



## Cigré Study Committee A3 - High Voltage Equipment

### Proposal for the creation of a new Working Group

**WG:** A3.29

**Proposed Convenor:** A. MAHESHWARI (AU)

**Working Group title: DETERIORATION OF AGEING SUBSTATION EQUIPMENT AND POSSIBLE MITIGATION TECHNIQUES**

#### **Introduction:**

Managing an ageing high voltage asset population is a key task for utilities and other asset owners. Differing opinions exist regarding the expected life of substations assets and the factors that dictate this life however, generally speaking, assets are being expected to remain in service for longer than ever before. At the same time definitive guidance and recommendation in this field is not readily available. In order to enhance the available guidance in this area SC A3 proposes to undertake a comprehensive review of experiences in the fields of degradation processes, lifetime assessment & life extension techniques, and the role of condition monitoring, refurbishment and re-verification.

This work has the strong support of Study Committee members and was also supported more widely during the 2008 Paris session. It is timely coming 10 years after the publication of TB 165 (lifetime management of circuit-breakers) and at a time when the results of the latest CIGRE reliability survey will become available.

#### **Scope:**

The working group will focus on the following study items regarding life cycle management:

- Material and equipment deterioration/degradation
  - Deterioration mechanisms and precise know-how about materials
  - Forensic analysis of aged equipment
  - Rate of development from material defects to minor/Major Failures and associated risks for equipment
  - Diagnostic methods, evaluation of results, condition assessment
  - Mitigation and maintenance considerations
  - Impact of service stresses (excluding overstressing) on equipment condition
- Lifetime (residual life) management techniques
  - Expected total life for different high voltage equipment
  - Life limiting components and useful life of new and reconditioned parts
  - Relationship between material deterioration, condition assessment techniques, equipment degradation and performance.
  - Impact of changed situations (for instance changed maintenance policy or large overhaul)
- Life extension:
  - Experience with life extension
  - Possibilities and problems with re-testing old equipment
  - Impact of life extension on overhaul and expected period between major overhaul
- Life management for new equipment
  - Expected life and maintenance intervals for new equipment
  - Requirements for, and value of, testing in relation to life cycle management (endurance tests)

#### **Deliverables and time schedule:**

CIGRE Technical Brochure(s) will be produced addressing condition related lifetime management of High Voltage equipment. The precise publication structure and number of TBs will be established by the WG to suit the format of the work e.g. split by technology type or split by materials analysis & practical management aspects.

The WG will produce other technical papers and tutorial material as appropriate.

The proposed duration of the work is three years from the first meeting with the following outline schedule.

First year: survey/summary report with recent developments in the main areas & refinement of work plan

Second year: ongoing collection of experience, information and data, and analysis

Third year: ongoing analysis and production of Technical Brochure(s)

<b>Other SCs concerned by the Work</b>	
A2, B3, C1, D1	
<b>Approval by the TC Chairman: Klaus Fröhlich</b>	<b>Date:19/07/2010</b>