CIGRE Study Committee A2
PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

WG N° A2.49	**Name of Convenor :** Peter Cole (AU) **E-mail address**: pcole@ausgrid.com.au
Technical Issues # (2): 8	**Strategic Directions # (3): 2**

The WG applies to distribution networks (4): Yes

Title of the Group: Condition Assessment of Power Transformers

Scope, deliverables and proposed time schedule of the Group :

Background :

Transformer health indices may be used for a variety of transformer management purposes where an understanding of the overall condition of each power transformer in a fleet is required. For example, they may be used to assist asset owners to determine if major maintenance work is justified. They may also be used to prioritise or justify repair or replacement decisions, or may be used to determine the requirement for spare transformers.

This working group will look at the information used to derive transformer health indices, the way that information is consolidated and the uses to which transformer health indices are put. Consideration will also be given to the transformer health indices scales and whether a common method of stating transformer asset condition could be put forward for future comparison and benchmarking between operators.

Scope :

The working group will:

- Review existing CIGRE documents and other literature that relate to this subject; such as those related to testing and diagnostics. Where appropriate, these documents would be referenced in the Technical Brochure;
- Determine what parameters of a power transformer need to be determined in order to fully assess the condition. This would include the condition of the main part of the transformer – as well as the condition of ancillary components (eg bushings, tap changers, instruments etc). Known design deficiencies could also be considered, and consideration will also be given to safety and environmental issues which may limit the transformer's useful life;
- Determine which of the parameters needs to be assessed individually to determine if urgent corrective action is needed (eg OIP bushings in poor condition may require immediate attention, regardless of the overall condition of the transformer);
- Determine how these parameters can be combined to determine the overall condition of the power transformer, and to determine how weightings can be assigned to the various parameters to develop a health index. Consideration should be given to both deterministic and probabilistic methods.
- Consider what other information may need to be considered in conjunction with the health index to make asset management decisions. For example criticality, performance, utilization, obsolescence etc.
- Determine how the health index and other critical information can be used to prioritise condition based maintenance replacement, or to make other asset management decisions.
- Provide details of health indexes or condition assessment tools currently in use, and provide examples of how they can be applied.

Deliverables : Brochure, ELECTRA. Publication and workshop

Time Schedule : start : Fall 2012 **Final report** : 2015

Comments from Chairmen of SCs concerned :

Approval by Technical Committee Chairman : M. Waldron

Date : 18/12/12

(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