



## Working Group Form

<b>WG N°: A2.44</b>	<b>Name of convenor: Carlos Julio Dupont, BR</b>
<b>Title of working group:</b> Transformer Intelligent Condition Monitoring	
<b>Context</b> <p>The use of off-line and on-line monitoring and diagnostics systems associated with power transformers is increasing in the energy utilities. Some lack of standardization and doubts related with the reliability and benefits that can be obtained with these systems are making the technology consolidation difficult. The subject needs, in fact, to consider some complementary approaches.</p> <ul style="list-style-type: none"><li>- <u>Economical</u>: The economical part was dealt by CIGRÉ brochure #248 (WG A2.20) and all the utilities seem now to be able to apply economical models to decide where monitoring could be the most worth doing.</li><li>- <u>Specification</u>: The transformers could be specified and supplied well prepared with couplers for future use of on-line sensors/monitors. This was addressed by CIGRÉ brochure #343 (WG A2.27).</li><li>- <u>Hardware</u>: Standardized data communication protocols (for instance IEC 61850) could allow for the interoperability of IEDs and for their easier future evolution / upgrade. The standardized specification of values to be monitored, diagnostic methods and model calculations to be provided by the monitor should be addressed. Basic standard properties and functions of a transformer monitoring system should be defined accordingly.</li><li>- <u>Software and information technology</u>: The systems could follow the requirements for open systems as indicated by CIGRÉ brochure #298 (WG A2.23) use a standard way to proceed with the historical input data currently accumulated on hard drives (including previous testing history, performed maintenance events, etc) and use a standard way to indicate / rank the condition of the transformers (for example using per unit indexes or green, yellow, orange and red lights as defects / abnormalities indicators).</li></ul> <p>No single approach seems to be enough to ensure the future success of transformers monitoring and the benefits only fully appear if the companies reach an adequate maturity level for its intelligent use and if the above mentioned points are put together.</p> <b>Scope and aim</b> <p>The market now offers plenty of sensors and monitoring systems but there is no consensus on how to manage, process and convert data to relevant information. The objective of this WG is basically to explore the aspects related with the treatment of transformers off-line / on-line / periodic / continuous data, the conversion of data to relevant information, the identification of the most appropriate diagnostics algorithms and its specification on "standard and interoperable diagnostics modules". In this context, the focus of the proposed WG is to pursue:</p> <ul style="list-style-type: none"><li>- Improvement of the transformer monitoring and diagnosis use by the identification of best practices;</li><li>- Demonstration of benefits that can be obtained by the application of monitoring and by a standardization and harmonization of the diagnostics methodologies;</li><li>- Indication of the monitoring hardware and/or software design aspects that are important to future data integration and transformer condition assessment benefits.</li></ul> <p>This effort will need the cooperation among transformers users, manufacturers and researchers. Interaction with IEC groups, like the one preparing the IEC 61850 for condition monitoring diagnosis and analysis (IEC 61850-90-3), and CIGRE WG B3.12 – Obtaining Value from On-line Substation Condition Monitoring.</p> <p>The final results could be useful for manufacturers and utilities by helping them to adjust their projects, processes and specifications to better practices, to improve their asset management techniques by the large scale use of integrated information systems, and to define the most adequate politics regarding the use of existing and new monitoring systems.</p>	
<b>Deliverables/time schedule</b> <ul style="list-style-type: none"><li>- January 2011: Starting of the working group</li><li>- End of 2013: Interim Report for Electra</li><li>- Paris session 2014: Final report (Brochure and Tutorial)</li></ul>	

**Papers issued: TB, Summary in Electra**

**Approved by TC chairman: Klaus Fröhlich**

**Date: 15/12/2010**