

# QUALITROL®

AUGUST 2020 • POWER GENERATION

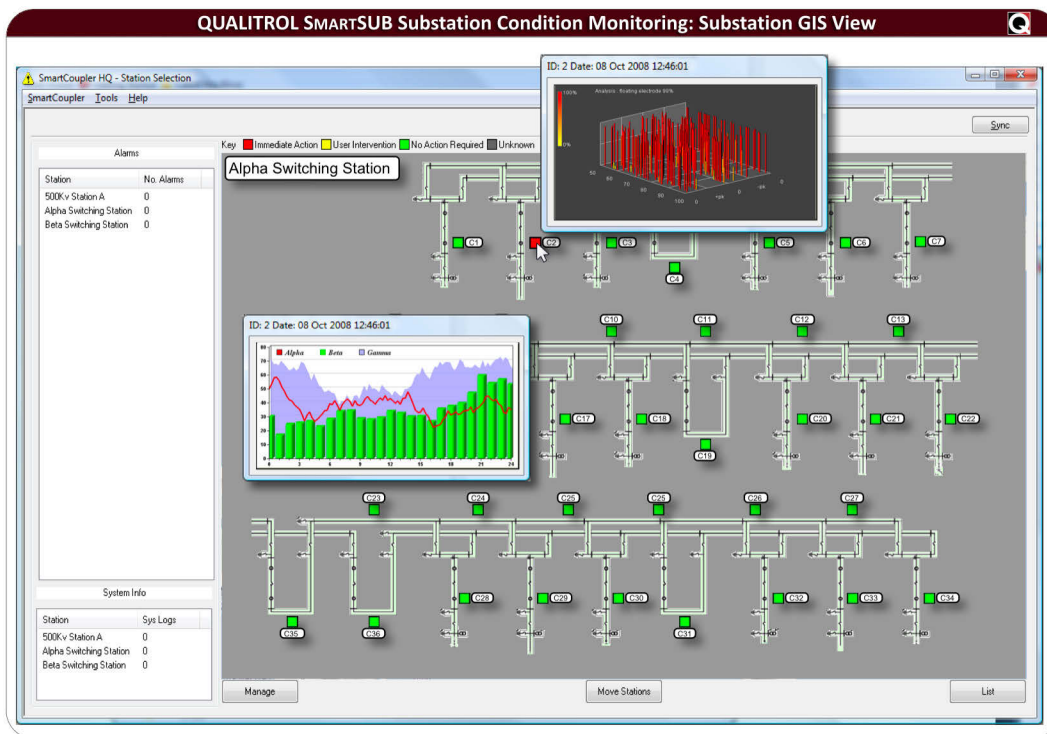
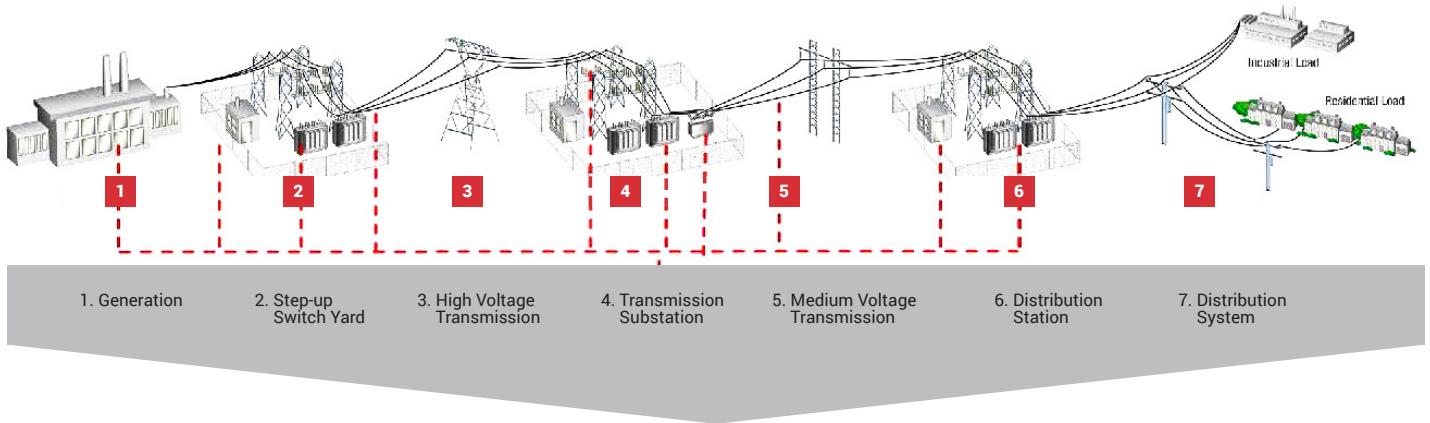
## STATE OF THE ART IN GIS CONDITION MONITORING AND RETURN OF EXPERIENCE OF MORE THAN 20 YEARS PLUS IN GIS MONITORING

