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The analysis of the Partial discharge pattern of the Artificial defects at the interfaces of XLPE cable joint using laboratory model

J.S.Lee*, J.T.Kim**, J.Y.Koo*
Eng. building #3-218, hanyang university, 1271, sa-1 dong, Ansan, Kyunggi-do, 425-791, KOREA
TEL: 82-031-400-5163
Fax: 82-031-407-9873
jslee1@ihanyang.ac.kr / jykoo@hanyang.ac.kr
* Department of electrical engineering in hanyang university
** Department of electrical engineering in Daejin university

Even though the cable joint assembling is made very carefully by workers at the site, various nature of contaminants could be easily introduced at the interfaces where the partial discharges are known to be produced resulting in the interfacial electrical tree which give rise to sudden breakdown, and then unexpected service failure of the transmission cable system.

In this respect, it is preferable to identify the possible nature of defects and to recognize the present state of degradation of XLPE cable joint by measuring PD inception voltage and analyzing their PD patterns.

In this work, in order to realize the possible defects at the cable joint interface, four different types of artificial defects are provided such as metal, semi conducting, insulating substances and void. And the analysis related to the PD patterns has been performed by means of Phase Resolved Partial Discharge Analysis (PRPDA) and Chaotic Analysis of Partial Discharge (CAPD). The latter has been proposed by our previous communication.

As results, it could be pointed out that each defect has shown particular characteristics in its pattern respectively and that the nature of defect causing partial discharge could be identified more distinctively when the CAPD is combined with traditional statistical method, PRPDA.