



Study Committee No: A3

WORKING BODY FORM

Group No : A3.24	Name of Convener : Martin Kriegel
TITLE of the Group : Tools for Simulating Internal Arc and Current Withstand Testing	
1 BACKGROUND Recognizing an increasing role of commercial modelling software in the power industry, Study Committee A3 established WG A3.20 to evaluate existing simulation tools and the extent to which they can be used as verification tools. Using a case study based on dielectric design, WG A3.20 concluded that simulation is a valuable development tool, can accurately predict stresses and can provide good performance extrapolation where test data is available on similar designs (interpolation). The scope for “pure” performance prediction remains limited. Two further study cases were identified by WG A3.20 where detailed analysis of the available study techniques could lead to real benefits in terms of reduced, or modified, testing regimes.	
2 SCOPE OF WORKING GROUP A new Working Group, building upon the activities of WG A3.20 is proposed. The new WG will continue the analysis of the use of simulation as verification tools with a specific focus on two study cases where potential benefits are foreseen; internal arc testing of SF ₆ filled equipment and temperature rise type testing. The analysis of techniques for simulating internal arc performance will investigate the possibility of accurately predicting the outcome of SF ₆ internal arc tests based on test data from internal arc tests in air and of using such tools to reduce the number of internal arc tests required. If successful, this would provide a basis for revised standard test procedures which minimised the release of SF ₆ gas and by products and hence delivered environmental and safety improvements. The analysis of temperature rise behaviour of substation equipment is an appropriate topic for simulation since the temperature limits are directly specified by the standards i.e. it is a problem of stress modelling rather than performance prediction. It is thought that temperature rise can be simulated relatively straight-forwardly by software tools and the WG will attempt to define best practice for simulations considering: <ul style="list-style-type: none">• type of product (bus bars, circuit breakers, GIS components etc)• parameters and conditions (power frequency, current range, temporary overload)• analysis and validation of tests with respect to a benchmark which will be developed by the WG IEC and IEEE standards could benefit from the use of simulation tools and the WG plans to provide guidelines how to use them to validate test results and/or minimise testing.	
3 PAPERS ISSUED BY PRECEDING WG (A3.20) Electra No. 234, pp. 13-18, October 2007 Cigre Conference, paper A3-210, 2008	
4 TIME SCHEDULE AND DELIVERABLES The working group is planned to complete the work within 3 years. A Technical brochure & ELECTRA summary will be delivered summarising the work of both WG’s (A3.20 and this one). Tutorials and/or workshops will be organized as required.	
Approval by TC Chairman : Klaus Fröhlich	Date :20/05/2008