

**B5.1****Diagnosis of service aged XLPE cables. Presentation of a nordic utility research project evaluating different on-site dielectric response diagnostic test methods**

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This paper will describe a large Nordic research project where the aim is to study the possibilities of different non-destructive cable diagnostic techniques that are commercially available for the utilities. The diagnostic tests are all developed to help the utilities in locating poor cables in their network.

Ageing of XLPE cables in medium voltage XLPE cables (12 and 24 kV) is in most cases related to water treeing. All the commercial non-destructive techniques evaluated in this project are developed for the purpose of on-site water tree detection.

Water treeing in old generations of XLPE cables is well known. However, water tree growth in more modern types of XLPE cables is not yet widely experienced. It has been observed that the water trees in most cases have a much lower density in the newer cable constructions. This may result in limitations for the dielectric response tests.

It is also known that there are differences in the evaluation principles of the commercial test methods. This may implicate differences in performance. This will be discussed in the paper.

In one of the countries a large field test is to be performed. Seven cable constructions from several cable generations are included. Tests have been performed with five different measuring techniques. After the non-destructive dielectric response tests are finished, all cables are to be taken out of service and brought to the laboratory for destructive laboratory AC breakdown tests and microscopy examination for water trees. Results from these tests will be presented in the paper.