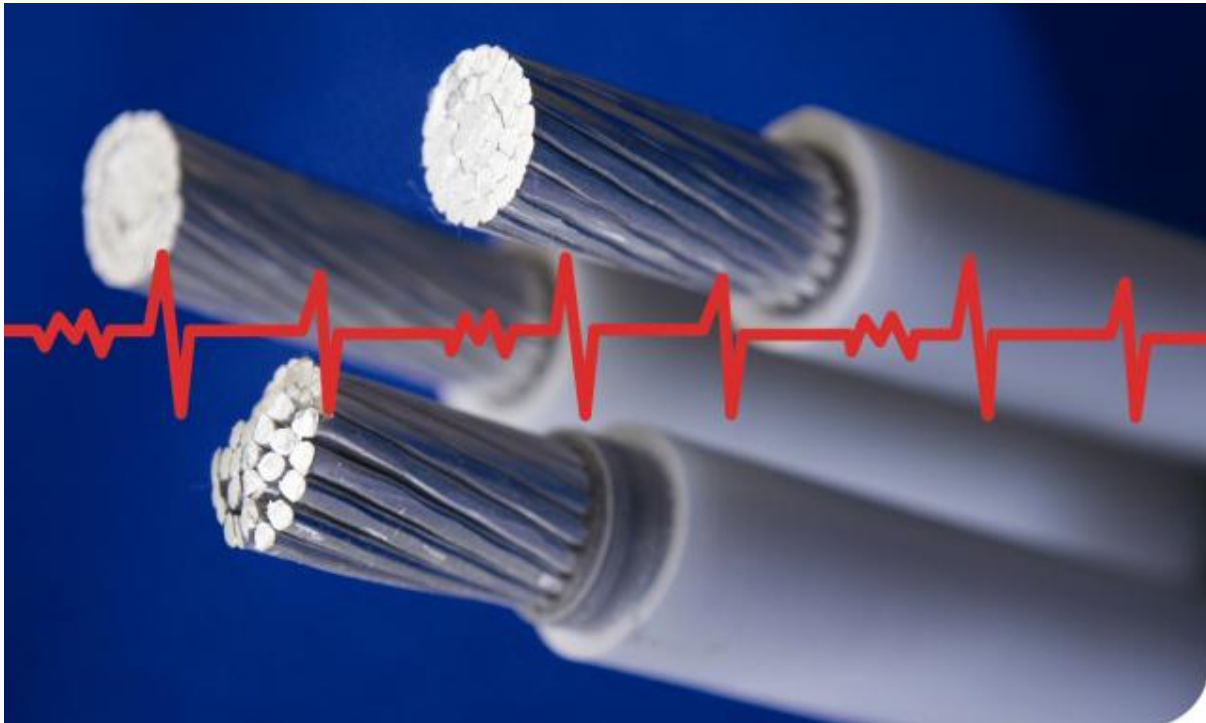


On-line Partial Discharge Monitoring for MV Cables with SCG

Practical Experiences in the Period 2007 to 2010



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ABSTRACT

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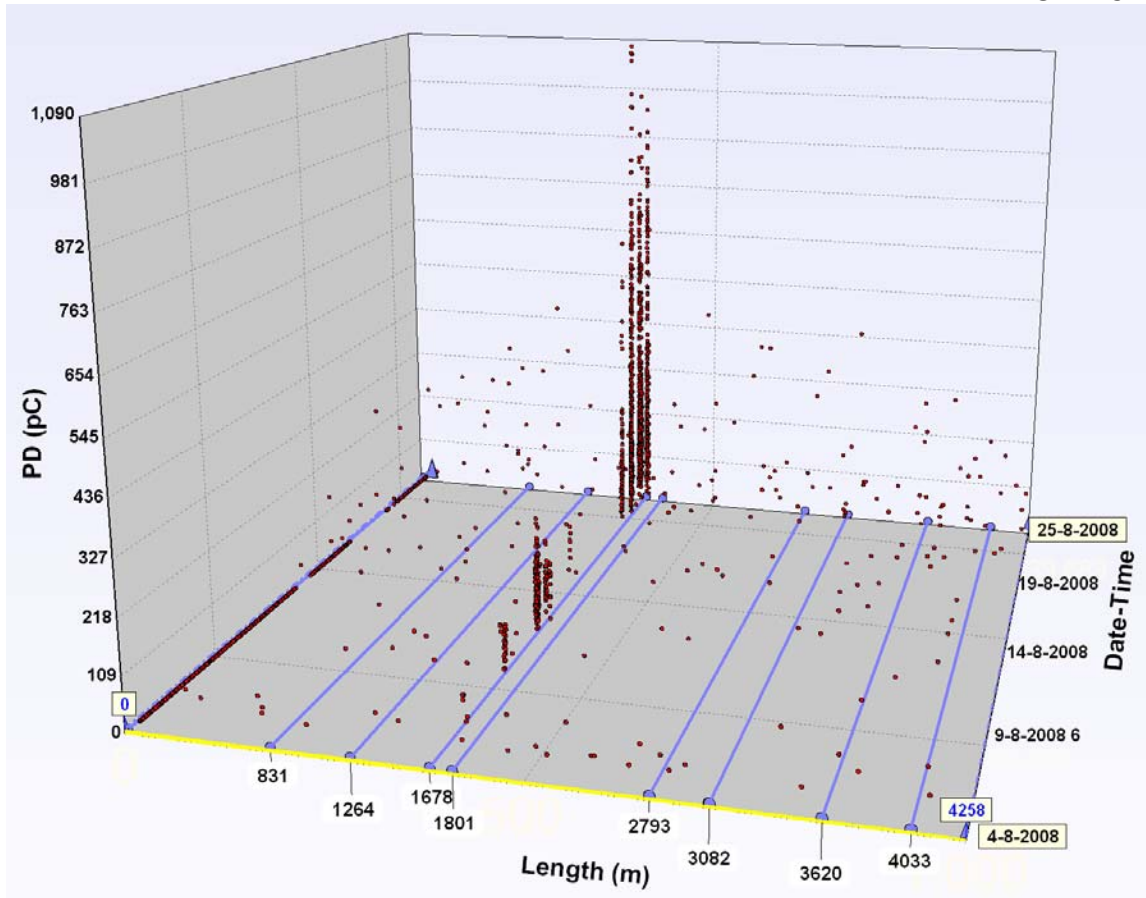
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Since 2007, there is a method with which over a long time (years if needed) partial discharges can be monitored AND LOCATED in medium voltage power cables. Any type of cable (PILC, XLPE) can be monitored up to lengths of 8 km, also in a mix and even with ring main units in the total length monitored. This monitoring technique is called Smart Cable Guard (SCG, formally called PD-OL) and it is now being applied to many different cable circuits by about ten different network owners. This paper summarizes the network owner experiences obtained with SCG. Some important findings give insight in the efficiency of SCG and also in the best way to perform the monitoring, i.e. the optimal monitoring schedule. As said, this paper is focusing on experiences obtained with SCG. The background of SCG, like its measuring principles and its role in Smart Grids, is explained in another Jicable 2011 paper.

A very important advantage of measuring on-line over a long time is the possibility to see the PD development of a defect almost until the actual moment of failure. For experimental reasons in a few cases, the PD's were even allowed to develop until the actual breakdown. This is unique, in literature, such information is hardly being found and very informative.

The PD behavior is strongly depending on the type of defect, as expected. For instance, PD's from PILC accessories are often irregular in intensity and might stay for months or longer. But there are also typical defects where the breakdown is preceded by growing PD activity over a period of only a few days (an example is shown in the picture), just enough to give a network owner the opportunity to replace the defective part.



There were even a few defects that gave a breakdown where there was no PD activity measured at all preceding the breakdown. Altogether, it could be shown that in more than 80% of the cases SCG was able to give a warning in time. With that the efficiency of SCG can be considered to be better than 80 %. This is based on 31 defects located with SCG. The paper will identify all defects seen so far and some interesting examples will be given, including the PD pattern over time (such as shown in the picture above) and photo's of the actual defects that caused these PD's.