TechTalk

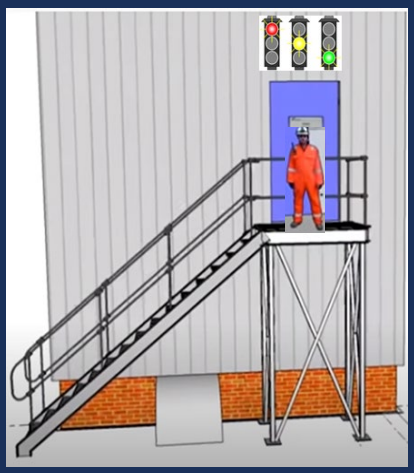
MV Switchgear | The Art of Prediction

Compiled by John Sherriff | May 2020 | Rev 1

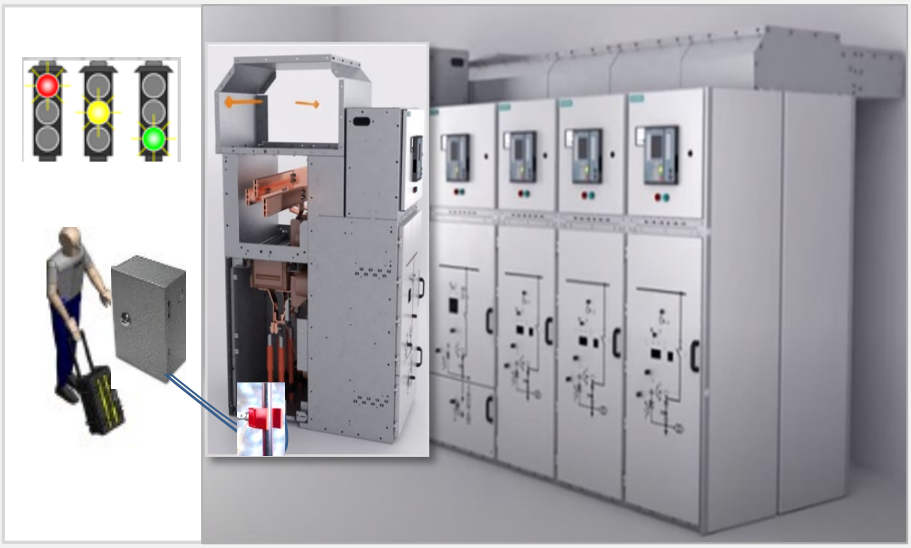
The scope

Failure of electrical switchgear can cause death, severe injury and significant damage. Switchgear failure is rare, but when it occurs, the results can be catastrophic. Switchgear failures mostly happen during, or shortly after, switchgear operation.

As equipment ages, it is expected that plant performance will deteriorate until it is necessary to shut units down. Plant performance should, however, not have to be compromised. With the implementation of reliable In-Time condition monitoring technologies, it is possible to detect early warnings of premature electrical discharges that lead to switchgear failures. These technologies offer highly visible, convenient and safe detection. Discharges are categorised according to condition risk levels and configured in alarms systems that are fitted to switchgear panels. Traffic lights are connected to these alarms and mounted on the entry doors of the main substation for anyone to see the failure risk levels before entering the substation.



Electrical Discharges	Enter Substation	Recommended Action
Red **High**	Arc-flash suit	Down load In-Time monitor data and analyse. **Investigate defect and repair**.
Amber **Moderate**	PPE as per client safety requirements	Periodic down load In-Time monitor data and analyse
Green **Low**		Keep on trending



Partial Discharge sensors must be fitted on the bottom of the cable terminations. The sensors will be connected to the In-Time monitor that will detect and trend electrical discharge pulses D(PD).

The Q_{max} values will trend and link to traffic light alarms indicating the risk levels.

The In-Time monitor data acquisition system (1 to 60 channels) will trend electrical discharge (PD) activities as defined by IEC 60270.

The data can be downloaded by the inspector from the monitor (monthly) to be analysed or the data can be placed on an IIoT platform connected to a dashboard.