Technical Whitepaper by Thomas Linn, Qualitrol DMS



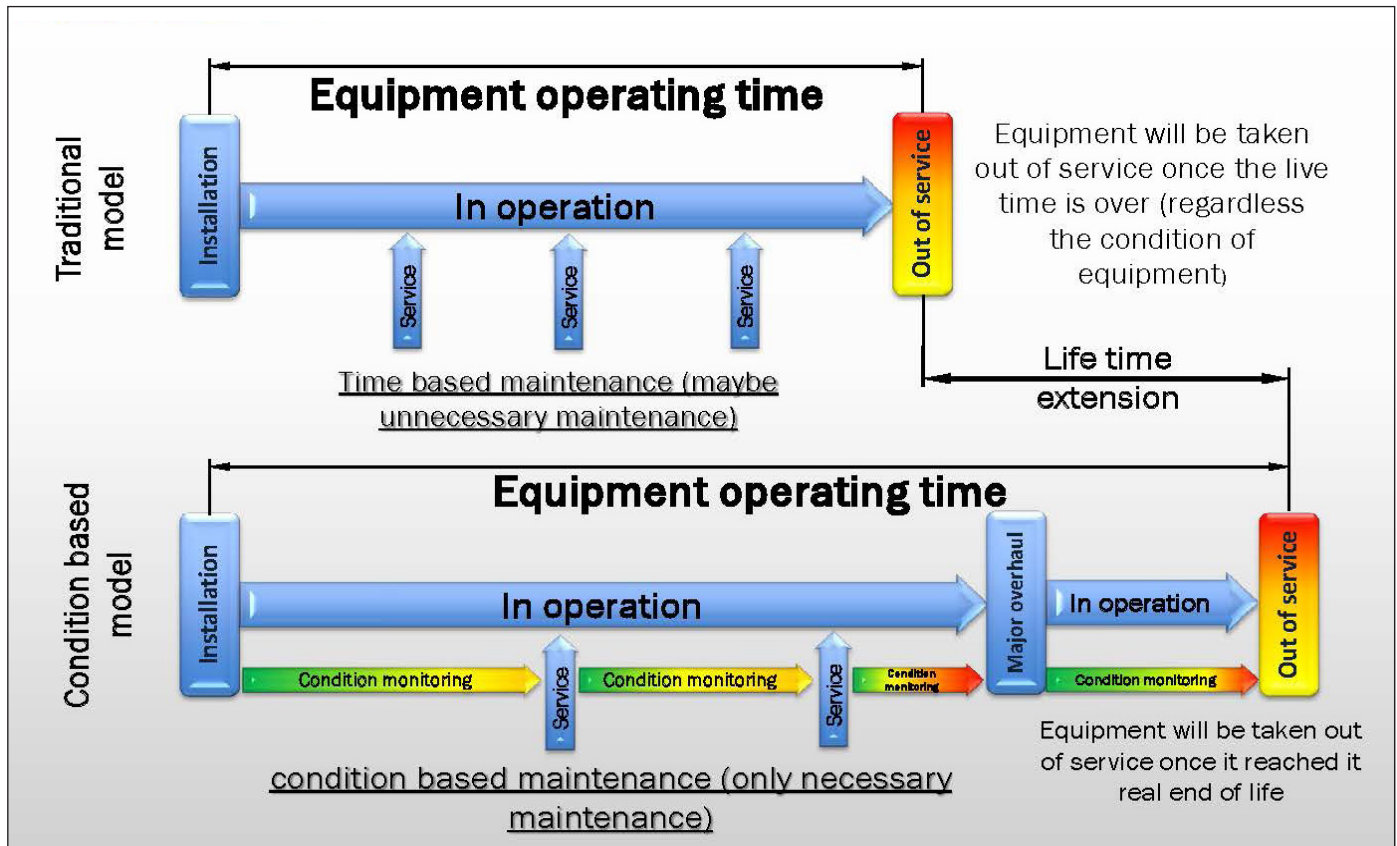


## WHY TO DO ONLINE CONDITION MONITORING?



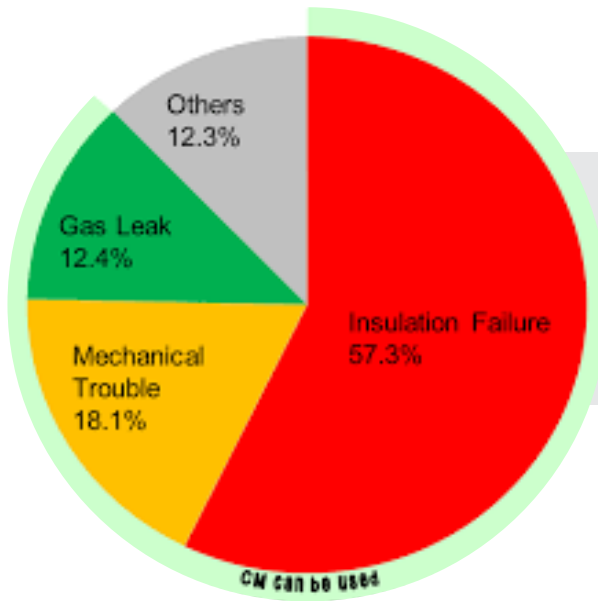


