

**B5.2****Evaluation of different diagnostic methods for the french underground MV network**

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Summary

Medium Voltage cable diagnostic has always been a major challenge for most utilities which have reliability concerns about their ageing underground networks. Even though a quite reliable synthetic MV cable design has been adopted in France 20 years ago, EDF has nevertheless decided to investigate available non-destructive diagnostic techniques for its MV network in order to possibly anticipate new needs of customers. The first results show that cables do not present real ageing problems, which therefore let the defective accessories to be more easily detected.

Résumé

Le diagnostic des liaisons électriques moyenne tension a toujours été un défi pour les exploitants qui ont des problèmes de fiabilité avec le vieillissement de leurs réseaux souterrains. Bien qu'un nouveau câble MT ait été adopté en France il y a 20 ans, EDF a néanmoins décidé de s'intéresser aux techniques de diagnostic non destructives existantes pour anticiper le cas échéant les nouveaux besoins des clients. Les premiers résultats montrent qu'à l'heure actuelle les câbles ne présentent pas de problème de vieillissement, ce qui permet une détection plus facile des accessoires défectueux.

1 - Introduction

In the mid 70's, it has been decided to study and develop a new XLPE cable technology which was supposed to avoid major water-treeing problems that the previous HN 33-S-22 non-watertight cable generation started to generate.

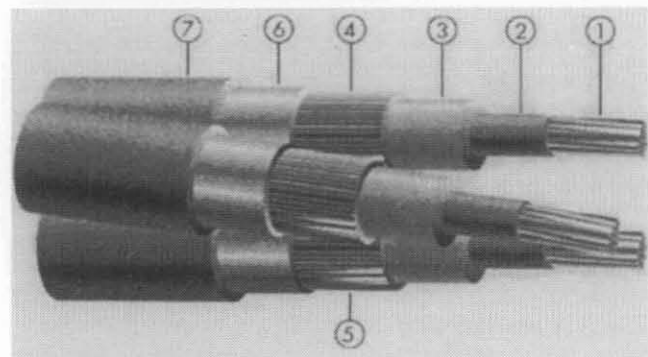
At the beginning of the 80's, studies came out with a new design which universally innovated with an overlapped laminated aluminium sheath glued to the external PVC jacket during extrusion (figure 1). Since then, the same XLPE cable has been successfully used (NFC 33-223, 12/20 kV).

In the meantime, accessories such as joints or terminations have been drastically improved to now combine, for instance with cold-shrinkable technology, reliability and mounting rapidity.

Results of these evolutions can now be exposed : no heavy researches and developments in diagnostic have been down because of low MV synthetics cables failure rates due to the cable watertight aluminium barrier, and oldest paper insulated cables systematic replacement.

Aware of customers new needs in better services, it has nevertheless been decided to evaluate market

available non-destructive diagnostic techniques for synthetic MV electrical links.



- 1 - stranded aluminium conductor mainly 95, 150 and 240 mm²
- 2 - extruded semi-conductor screen
- 3 - extruded 5.5 mm thick XLPE insulation
- 4 - extruded semi-conductor screen, strippable and longitudinally grooved
- 5 - hygroscopic powder
- 6 - 0.2 mm thick laminated aluminium screen
- 7 - 3 mm thick PVC outer jacket

Figure 1 : The French MV XLPE cable