TechTalk

Advanced On-line Condition Assessment of MV Cable Systems

Compiled by John Sherriff | April 2020 | Rev 1

The scope

The On-line condition assessment technologies with large bandwidth and memory, is capable of acquiring the entire pulse shape of a large number of partial discharge signals, allowing deep partial discharge (PD) analysis to be performed.

The acquisition units are provided with ultra-wide bandwidth acquisition systems, which collects not only PD pulse peak and phase (as it is done by the digital instrumentation commonly available), but also the PD pulse waveforms.

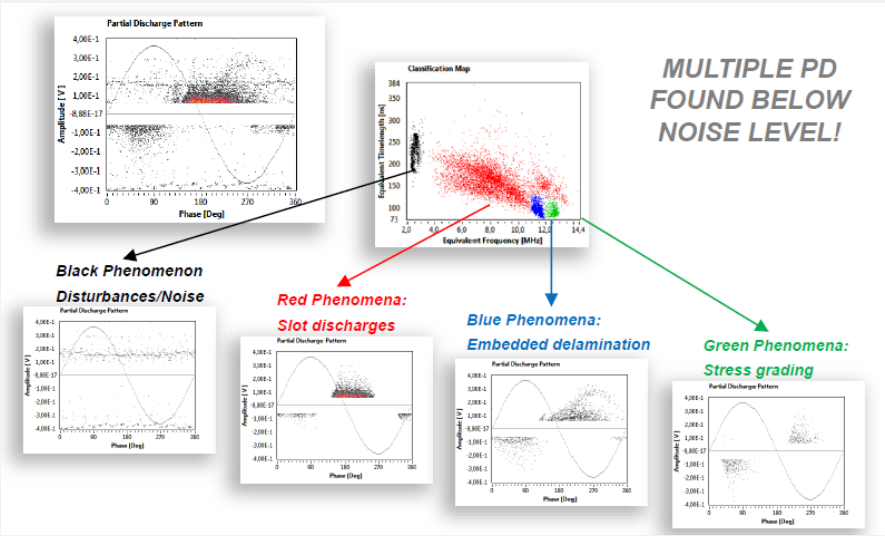
Key challenges

- **The key challenge for any analytical processes are: -**
- Separation of PD signals from noise signals
- Identification of the type of PD signals
- Diagnosis of the risk of the defects

- In fact, an efficient separation of different discharge activities, including noise rejection, can be achieved through pulse shape analysis.

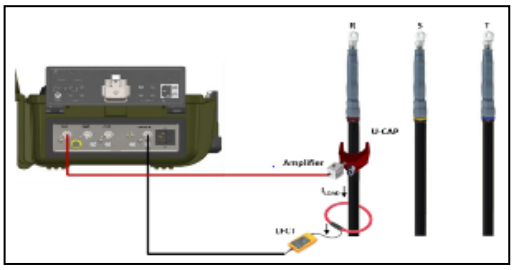
Separation of PD signals from noise signals

Partial Discharge separation from external electrical interference and back ground noise disturbances. The discharges can be split and identified as internal (Insulation), Surface (Tracking) and Corona partial discharges.

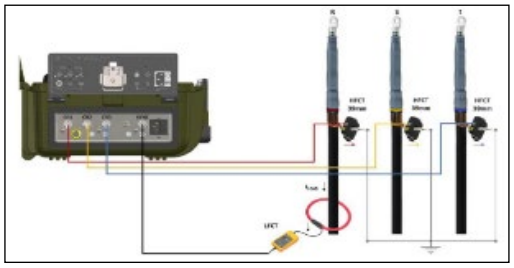


Process actions

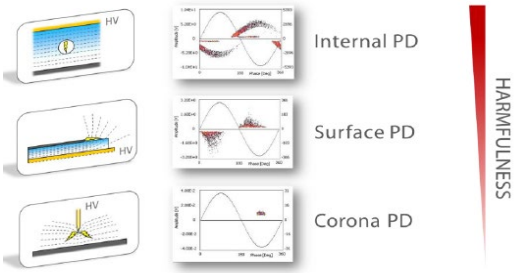
Special U-Cap sensors can be used on the outer insulation of the cable during the data acquisition process.



HFCT sensors should be used if the termination earth straps are available. The HFCT sensors are more sensitive and permits assessments of long run cables.



Partial Discharge Phenomena



On-line Condition Assessment Process

Arrangement

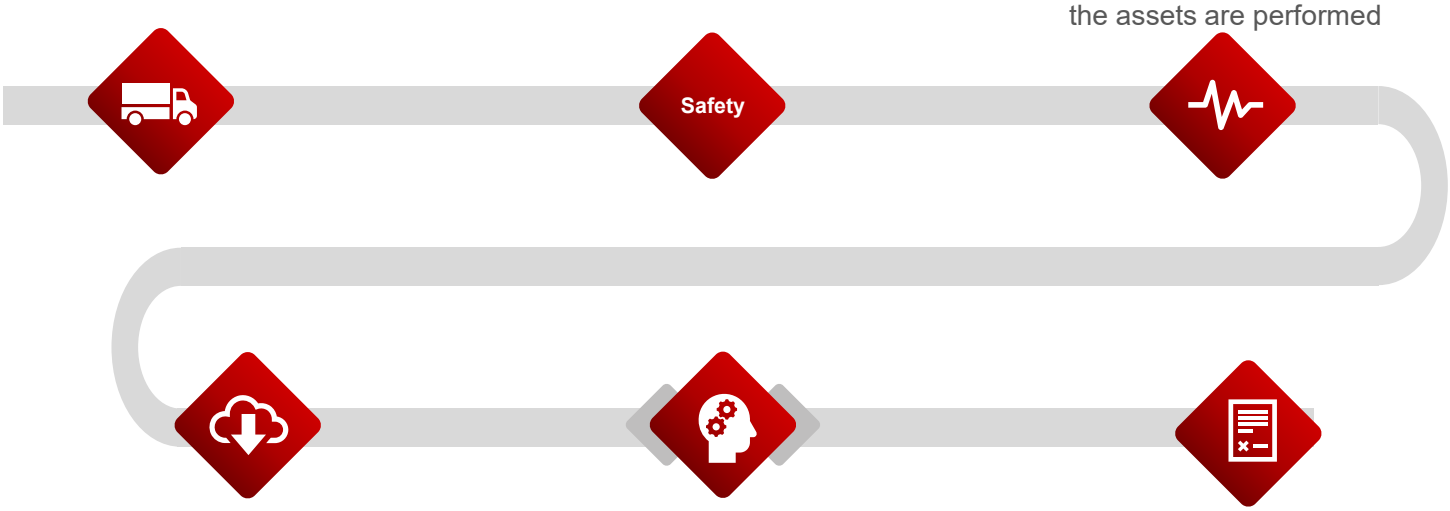
Team go on site

Site access and safety

Permit and risk assessments

Execution

On-line PD measurements of the assets are performed



Data Upload

Measurement results are sent to experts for the analysis

Data Analysis

Data are analyzed by Engineering team

Final Report

Final report with detailed conclusion, recommendations and priority list/trend evaluation is released within 2 weeks