## CONDITION MONITORING: AS ECONOMICAL BENEFIT



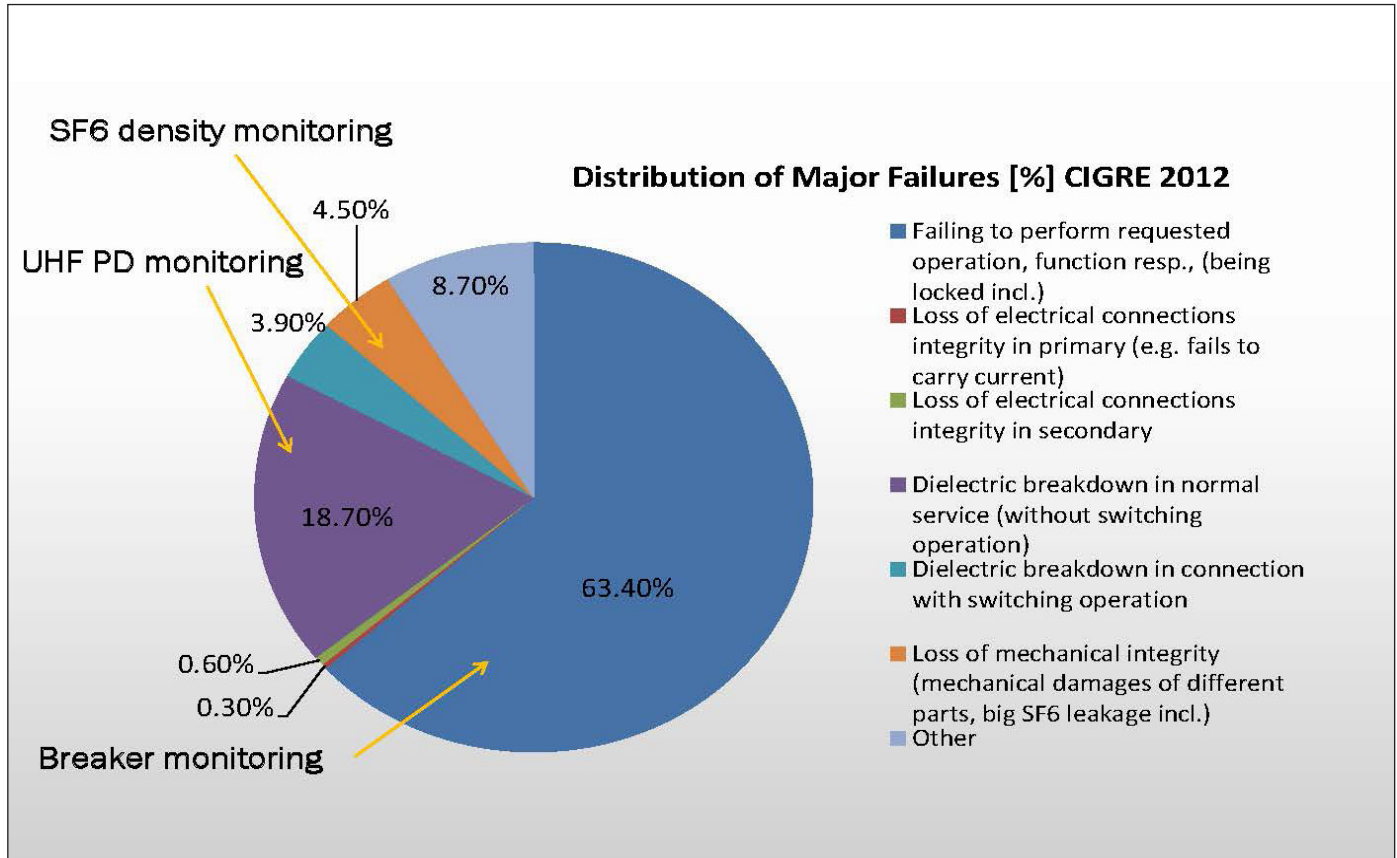
**CONDITION MONITORING: TO PREVENT FAILURE**

