

CIGRE A3

High Voltage Equipment

October 2011

CIGRE A3- High Voltage Equipment

- CIGRE Study Committee A3 covers High Voltage Equipment:
 - Switchgear (HV, MV)
 - Capacitors
 - Surge Arresters
 - Instrument Transformers
- 24 Countries have memberships
- Operates as Technical Advisory to IEC
- Focus on technical/engineering/scientific aspects only
- Work based WG meetings (separate)

US Participation in CIGRE

- Due to our collective efforts in CIGRE US National Committee, we are now the leading contributor to CIGRE international working bodies across all other countries. Our relative performance - over 250 US experts are engaged.
- For more details see: <http://www.cigre-a3.org/>
http://www.cigre-a3.org/Site/WG/Ru_wg.asp
<http://cigre-usnc.tamu.edu/>

A3.24

- **A3.24 – Tools for Simulating Internal Arc and Current Withstand Testing, chair- N. Uzelac, US, TOR available upon request**
- US members:
 - Nenad Uzelac, G&W
 - Mietek Glinkowski, ABB Inc.
- Last meetings: Jan 2011, Zurich, CH,
 - Sept. Vienna, AT
- TB to be published late 2012.

A3.25

- **A3.25 - Metal Oxide varistors and surge arresters for emerging system conditions**, chair- B. Richter, CH, TOR available upon request
- US members:
 - none so far, SPD Chair frank.waterer@us.schneider-electric.com
 - Corresponding members:
 - Jon Woodworth - Arresterworks
 - Mike Pouber - Hubbell

A3.26

- **A3.26 – Influence of shunt capacitor banks on circuit breaker fault interruption duties, Chair: Anne Bosma, SE, TOR available upon request**
- US members:
 - Roy Alexander, PPL
 - Luke Collette, Mitsubishi
- Corresponding members:
 - Mark McVey, Dominion
 - Jeff Nelson, TVA
 - Nicolas Toquet, Areva

A3.27

- **A3.27 – The impact of the application of vacuum switchgear at transmission voltages, chair: Rene Smeets, NL, TOR available upon request**
- US members:
 - Kirk Smith, Eaton
 - Mietek Glinkowski, ABB Inc.
 - Pete Meyer, S&C
 - Dave Johnson, consultant
- Corresponding member:
 - Ben Bufi, HVB
 - Ken Edwards, BPA
- global survey completed with 113 responses
- UGT group participated in the global survey with 22 responses (largest group!)
- Last meeting – Pittsburgh PA- October 4-5, 2011

A3.28

- **Switching phenomena and testing requirements for UHV & EHV equipment, chair: Hiroki Ito (Japan)**
TOR available upon request
- Field experience and switching behavior during and after commission
- Benchmark study of interrupting requirements of GCB based on model UHV/EHV networks
- Benchmark study of switching requirements of DS, HSGS and ES based on model UHV/EHV substations
- US members: Ben Shperling, NYPA

A3.29 - new

- **DETERIORATION OF AGEING SUBSTATION EQUIPMENT AND POSSIBLE MITIGATION TECHNIQUES**
- Proposed Convenor: Ankur MAHESHWARI (AU)
- **Scope:**
 - Material and equipment deterioration/degradation
 - Lifetime (residual life) assessment techniques
 - Life extension:
 - Life management for new equipment
- **TOR** posted on our Webpage
- US Interested in participating: Jon Woodworth (Arresterworks), Ken Edwards (BPA)

A3.30 - new

IMPACT OF OVERSTRESSING OF SUBSTATION EQUIPMENT

Proposed Convenor: Antonio Carvalho (BR)

- Review key network parameters and anticipated stresses affecting equipment capabilities
- Review of methods already in use to assess the risk of operating beyond the performance limits
- Identification of potential failure modes of overstressed equipment and their impacts (safety, reliability, availability)
- Determination of the capabilities of the equipment involved (Standards, Test Protocols, manufacturer's information, re-testing)
- Mitigation techniques
- Impact of overstressing on residual life (where immediate failure is avoided)
- Usefulness of information supplied at type and endurance testing & proposals for enhancements
- Interaction with age and/or condition information

