

**A.8.1.****Transmission power cables partial discharge detection at damped AC voltages**

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**Abstract:** Based on the utility experiences with distribution power cables as obtained for on-site PD diagnosis this contribution discusses the generation of damped AC voltages for PD detection on HV transmission cables. In particular a new solution of DAC voltage generation up to 250kV and the possibilities of sensitive PD detection and PD site location are presented here.

**Keywords:** HV power cables, on-site PD detection

**Résumé:** Basé sur le retour d'expérience obtenu sur réseau dans le cadre de mesures de DP sur site sur câbles de distribution, ce rapport traite de la génération d'ondes de tension AC oscillantes (DAC) permettant la détection de DP sur câbles de transmission Haute Tension. En particulier une nouvelle solution de génération de tension jusqu'à 250 kV offrant la possibilité de détection et localisation de DP sensibles sont ici présentées.

**Mots clés:** Câbles HT, détection de DP sur site

**1. Introduction**

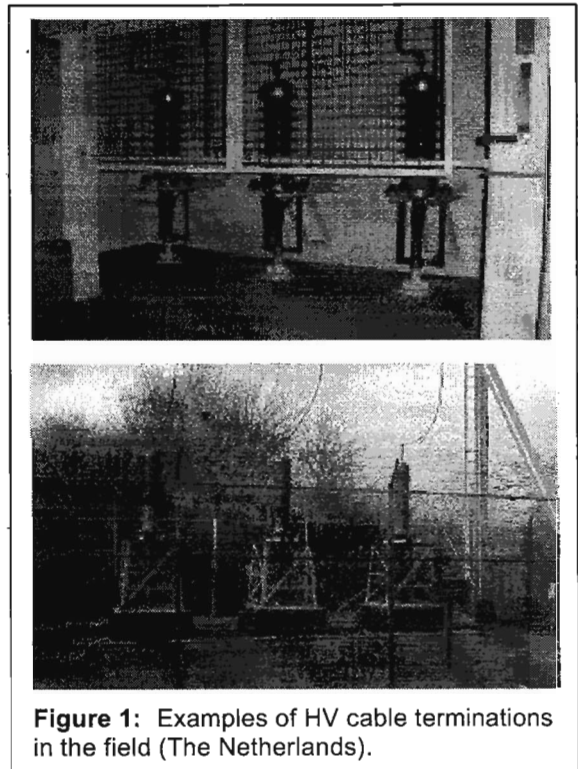
From the reliability and availability performance point of view power cables connections of the transmission network are very important assets, figure 1. It is known, that the insulation failures in a cable network may be caused by internal defects in the insulation system. To reduce the failures by internal defects, on-site cable diagnostics can be applied based on quantities related to insulation degradation, as partial discharges.

As described for power cables in [1], most of the different types of insulation defects are related to PD activity. Moreover, the high-risk sections in the power cable systems in service can be identified by the detection, localisation and recognition of partial discharges (PD) at an early stage of possible cable insulation failure.

As a result, the defective part or accessory of a cable circuit can be replaced before a failure occurs.

**2. On-Site PD Detection on HV Cables**

For the on-site detection of PD related defects in power cables, it is necessary to energise the disconnected cable sample for the ignition of the PD sources. The detection equipment is therefore directly connected to the cable conductors (or through the switchgear). In this way, the different



**Figure 1:** Examples of HV cable terminations in the field (The Netherlands).