**Distribution of Major Failures [%] CIGRE 1992**



**How is it looking today after 20 years of PD on-site testing and PD monitoring implementation?**

**CONDITION MONITORING: TO PREVENT FAILURE**

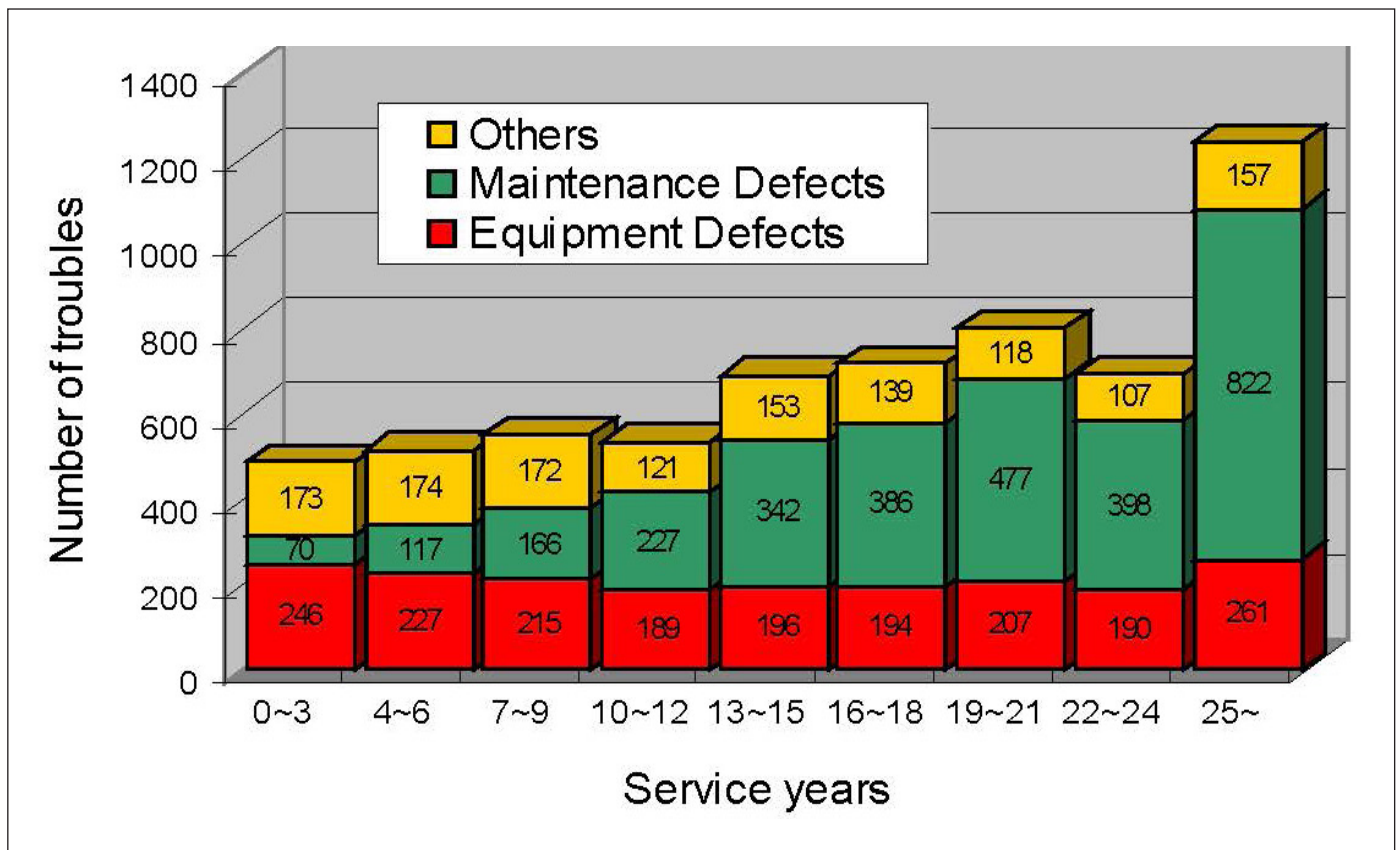




