

Requirements for UHF Partial Discharge Monitoring Systems for GIS

SC D1

PS 1: Testing, Monitoring and Diagnostics
Q6 What is preventing on line PD monitoring
becoming widely accepted ?

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Requirements for UHF PDM Systems for GIS

- The UHF method was introduced in the late 1980's for PD measurements and is now widely accepted and used worldwide by GIS manufacturers for routine testing, on-site acceptance testing and diagnosis, and by utilities for online PD monitoring.
- In the last 10 years, more than 700 PDM systems based on the UHF method have been installed on GIS throughout the world, monitoring more than 85,000 UHF sensors.
- However, the technical requirements of PDM systems are not standardized, the related recommendations vary significantly.
- Technical weaknesses of current systems:
 - External interference discrimination is very challenging, often leading to large numbers of false alarms
 - Expert systems are not yet sufficiently effective or accurate enough
 - Alert/warning procedure does not consider results from the sensitivity check (CIGRE TB 654) and from the approximate signal profile evaluation

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CIGRE WG D1.66 is tasked with defining GIS PDM system requirements to ensure that signals from incipient PD defects are reliably detected, monitored, and interpreted so that asset managers can take prompt and appropriate actions to prevent equipment malfunction.

- **A novel warning/alert procedure is proposed.** The results from the UHF Sensitivity Check (CIGRE TB 654) and from approximate PD Signal Attenuation Profile evaluation are used to set the optimum signal amplitude threshold value for all connected UHF sensors, and to define the response of the PDM system when those pre-set threshold levels are exceeded.
- After detection of PD activity, further steps are necessary and PDM systems should provide an **efficient and automated evaluation of the PD defects** type. It plays a pivotal role in both reducing false alarms and revealing defects which actually pose operational risk.
- **Rapid, efficient, and effective risk assessment based on PD diagnostics is mandatory** and must take technical as well as non-technical parameters into consideration.

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A novel warning/alert procedure

