CIGRE Study Committee B3

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG N° B3.24	**Name of Convener:** Mark Reuter (GERMANY) **E-mail address**: mark.reuter@siemens.com
Technical Issues # (2): 8	**Strategic Directions # (3): 2**
The WG applies to distribution networks (4): No	
Title of the Group: Benefits of PD diagnosis on GIS condition assessment	

Scope, deliverables and proposed time schedule of the Group :

Background :

The application of methods for the condition assessment of gas-insulated switchgear (GIS) has become even more important with economic and network drivers requiring users to extend the service life of their equipment and to optimise operation and maintenance. To support these objectives, partial discharge monitoring (PDM) systems can provide necessary information during their continuous operation, supporting decision-making regarding any intervention prolonging life or ensuring the serviceability of the equipment. The application of either periodic or discrete partial discharge measurements can provide information in terms of condition assessment of GIS. However the use of these methods and the interpretation of the results are not completely standardised (e.g. non-conventional PD measurements), and the related recommendations derived from the results vary. Current work of SC D1 (WG D1.03 (TF09), WG D1.25, and WG D1.37) analyses the latest developments in this area. However the benefit of PD diagnosis (monitoring or diagnostics) is sometimes not tangible for users. The results of this work will help the asset manager to optimize the allocation of their operational expenditure to prevent major failures, minimize planned outages and thus increase network reliability and availability.

Scope :

The aim of this work is:

1. To identify which type of PD diagnosis can realize which advantage for users under consideration of various aspects (e.g. new/old GIS installations, refurbishments, extensions, life cycle management, outage planning, etc.),
2. To analyse the requirements for reliable results from risk assessments associated with PD diagnosis (e.g. in house experts and/or expert systems), and for realization of derived measures thereof,
3. To evaluate the impact of life expectancy, replacement/maintenance approaches, data structures, evaluation and upgrades on a total cost analysis of a PD diagnosis system,
4. To investigate the merits of PD diagnosis for optimising spare part and redundancy policies and comparing effectiveness against other diagnostic techniques e.g. SF_6 analysis, etc.,
5. To elaborate pros and cons to achieve tangible benefits from a PD diagnosis system which can be quantified to justify an investment decision,
6. To provide a survey of case studies showing the path from the decision-making process of a PD diagnosis application to real benefit if any (users' input is imperative for this work).

Deliverables: The work will be finalized with a brochure and a short report in ELECTRA.
Time Schedule : start : June 2012 **Final report** : 2015

Comments from Chairmen of SCs concerned :

Approval by Technical Committee Chairman : Klaus Fröhlich
Date :16/06/2012

(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	Interactive communication with the public and with political decision maker