B.2.5. Câbles MT à isolations polyéthylène et PR : retour d'expérience et expertise de l'état de l'isolation

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Resume

Le rapport fait une analyse statistique des défauts qui ont eu lieu dans les lignes électriques en câbles ŕ isolation extrudée de moyenne tension. Les études effectuées concernaient l'isolation polyéthylene et PR câbles. On a observé de structure de polyéthylene pendant l'analyse en spectrophotométrie l'infrarouge (IR et IRTF).

B.2.5. PE and XLPE medium voltage cables - Service experience and examination of insulation state

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Abstract

The PE and XLPE insulation from failured field-aged cables had been examined. The investigations based on IR and FTIR have been carried out for a cable insulation. On the basis of collected data from a service experiences for MV cables in Poland it is done a some statistical analysis.

INTRODUCTION

It has been over 90 years since the world's first medium voltage cable with paper insulation was put into commercial operation. The great part of those cables work without failure during several decades. On the other hand, a service experience concerning power cables with polyethylene insulation is not so long as in a case of cables with traditional insulation. It does not mean that expected service time without failure is shorter. The first medium voltage low density polyethylene (LDPE) insulated cables have been used for distribution system for over 40 years. Crosslinked polyethylene insulation in medium voltage cables has been used since 1964.

It is known that an XLPE insulation is better than polyethylene one, but many factories still produce cables with a PE insulation. In Poland, up to 1988, the cables with polyethylene insulation were produced only. Therefore a great part of cable lines is based on this type of cables. So, an aging problem and a diagnostic of degradation of PE cable insulation is still actual. Now, in Poland the XLPE cables, often called as "dry-solid" type, are mostly produced. The future of an XLPE insulation is connected with a possibility of determination of deterioration reasons which can be observed in service conditions [1,2]

MV POLYMERIC CABLE FAULT STATISTICS

Figure 1 shows the percentage contribution of paper impregnated cables (PAP), polyethylene cables (PE) and crosslinked polyethylene cables (XLPE) in a total length of cables lines operated by all power distribution companies in Poland. A length of underground medium voltage cables operated by distribution companies is more than 30 thousands km. A statistical analysis is based on data collected for Polish Power Transmission and Distribution Association.