



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

- **8th SC A3 meeting on 25th August 2010
in Paris**
- **9th SC A3 meeting on 9th September 2011
in Vienna together with HV Equipment
tutorial and colloquium (7th ad 8th September)**

WGs just finishing their work

- ❖ **WG A3.15 „Non Conventional Instrument Transformers“ – followed by new WG A3.31**
- ❖ **WG A3.17 „Surge Arresters“ (B. Richter, CH) – Part 1 – followed by new WG A3.25 (Part 2)**
- ❖ **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**
- ❖ **WG A3.22 “Reliability of HV Equipment“ – 6 brochures ready for publishing (C. Solver, SE, M. Runde, N)**

Running WGs

- **AG A3.01 “Strategic Planning” (M. Waldron, UK)**
- **AG A3.04 „Tutorials“ (D.Peelo, Ca)**

❖ **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. - Part 1 brochure “Application & feasibility of FCL in power systems” almost ready

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). – Part 2 (Part 1 published within WG A3.17)

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

- ❖ **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 “Managing of Ageing HV Substation Equipment”** (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.)

Running WGs (new 2011)

- **A3.30 “Managing 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
- **A3.31 “Accuracy, Calibration & Interfacing of Instrument Transformers with Digital Outputs”**
(F. Rahmatian, CN) – Practical application of NCIT and EIT in the respect of their (and their measuring chain) accuracy, on-site calibration and interfacing

Publications since 2010

- ✓ **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**
- ✓ **WG A3.21 : Brochure 455 „Aspects for the Application of Composite Insulators to HV apparatus”, Summary paper ELECTRA 255, April 2011**

Publications since 2010

- ✓ **WGA3.22 : Brochure 456 “Background of technical specifications for Substation Equipment Exceeding 800 kV AC”, Summary paper ELECTRA 255, April 2011**



Study Committee SC A3

Publications submitted for publishing (circulated for SCA3 commenting)

- ✓ **Brochure WGA3.15 “Non-conventional Instrument Transformers”**
(editorial changes needed)
- ✓ **5+1 Brochures WG A3.06 “HV Equipment reliability”** (each kind of equipment having its own TB)

SCA3 Paris Session 2012 – Preferential Subjects

- ✓ **PS1 : Equipment design to facilitate network developments** (HVDC equipment design and testing, UHV, intelligence within equipment, impact of changes in AC network operation)
- ✓ **PS2 : Reliability and Lifetime of HV equipment** (reliability experience, prediction of end of life due to age and potential overstressing, condition monitoring and assessment)
- ✓ **PS3 : Environmental suitability of HV equipment** (design to minimize environmental impact, design for extreme ambient conditions, design for offshore/marine environments)

SCA3 future meetings

- A3 Session and SC meeting in Paris, France, 27th to 31st August 2012**

- SC A3 meeting in 2013 : either together with B3 in Brisbane, Australia, 7th to 13th September 2013 or in China**