TOR posted on our Webpage

US interested in participating: Ken Edwards (BPA)

Instrument Transformers with digital output

Proposed Convenor: Farnoosh Rahmatian, CN

- Proposal & analysis of procedures for calibration of the entire measuring chain, both in the factory and on site, for digital output of NCITs or for a SAMU connected to classical ITs and/or EITs.
- Description of the practical applications of using flexible EITs for on-site calibration without disconnection or de-energisation.
- Consideration and description of the migration of the digitalisation process from low voltage equipments (protective relays, meters, ...) to the high voltage equipments. Overall accuracy of the measurement chain, including transient responses for both protective and measuring classes, and taking into account the work of B5.24, will be proposed for consideration by IEC standardisation committees.
- Investigation & proposals for DC accuracy classes and calibration method for HVDC applications.
- Proposal & analysis of EMC test methods considering various earthing and shielding techniques for specific application of EITs and SAMU up to 1100 kV. A test procedure will be developed & proposed taking into account the requirements of the IEC 60044-8.
- Analysis & discussion of redundancy requirements for EITs and SAMU in the context of protection schemes.
- Proposal and analysis of solutions where control functions using digital signals, e.g. for disconnectors or circuit breakers, are integrated into the NCIT or SAMU hardware.

The group will maintain a close dialogue with the relevant IEC committees via shared membership & mutual reporting.

CIGRE SC A3 meeting

- Meeting of Study Committee A3
 - Sept 7, 2011, Vienna, AT
 - Tutorial of **WG A3-23 “Fault Current Limiters”** by *Heino Schmidt*
 - Tutorial of **WG A3-06 “Reliability of High Voltage Equipment”** by *Magne Runde*
 - Tutorial of **WG A3-17 “Surge Arresters”** by *Bernhard Richter*
 - Tutorial of **WG A3-27 “High Voltage Vacuum Switchgear”** by *Rene Smeets*
 - Sept 8 – Colloquium (paper presentations)
 - Sept 9 - Main Committee meeting

Highlights of the Main Committee meeting

- Plenary meeting (every two years) – next: Paris 2012
- Change of Chairmanship
- WG Reports and Status updates
- Strategic Planning
- Tutorials



Strategic Planning

		A3.01	A3.04	A3.06	A3.15	A3.17	A3.21	A3.22	A3.23	A3.24	A3.25	A3.26	A3.27	P1	P2	P3	P4	P5
Todays situation	Electrical power sector will play an increasing role in the energy mix																	
	Less people have deep knowledge in the field of electrical energy		█															
	CIGRE is the biggest international platform for the electrical power society																	
Factors shaping the future of the electrical power sector	Customer energy demands							█										█
	Environmental needs														█			
	Regulation and legislation				█												█	
	New- and developing technologies				█		█	█	█	█	█			█			█	█
	Ageing of the existing power system			█												█		
Strategic Directions of the Technical Committee	The future of the electrical power system				█			█	█					█			█	█
	Focus on environment and sustainability													█				
	Make best use of the existing power system			█		█				█	█	█			█			█
	Communication on power system issues toward political decision makers																	



- AG A3.01 Strategic Planning
- AG A3.04 Tutorials
- WG A3.06 Reliability of High Voltage Equipment
- WG A3.15 Non Conventional Instrument Transformers
- WG A3.17 Surge Arrester
- WG A3.21 Application of HV apparatus with composite insulators
- WG A3.22 Tech. Requirements for Substation Equipment > 800 kV
- WG A3.23 Guidelines and selection of Fault-Current-Limiters
- WG A3.24 Simulating internal arc and current withstand testing
- WG A3.25 MO varistors and surge arresters for emerging system conditions
- WG A3.26 Capacitor bank switching and impact on equipment
- WG A3.27 The impact of the application of vacuum switchgear at transmission voltages
- Proposals
- WG P1 Non ceramic insulators for MV
- WG P2 Asset management
- WG P3 NCIT – testing and calibration
- WG P4 UHV – follow-up
- WG P5 Simulation and calculation of temperature rise

Tutorials

Some changes have been agreed on in Vienna.

