CIGRE Study Committee B1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

WG N° B1.58	**Name of Convenor :** Slawomir Noske (PL) **E-mail address** : slawomir.noske@energa.pl	
Technical Issues # (2): 1 & 2		**Strategic Directions # 2 : 1 & 2**
The WG applies to distribution networks (4): Yes		
Title of the Group: Condition Assessment and Diagnostic Methods to support Asset Management of MV Cable Networks		

Scope, deliverables and proposed time schedule of the Group :

Background :

MV power cable network are one of the most important parts of distribution power systems. The oldest parts of cable networks consist of belted paper insulation lead covered (PILC) cables and Polyethylene (PE) insulated cables. Since the 1970's, cross linked polyethylene (XLPE) insulated cables have supplanted the older designs. MV cable networks are increasingly complex systems of interconnected cables that are regularly modified. As a result, cable circuits often consist of a range of cable, joint and termination designs. Consequently, the active aging processes exhibited by individual cable sections and accessories may be at different stages.

To effectively manage the cable network, a detailed knowledge of the technical condition of individual circuit elements (cable segments, joints, terminations) is necessary. In addition to the understanding of the current network condition, effective methods to quality-assess both installation and repair works to cable circuits is required as this has been identified as a significant threat to the health of modern distribution networks. Many novel diagnostic methods have been proposed for MV cable systems over the last few decades. They are being used increasingly in MV cable network. Modern systems allow network operators to record and analyze measurements in the field.

The new diagnostic methods can be a source of information about the condition of all cable network elements and provide better information about condition of cable circuits after installation. This information is very important to the development of asset management this part of network.

Two of the primary measurement techniques are partial discharge (PD) and tan delta. Both of these techniques generate information about the technical condition of insulation. PD analysis facilitates the ability to measure parameters from individual sections of both cables and accessories.

A number of individual distribution companies have gained sufficient practical knowledge to effectively use these diagnostic results to inform maintenance and operational decisions.

The outputs of the Working Group should be: to indicate the directions of MV cable asset management development; to indicate development of diagnostics techniques and associated challenges and to begin the standardization of diagnostic techniques across a broader range of stakeholders.

Scope :

The scope shall cover the following topics:

1. Asset management standards (include ISO 55000) and best-practice methods in MV cable network
2. Diagnostic methods used in MV cable network and their economic impact
3. Cable diagnostics standards and requirements in electrical tests after both installation and repair work
4. Diagnostics in assessing technical condition of cable circuits.
5. Management of data received from diagnostic tests
6. Summary of the experience in development of asset management and diagnosis methods, analysis of development trends.

Deliverables : Technical brochure with summary report in Electra, tutorial

Time Schedule: Start : 2017 **Final report** : 2019

Approval by Technical Committee Chairman : M. Waldron
Date : 06/02/2017

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2
(4) Delete as appropriate

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (cf. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non technical audience