## CONDITION MONITORING: TO INCREASE MAINTENANCE INTERVALS

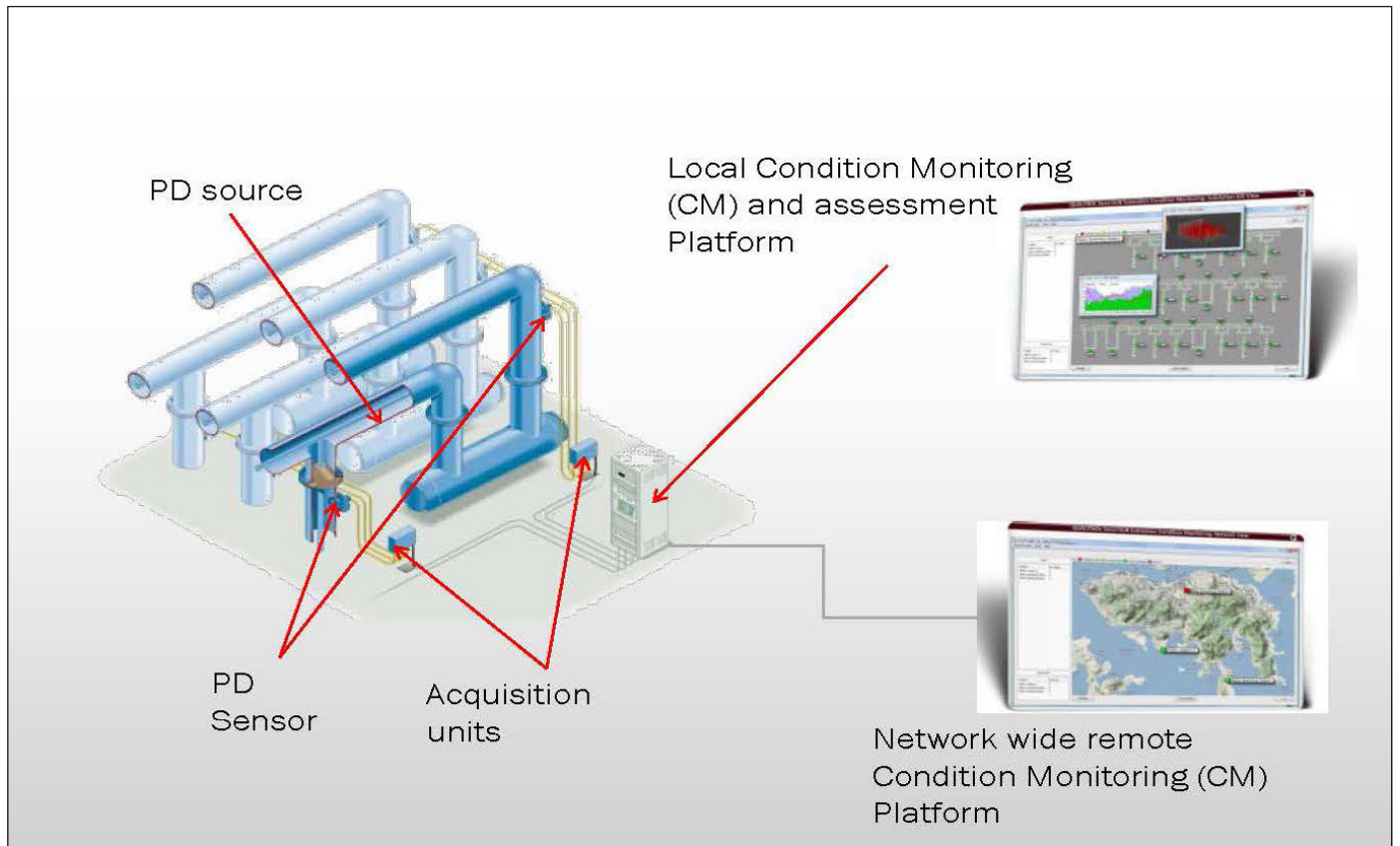
**In old equipment maintenance is a big contributor to failure.**

Therefore reducing maintenance work will reducing the risk to introduce failures as result of maintenance!



