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The CENELEC long term test for XLPE MV cables - everything new and different?

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Based on the partially bad expierience with PE and XLPE insulated medium voltage cables of the first generation produced in the seventies of last century, multiple activities were initiated in co-operation between users and manufacturers to improve mainly the wet ageing properties. The results of this 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 and is still today, 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 can obviously only be based on full-size cables under accelerating conditions. 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.

The so-called "VDE Long-Term-Test" became in Germany part of the VDE homologation as a type test and in a regular production monitoring procedure to evaluate changes in the quality level of a manufacturing site. After years of experience and exchange of test results all participants in the MV cable market were convinced to have a powerful tool for the assessment of the cable long term properties.

Different tests in different countries became however more and more an obstruction of the growing European market what was the main driver towards the harmonised test, worked out by the CENELEC TC20 WG9 Task Force "Long Duration Test" which was proposed in 1999. The change of the test procedures in Germany was agreed to happen in December 1999.

The primary concern connected to this decision is certainly the question of continuity of the long term tests to maintain the actual cable quality level. Due to the new combination of test parameters nobody could predict precisely the results regarding the level of the residual electrical strength, the dynamics of ageing, the scattering range, the potential of differentiation etc.

Therefore only the test procedure was introduced into the HD 605. The final requirements for the test results are still under consideration, an orientating proposal was made by the Task Force. In the meantime the first sample collectives have past the 2 years of ageing. Uncertainties can now be eliminated, old and new test procedures can be compared.

In this paper the available test results of Nexans Germany are presented, the level and structure of the results are evaluated and some principle matters regarding a future harmonised evaluation procedure are discussed.