

Long lengths transmission power cables on-site testing up to 500kV by damped AC voltages

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Since 2004 damped AC (DAC) Hz voltages are in use for on-site testing and diagnosis of (E) HV cables. DAC testing is an alternative method to conventional ACRTS testing and has got at many utilities and service providers its acceptance for:

- quality control of cable and accessories installation during after-laying testing,
- maintenance testing during operation or in conjunction with repair work after a failure,
- condition assessment of service aged cable circuits,

In addition to the equivalence of sinusoidal damped AC voltages (in the frequency range of 20-300Hz) compared to the 50(60) Hz network stresses the characteristics of the applied technology meets the specification of an on-site testing system:

- Lightweight modular system,
- Compactness in relation to the output voltage,
- Low effort for system assembling,
- Low power demand, even for long cable lengths,
- Low level noises and possibility of sensitive PD detection and dissipation factor measurements.

In this contribution the newest mobile solutions for DAC field testing up to 500kV of cable lengths up to 25 - 40 km will be presented. As an innovation to the existing single side (E) HV DAC systems for energizing long lengths and for PD detection on longer cable lengths compact high power sources with an additional range extension solution will be presented, see Figure 1.

Finally, based on the field experiences as collected in the past 10 years and to support different types of on-site tests e.g. for after-laying, maintenance and diagnostics purposes, the selection of procedures will be discussed.



Figure 1: Example of a 300kV DAC test system with double side PD testing and diagnosis extender for long transmission cable circuits