Since 2001, a series of diagnostic measurements has been carried out on in total 58 dry cured XLPE cable sections installed in 10 to 20 kV networks the period between 1979 and 1996. The objective of these measurements was to get an assessment of the insulation condition and if possible the rate of change in insulation condition for these cable sections.

The method used for the measurements was dielectric spectroscopy where the dielectric losses in the insulation were measured at VLF voltages in the range between 0.5 \( U_0 \) and 1.5 \( U_0 \) in the frequency range around 0.1 Hz.

The measurements have shown that 50 % of the cables are still in good condition. 25 % show signs of slight ageing and around 23 % are significantly aged. One cable (around 2 %) was found to have bad insulation condition with high risk of failure in the case of an overvoltage occurring on the system.

In the 6-year project period the insulation condition was found to deteriorate for 40 % of the cables. The greatest change was observed for a cable installed in 1983. In 2001 this cable was found to be in good condition but in 2007 it showed signs of long water trees.

Of the tested cable sections at least 35 % had damaged sheaths. From the measurements, the insulation conditions for cables with intact sheaths are not significantly better than for cables with damaged sheaths.

Further measurements on the cables are planned for the coming years.