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On-site partial discharge diagnostics of medium voltage power cables

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Resume

Ce Rapport compare deux methodes d'essai a haute voltage pour des câbles à moyenne tension, utilisant: (a) des tensions a 50 Hz CA, (b) des ondes oscillantes a haute tension. Les deux methodes detectent des décharges partielles (DP). Aussi, fondé sur les resultats de detection de DP, on traitera des aspects importants pour l'interpretation de données au regard de la determination de la condition de l'insulation électrique du câble.

Abstract

This paper compares two methods for HV on-site testing and PD analysis of in medium voltage power cables:

- (1) energizing using 50 Hz AC voltages,
- (2) charging using HV oscillating waves.

Based on results of PD detection and advanced analysis important data interpretation aspects for insulation condition determination are discussed.

INTRODUCTION

On-site after-laying tests on medium voltage power cables are increasingly important issues for power utilities. Therefore, during a limited time interval e.g. 5 minutes up to 60 minutes voltages of $1U_0$ till $2U_0$ at AC power frequencies are applied to the cable sample.

It is known from practice, that occasionally cables may breakdown despite of the fact that they have passed all withstand voltage tests. In that case such failures are mostly related to insulation defects, which occur in the cable or cable accessories. The presence of such defects even if they are discharging does not imply that a test of several minutes at enhanced voltage stress is



Figure 1: PD on-site diagnostic of a 10 kV power cable using 55 kV AC series resonance test set and an advanced PD analyzer TE 571.

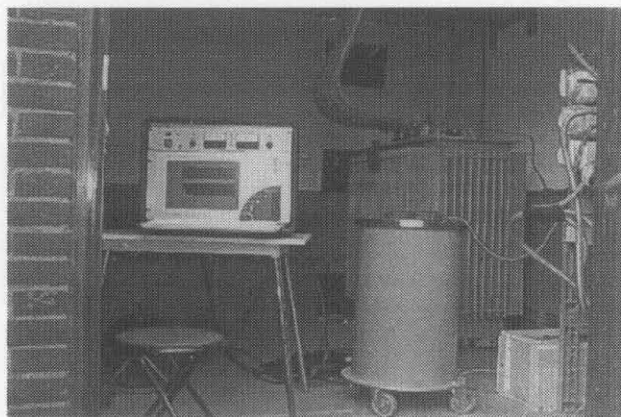


Figure 2: PD on-site diagnostic of a 10 kV power cable using oscillating wave test system (OWTS®).