SMARTER PARTIAL DISCHARGE MEASUREMENTS

Measuring Partial Discharge (PD) activity online is nowadays widely accepted by electrical engineers worldwide as an effective means of assessing the condition of live MV and HV assets. Its importance is particularly acute in an era of capital constraint and growing pressure to ensure the safety, reliability and performance of ageing assets.

By Neil Davies, EA Technology Pty Ltd

The 'PD revolution' has taken little more than a decade and spawned a host of instruments for detecting and quantifying these small electrical discharges. Collecting PD readings has never been simpler. But how can this data be converted into information that is genuinely useful for deciding when to fix or replace potentially failing plant, or gain reassurance that non-intervention is the best option?

The interpretation of PD readings has traditionally relied on the skills of experienced engineers and technicians. They alone have been able to judge if a PD measurement indicates real problems - or whether it might be a false alarm, influenced by other electrical noise or environmental factors. But even they have faced the headache of interpreting multiple PD warnings and measurements in order to target interventions in the most effective ways.

EMBODIES SOPHISTICATED ALGORITHMS

EA Technology has embraced these concerns to develop what we believe is the first truly smart handheld PD instrument - the UltraTEV Plus^2. Like our previous UltraTEV instruments, it measures PD in the ultrasonic and TEV ranges. The principal difference is that it now embodies sophisticated algorithms which interpret PD measurements automatically and tells the user clearly what they mean in real terms.

The new UltraTEV's algorithms are derived from EA Technology's over 40 year history of studying the causes of PD and its effects on electrical plant, including our unique database, recording the degradation and failure of tens of thousands of assets. So when an operative at any level uses the UltraTEV Plus^2, they are accessing the know-how of hundreds of engineers with decades of experience.

You get a red light on a PD instrument - but what does that mean? The latest smart handheld has the intelligence to provide the answers.

FAR GREATER DEPTH AND DETAIL

We believe the implications of adding such intelligence to a PD instrument are far reaching. Personnel with limited experience can be up-skilled instantly. Senior engineers and technicians - the power users - will find their jobs much easier and be able gather asset management information in far greater depth and detail. And everyone involved with PD measurement will be able to add value by covering more assets, more quickly and more accurately.

Fears that experienced engineers may feel their hard-won expertise is challenged by this machine intelligence have proved unfounded. We have carried out extensive trials with members of the PD User Group, which we host internationally, pitting the UltraTEV's auto-interpretation against personal skill and judgement, in terms of what PD measurements mean. Users have been gratified to note that their skill-based interpretations have been in agreement with the instrument's findings.

One of the most important features of the new UltraTEV is its ability to discriminate between meaningful PD activity and a variety of noise, interference and environmental effects, which are clearly displayed as phase resolved and waveform plots. This is indeed a skill that has been developed by engineers over years. The difference now is that anyone using the instrument can see it immediately on screen.

INTERPRETS SPECIFIC SIGNALS

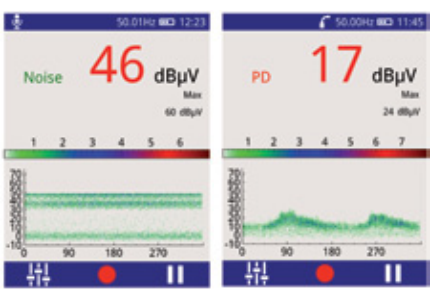
Similarly, the UltraTEV's ability to discriminate between various causes of PD activity places a wealth of useful information in the hands of less experienced operators for the first time. For example, the instrument will indicate if internal PD is the result of factors such as floating metalwork, or voids in insulation, because it recognises and interprets specific signals in each case.

As with the best smart phones, we have put a lot of work into making the user interface intuitive and friendly, with a menu-driven touchscreen and keyboard, while algorithms and intelligence work invisibly in the background. An accessory plug enables the connection of various sensors, including RFCTs for PD measurement in cables. It also features extensive data storage and connectivity facilities via USB, WiFi and SD card, so information can be captured and transferred to asset management systems on computers.

SUMMARY

The world has come a long way since EA Technology launched the first multi-sensor PD handheld in 2003 - the UltraTEV Detector. Like the mobile phones of its day, the Detector was effective but limited by modern standards. With the UltraTEV Plus^2, PD instruments just got a lot smarter.

TEV interpretation screens include Phase Resolved view to discriminate between PD and noise.

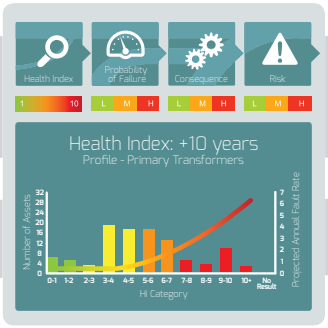


The Ultrasonic classification algorithm also differentiates PD and noise.

The new UltraTEV Plus^2 *is fully connected.*

Safer, Stronger, Smarter Networks

Monitored Solutions



Condition Based Risk Management

Partial Discharge

Smart Grid Solutions

EA Technology is a global provider of technical solutions helping our customers:

- Improve network reliability
- Increase safety
- Optimise network operations
- Make smarter investment decisions
- Build smarter grids
- Reduce cost

connect with us

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