# On line diagnosis experimentations for MV cables in ERDF distribution network

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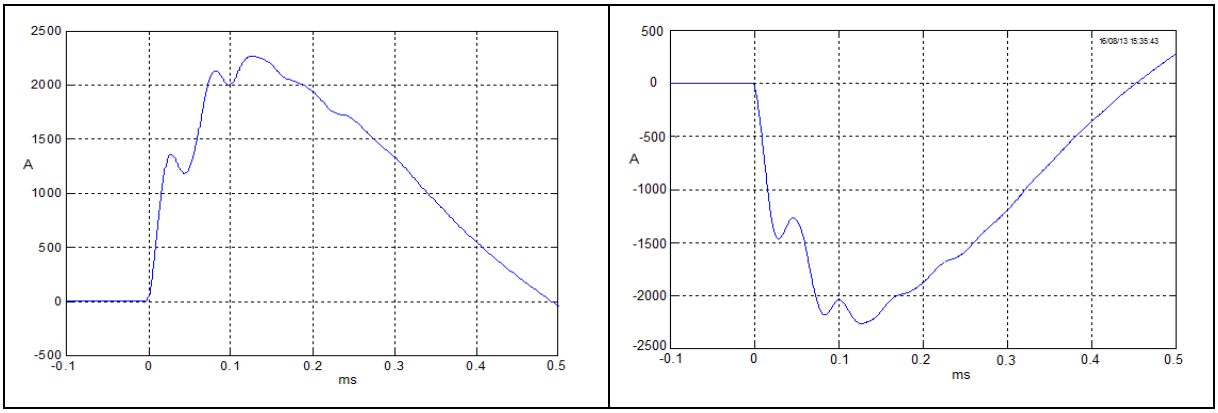
Since 2012 ERDF experiments on line diagnosis systems for its MV underground cables distribution network. Four diagnosis systems have been installed in 4 source substations in order to record the different transients which affect the network and to identify among them the "pre-faults" also known as "self-extinguishing" single phase faults.

The specific diagnosis systems have been designed to record power frequency phenomenon but also high frequency phenomenon in order to investigate solutions for the localization of the pre-fault on the underground cable network.

The high number of measurements taken from the diagnostic systems permitted to analyze many pre-faults and faults records and to establish correlations between some self-extinguishing faults and persistent faults.

The final goal of the on line diagnostic system is the prevention of future failures. In order to reach that objective, the fault location has to be performed. Thanks to the high sampling rate of the data acquisition systems, locations of fault have been done successfully in some cases using the high frequency records of cable screen currents measurement.

The return of experience of these investigations and the help of simulation showed that the fault location still remain a challenge with long cable lengths, the presence of cable derivation and the variation of the fault resistance.




**a) b) On site measurements of cable screen currents vs time on a faulty feeder**

a) Cable screen current measured on a single phase "self extinguishing fault".
b) Same cable screen current measured one month later on a persistent cable fault.

**Key words :** On line diagnosis; self-extinguishing faults; faults location.