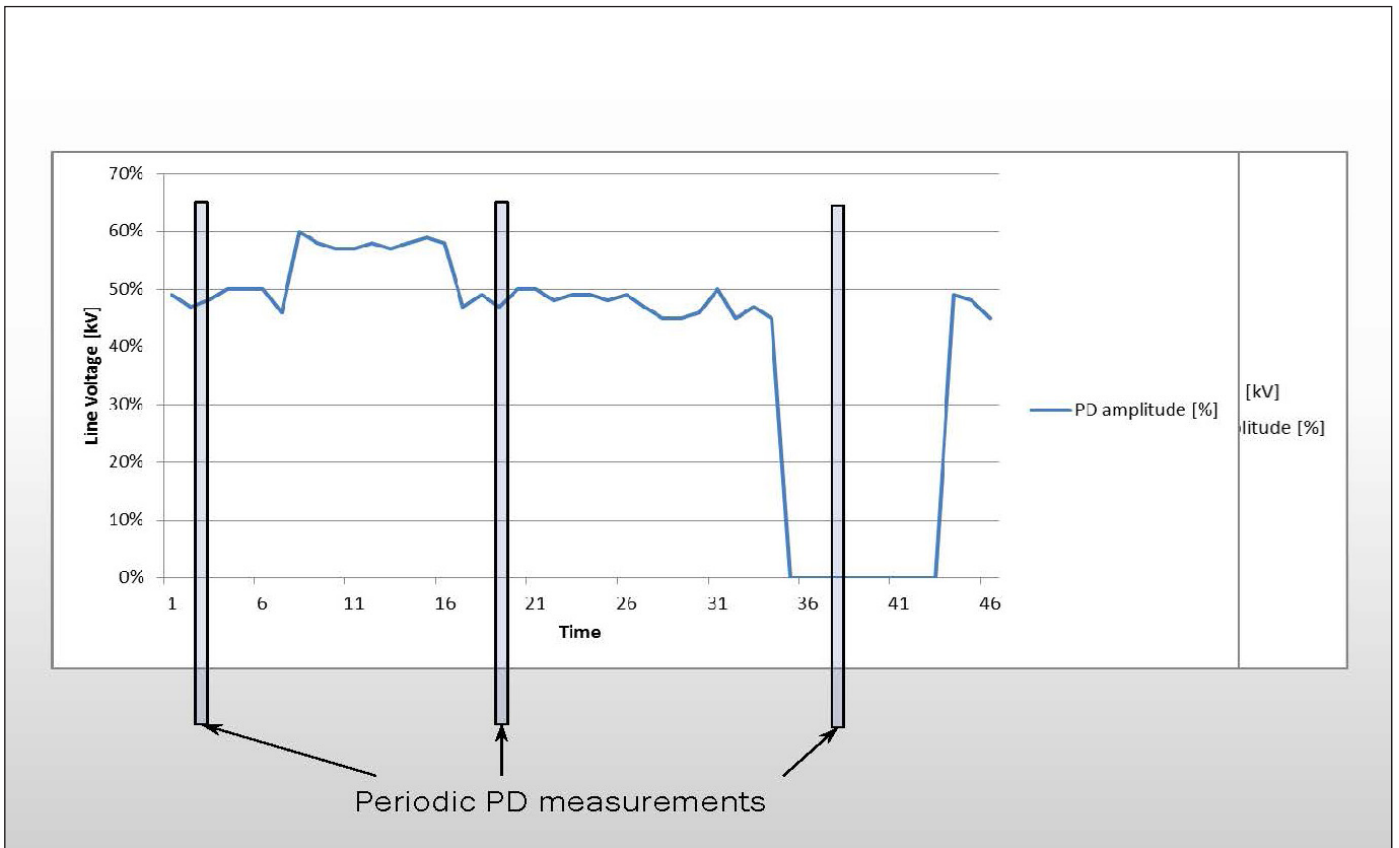


## COMPONENTS OF PD MONITORING SYSTEM





## GIS PD MONITORING – HISTORY GRAPH







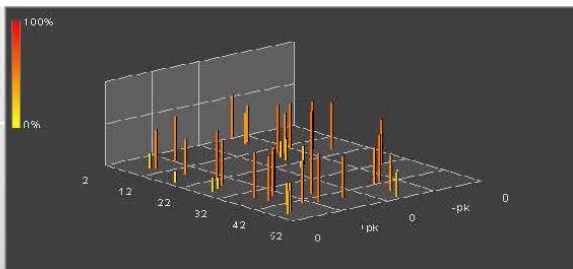


## GIS PD CASE STUDIES

### Examples from our experiences

Al Jasra 400KV GIS, Bahrain

- One of the substation in GCC link
- PD activity was observed during operation
- Fault detected, and located by Qualitrol PDM system and services
- Investigation indicated surge arrester was the source of the signal
- Saved utility from potential outages



PDM system output: Single Cycle Display

## GIS PD CASE STUDIES

### Nuclear Power Plant, UK

- Net electrical output: 1190 MW
- Palm Joint Fault (1994)
- Stress cone failure (in 2012)
- Fault detected by Qualitrol PDM system and located prior to flashover
- Saved potential loss of £250K per day for the utility (due to the loss of power supply)



Stress Cone Fault (2012)



Palm Joint Fault - 1994

**GIS PD CASE STUDIES**

**Breaker Particles**





## CONCLUSION

Supports the condition based maintenance strategy:

1

**Early warning system to detect serious defects, which can cause breakdown**

Proven to help on preventing failures

2

**Contributes to the condition assessment of a GIS installation**

Supports condition based maintenance strategies

Supports to realize economical benefits in terms of longer maintenance intervals and using the GIS till its really end of operational life

## CONDITION MONITORING IN GENERAL

Looking for a change of the monitored parameters, which indicates a change of the condition of the GIS



FOR MORE INFORMATION ON  
PRODUCTS AND SOLUTIONS

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