulation is a key predictive maintenance tool to address this problem. The different stresses that increase the rate of insulation degradation can be summarised into **TEAM** stresses.

Thermal - High thermal stress that deteriorate insulation systems until failure

Electrical - Poor electrical installations are the number one cause of failure

Ambient - High operating temperatures and moisture ingress contribute to failures

Mechanical - Poor electrical contacts can add to premature failures.

Challenges

One of the challenges during the lockdown period is to avoid electrical failures that can lead to catastrophic flashovers due to the above team stresses. The most important factor is early detection of risk (defects) to be able to manage the following limitations as:

- **Repair/replace of failure components.** Due to the lockdown process, limited availability and access of the components.
- **Limited resources.** Distance between resources in a small space to conduct repair work in small spaces i.e. substations.

Key to early detection

On-line assessment is the key to early detection of defects within the MV and HV electrical systems. The key is to identify **TEAM** stresses and therefore, the on-line condition assessments must be conducted with the plant in operation, at system voltage, at operating temperature and under normal mechanical and electrical stresses.

Circulating currents in the earth system



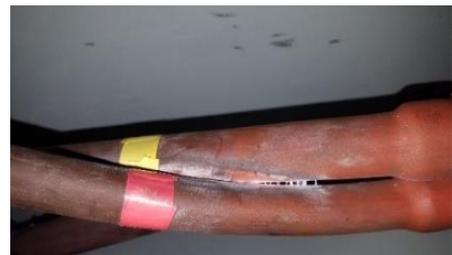
High resistant connections



Surface tracking creating electrical trees



Produce chemical by-products



It is time to make use of the on-line assessment process to enhance reliability and safety

Limited resources to be on site (2 per team)



Data acquisition



Data up-load to engineering team



Off-site data analysis



Final report with risk profile of each component

