



Study Committee A3 “HV Equipment“

Theory, design, construction and application of HV equipment components, equipment and equipment systems for both AC and DC systems

(devices for switching, interrupting and limiting currents, surge arresters, capacitors, busbars and equipment insulators, instrument transformers, bushings, ...)

SCA3 recent meetings

- **7th SC A3 meeting on 21st August 2009 in Cape Town together with SCB3 and SCA2 annual meetings, regional CIGRE conference and tutorials**
- **8th SC A3 meeting on 25th August 2010 in Paris**

WGs just finishing their work

- ❖ **WG A3.15 „Non Conventional Instrument Transformers“ (P. Tantin, FR) – possibly followed by new WG “NCIT with digital output” (TOR not approved yet)**
- ❖ **WG A3.17 „Surge Arresters“ (B. Richter, CH) – followed by new WG A3.25**
- ❖ **WG A3.21 “Aspects for the Application of Non-Ceramic Insulators to HV and MV Apparatus“ (M.de Nigris, IT)**
- ❖ **WG A3.22 "Technical Requirements for Substation Equipment exceeding 800 kV“ (H. Ito, JP) – followed by new WG A3.28**

Running WGs

➤ **AG A3.01 “Strategic Planning” (M. Waldron, UK)**

➤ **AG A3.04 „Tutorials“ (D.Peelo, Ca)**

❖ **A3.06 “Reliability of HV Equipment”** (C. Soelver, SE)

Analysis of population and failure data collected in 2004-2007 – CB, DS/ES, IT, GIS, GIS testing, extension and maintenance practices

❖ **A3.23 “Guidelines and selection of Fault Current Limiters”** (H. Schmitt, DE)

Summary of FCL locations, different types of FCL (conventional and novel) and their limiting behavior and drawbacks, experience, feasibility, acceptance, interactions with protection and other control and power devices, potential economical savings.

Running WGs

❖ **A3.24 “Tools for Simulating Internal Arc and Current Withstand Testing”** (N. Uzelac, Serbia)

Detailed analysis of topics identified by WGA3.20 as good candidates for using simulations and calculations in addition to or as a replacement of laboratory testing : internal arc testing of SF6 filled equipment and temperature rise type testing.

❖ **A3.25 “MO varistors and surge arresters for emerging system conditions”** (B. Richter, CH)

UHV (1000 kV and above) SA ratings and testing, field strength consequences, axial temperature distribution & testing (single vs multiple impulses, combined stresses, durability).

Running WGs

- ❖ **A3.26 “Influence of shunt capacitor banks on circuit breaker fault interruption duties”** (A. Bosma, SE)
Influence of shunt capacitor banks on line CB TRVs, on fault interrupting time and outrush currents, CB designs considerations, precautions to avoid unnecessary stresses, standardization.
- ❖ **A3.27 “The impact of the application of vacuum switchgear at transmission voltages”** (R.Smeets, NL)
Inventory of installations (4000 VCB 72,5 to 170 kV, 245 kV under development), technical issues (e.g. fast interruption, low energy drives, switching transients, capacitive switching, late restrikes), standardization, testing.

Running WGs (new 2010)

- ❖ **A3.28 “Switching phenomena and testing requirements for UHV & EHV equipment”** (H. Ito, JP)
Field experience and switching behaviour during and after commission, benchmark study of interrupting requirements of circuit breakers based on UHV/EHV networks model, benchmark study of switching requirements on disconnectors and earthing switches based on UHV/EHV substations model.
- ❖ **A3.29 “Deterioration of ageing substation equipment and possible mitigation techniques”**
(A. Maheshwari, Australia) Material and equipment deterioration/degradation (mechanism, forensic analysis, risk to major failure, condition assessment, maintenance & service impact), Lifetime management (residual incl.), Life extension (re-testing, impact on further maintenance), Life management for new equipment (testing and maintenance incl.)

Just approved WGs

- **A3.30 “Impact of overstressing of substation equipment”**
(A. Carvalho, BR) Evaluation of stresses in service vs equipment capabilities (parameters and performance limits), failure modes, risk assessment, standardization (endurance testing incl.), interaction with age and condition information impact on residual life

Publications since August 2009

- ✓ **SCA3 : Brochure 394 “State of Art of Instrument Transformers”, Summary paper ELECTRA 246, October 2009**
- ✓ **WG A3.19 : Brochure 408 “Line Fault Phenomena and their Implications for 3-phase Short and Long-line Fault Clearing”, Summary paper ELECTRA 248, February 2010**

Publications submitted for publishing (circulated for SCA3 commenting)

✓ **March 2009 : Brochure WGA3.15 “Non-conventional Instrument Transformers”**
(editorial changes needed)

✓ **July 2009 : Brochure of WG A3.21 „Aspects for the Application of Composite Insulators to HV apparatus”** (editorial changes needed)

✓ **January 2010 : Brochure WGA3.22 “Background of technical specifications for Substation Equipment Exceeding 800 kV AC”**

SCA3 Paris Session 2012

– Preferential Subjects

PS1: Equipment design to facilitate network developments

- ✓ Design and testing of equipment for HVDC networks
- ✓ Role of intelligence within equipment
- ✓ UHV
- ✓ Impact of changes in AC network design and operation

PS2: Reliability and lifetime of HV equipment

- ✓ Experience and trends in reliability of HV equipment
- ✓ Prediction and management of end of life due to age and/or potential overstressing
- ✓ Role of condition monitoring and assessment

PS3: Environmental suitability of high voltage equipment

- ✓ Design to minimise environmental impact
- ✓ Design and testing for extreme ambient conditions (temperature, seismic levels, pollution ...)
- ✓ Design for offshore/marine environments



Study Committee SC A3

SCA3 Session 2011 & – Preferential Subjects Paris 2012

SCA3 session 2011 – Austria, 7.-9. September 2011

Thank you for your attention