



## WORKING GROUP FORM

**Study Committee: A2**

<b>WG A2.45</b>	<b>Name of Convener: Christoph Kuen, DE</b>
<b>Title: Transformer failure investigation and post-mortem analysis</b>	
<b>Terms of Reference</b>	
<b>Background:</b>	
<p>Transformer and shunt reactor are known as a very reliable apparatus. Nevertheless, a major failure is possible at any age due to many factors as incorrect specification or operation, design or manufacturing errors, bad maintenance, excessive ageing, etc. Moreover, as a significant number of transformers and shunt reactors in service are reaching or have already exceeded their expected end of life, several preventive scrapping are performed. When a failure occurs, it is very important to collect all relevant information about the failure and make as much observations as possible on the failed transformer and shunt reactor in order to identify failure causes.</p> <p>There is no standardised structured procedure to describe what observations have to be performed outside and inside the transformer and shunt reactor and on which components, which sequence of measurements are important to deliver informative results, how to proceed for sampling solid insulation and where these samples have to be taken, what are the design information to consider, etc. Such analysis can be used, in particular, to calibrate diagnostic techniques and evaluations, and ageing kinetic formulas suggested in standards and literature.</p>	
<b>Scope:</b>	
<p>This WG will develop a structured procedure from the decision to take the transformer and shunt reactor out of service to careful dismantling. The main following activities will be covered by this WG:</p> <ul style="list-style-type: none"><li>• State of the art of post mortem analysis (IEEE C57.125-1991 and any other relevant existing documents)</li><li>• How to make an external and internal inspection of different components</li><li>• Important information to collect: diagnostics, protection, operation and maintenance records, etc.</li><li>• Availability and significance of design data, material used, etc.</li><li>• Documentation during the dismantling, check lists</li><li>• Additional checks, e. g. clamping pressure, ...</li><li>• Paper sampling: precautions, which winding, axial / radial position, correlation with temperature, number of samples, conservation and storage of the samples, parameters to be investigated (Task Force to be led by SC D1)</li><li>• Collection of pictures of post-mortem analyses with examples of common failures and the associated failure investigation</li><li>• Best practices for failure report and scrapping report</li><li>• Economic aspect of post-mortem analysis (cost, value, constraints, etc.)</li></ul>	
<b>Deliverables and time schedule:</b>	
<ul style="list-style-type: none"><li>• End of 2012: Interim report in Electra on solid insulation sampling procedure</li><li>• End of 2014: Brochure and Workshop</li></ul>	
<b>SCs / Target Groups concerned: SC D1</b>	
<b>Approval by TC Chairman: Klaus Fröhlich</b>	<b>Date:21/06/2011</b>

