camlin energy

TOTUS is the ONLY Transformer Monitor that can separate PD in the Bushings from PD in the Main Tank.

The benefits of monitoring PD in Bushings with TOTUS

Early detection of PD can significantly improve risk diagnosis, driving quick and accurate decision making. Analyzing the PD Pattern and correlating it with other parameters makes it possible to understand the nature of the defect and determine the best technical actions.

Why monitor PD?

In over 70% of cases monitored by Camlin PD was a factor, often in early stages.

Camlin bushing monitor including PD can identify:

- ✓ Capacitance short circuits
- ✓ Arcing
- ✓ Defects in the C2
- ✓ Internal contamination
- ✓ Surface tracking
- ✓ Internal cavities in RIP insulation

Online PD monitoring can:

- Detect anomalies at EARLY stage of degradation, in particular on RIP bushings
- Detect failures not easily detectable with standard tests
- Correlated PD with Leakage current to determine failure mode and indicate appropriate offline test

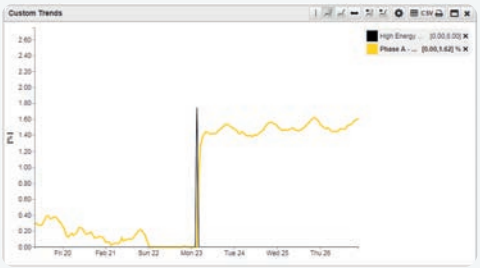
Data

1. Simultaneous Data collection

- Online Leakage Current
- Online Load
- Online Partial Discharges
- Online Arcing
- Online Temperature

2. Data Correlation and Information

A high energy Partial Discharge has occurred at the exact same instant of leakage current step increase in phase A



3. Application of Knowledge

In case of a short circuit between internal layers the current detected at the bushing can increase and partial discharges or arcing events could occur during the breakdown

4. Prescriptive Action

Due to the small change in the leakage current the capacitance test could be challenging: it is suggested to take an oil sample and test DGA.

OFFLINE DGA results for Phase A and C bushings		
	Phase A	Phase C
H_2	17	28
CH_4	40	39
C_2H_2	76	0
C_2H_4	44	1
C_2H_6	32	62
CO	71	53
CO_2	564	789
N_2	150.862	156.665
O_2	10.280	4.337

Decision

Acetylene >70 ppm confirms arcing activity detected by online monitor -> Replace bushing