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### B.1.6.

20 years of experience with copolymer power cable insulation

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Copolymer modified crosslinkable polyethylene for power cable insulation was introduced early 1980's. This compound concept was developed to overcome the high failure rate of polyethylene insulated cables reported in the late 1970's in countries like USA and Germany. The origin of this high failure rate was attributed to poor cable construction and inadequate installation practices leading to extensive water tree degradation of the first generation insulations.

The copolymer XLPE concept has over the years evolved in formulation optimisation and compound quality to become a robust technology meeting today's industry requirements of electrical performance and processing economics. This material family is now the preferred power cable insulation technology in MV bonded cable constructions.

The paper reviews

- the different development phases of the copolymer technology from the origin to today's solution
- the improvements in product handling, quality and processing properties that have been realised over the years to meet the needs of modern large cable lines
- the electrical performance of the copolymer technology versus the standard homopolymer materials both in laboratory tests and field experience
- the evolution of the use of XLPE copolymer technology since its first introduction 20 years ago.