Tutorials Advisory Group

The Tutorials Advisory Group has the task of arranging for the dissemination of the technical information developed within the SC and its Working Groups. It will plan, develop, manage and deliver workshops, colloquia and tutorials in coordination with local CIGRE organizations. It will also represent the SC in EPEE matters.

- CIGRE is an excellent source of technical information and research on power engineering subjects
- Switchgear (and PES) can use CIGRE as an opportunity to
 - get technical background information on any subject of interest
 - request formation of a new WG
 - form a joint WG

CIGRE and PES

- PES – CIGRE Cooperation Agreement

POLICY FOR COOPERATION

Between

the International Council on Large Electric Systems (CIGRE)

and

**the Power Engineering Society (PES) of
the Institute of Electrical and Electronics Engineers (IEEE)**

CIGRE and IEEE/PES each have long traditions of excellence in the development and dissemination of engineering information regarding electric power systems. It is apparent that many of the subjects under development are the same for both organisations. It is agreed the objectives of both organisations are best served by coordinating development efforts and cooperating in the dissemination of the engineering information on selected topics which are identified to be of mutual interest.

To engender such activity, CIGRE and IEEE/PES agree to establish the means and motivation to accomplish a cooperative effort to pursue such mutual objectives. The following are agreed:



CIGRE link on our website

<u>Subcommittee Pages</u>	
Administrative Subcommittee (ADSCOM)	Low Voltage Switchgear Devices Subcommittee
Education, Recognition, and Publication Subcommittee (ERP)	High Voltage Circuit Breaker Subcommittee (HV)
High Voltage Fuses Subcommittee (HVF)	Reclosers and Other Distribution Equipment Sub
High Voltage Switches Subcommittee (HVS)	Switchgear Assemblies Subcommittee (SA)
<u>Miscellaneous items within this</u>	
Interpretation of Standards- guidelines: <u>Short ver.</u>, <u>Full size ver.</u>	Switchgear Committee New
IEEE SA Electronic Balloting Process (updated May 04)	Switchgear Committee Or
IEEE SA Sample Recirculation Letter (updated May 04)	Switchgear Bibliography (19
IEEE SA Sample Balloting Letter (updated Oct. 02)	download WG Standards co
IEEE SA Items of Interest (updated May 04)	
<u>CIGRE Study Committee A3 (Switchgear)- News and Info</u>	
<u>Other Links of Interest outside th</u>	
IEEE SA- My Ballot	NEMA
Patent Concerns- IEEE-SA << USE IN ALL MEETINGS!	NIST
IEEE SA Standards Association	IEEE





Study Committee A3



US National Committee of CIGRE
and
CIGRE Study Committee A3 (HV Equipment)

**Note that CIGRE A3 Committee has a slightly wider scope than IEEE Switchgear Committee and includes:
Outdoor insulators, switching devices, current and voltage measuring devices, surge arresters, and capacitors.**

In 2001 CIGRE and Power and Energy Society have signed a Cooperation Agreement regarding excellence in the development and dissemination of engineering information in electric power systems. For the full Cooperation agreement document click [here](#).

News and Info (updated September 2011)

US National Committee of CIGRE representative to [Study Committee A3 \(High Voltage Equipment\)](#):

[Mietek Glinkowski](#)

Recent news from Study Committee A3 - High Voltage Equipment

[Spring 2011 CIGRE A3 Liaison Report](#)

Last Study Committee A3 meeting::

September 7-9, 2011

Vienna, Austria

New A3.31 WG established:

Instrument Transformers with digital output

Proposed Convenor: Farnoosh Rahmatian, CN