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The Cenelec long term test for XLPE MV cables – Everything new and different ?

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Abstract: More than 10 years ago wet long term tests were introduced in numerous European countries - in Germany the so-called "VDE-Test" - as a main qualification procedure for XLPE-MV cables. The results were not directly comparable due to different test regimes. This situation became more and more an obstruction of the growing European market and a main driver towards a harmonised test which was agreed in CENELEC TC20 in 1999 and introduced in the VDE approbation procedure in December 2000. Today the first results after 2 years ageing are available for a comparison with the history to assess the efficiency of the new test regime and the continuity of the results with the goal of maintaining the actual cable quality level.

Keywords: XLPE cable, wet ageing, long term test, VDE test, CENELEC test

Résumé: Les essais en milieu humide ont été introduits dans plusieurs pays européens depuis plus de 10 ans pour qualifier les câbles MT XLPE - par exemple le fameux test VDE en Allemagne. Les résultats n'étaient pas directement comparables en raison de conditions d'essais différentes. C'est devenu un élément de blocage vers un marché européen ouvert, et la raison principale pour développer un essai harmonisé que le CENELEC TC20 a accepté en 1999. Il fut intégré dans la procédure d'approbation VDE en décembre 2000. Les premiers résultats après 2 ans de vieillissement sont maintenant disponibles, et une comparaison est possible avec l'ancien test pour vérifier l'efficacité du nouveau procédé et assurer la continuité des mesures visant à garantir le niveau de qualité actuel des câbles.

Mots clés: câbles XLPE, vieillissement en milieu humide, essais, VDE, CENELEC

1. Introduction

Based on the partially bad experience with PE and XLPE insulated medium voltage cables of the first generation produced in the seventies, multiple activities were initiated in co-operation between users and manufacturers to improve mainly their wet ageing properties.

The results of these comprehensive investigations led among others to modifications of the plastic materials, an optimisation of the production process and the improvement of the cable design.

A major question was, how to prove the long-term properties of an extruded MV cable in a test, which can be realised with reasonable technical and economical efforts. Numerous trials using model configurations led to a much better understanding of the physical and chemical ageing processes but could not satisfy the needs of the cable society because the specific results did only weakly correlate with the results gained on cables. The cable users and manufacturers had to accept that an effective and efficient test procedure could only be based on full-size cables under accelerating conditions (see Fig.1) [1].

In the early nineties in most European countries wet long term tests with different sets of test parameters

were established as part of the national or customer specific qualification procedure for XLPE MV cables.

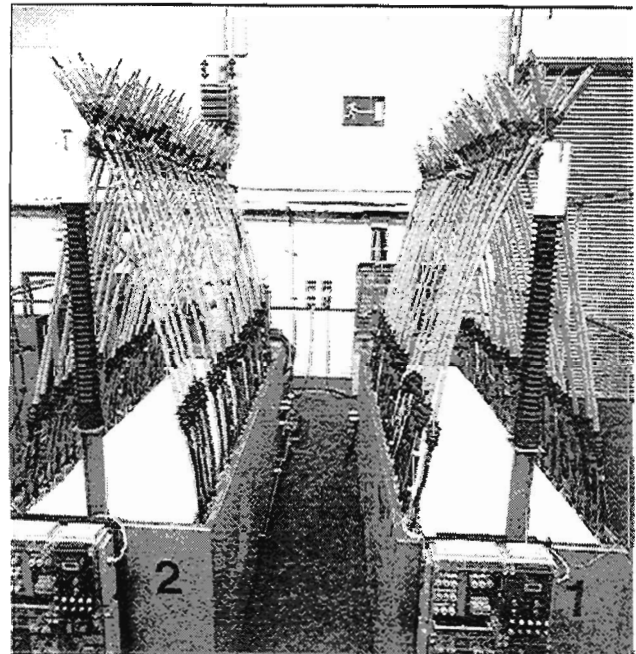


Fig. 1: Typical long-term ageing test lab with MV-cable samples in water tanks