



## 2012 Activity Report

### Study Committee A2

#### 1. Highlights

- Three new WG were started: WG A2.48 about "Technology and utilization of Oil Insulated High Voltage Shunt Reactors", WG A2.49 about "Condition Assessment of Power Transformers" and WG A2.50 about "Effect of the distributed energy sources and consequent induced reverse power flow (step up) on transmission and distribution transformers"
- Two WGs completed their work late in 2012: WG A2.33 on "Guide for Transformer Fire Safety Practices" and WG A2.36 "Guide for Transformer Procurement Process". These two WG created four brochures that will be published in early 2013. These two WGs will be disbanded in 2013
- Publication in Electra in April 2012 of an interim report by WG A2.37 "Transformer Reliability Survey", publication in Electra also in April 2012 of a report on the Kyoto A2/D1 Colloquium and publication of a report in Electra in August 2012 titled "Transformer Efficiency – Avenues to make a good thing even better"
- Thirteen WGs are currently running within SC A2: WG A2.37, WG A2.38, JWG A2/C4.39, WG A2.40, JWG A2/D1.41, WG A2.42, WG A2.43, WG A2.44, WG A2.45, JWG A2/D1.46, JWG , WG A2.48, WG A2.49 and WG A2.50. Another group named JWG D1/A2.47 is under the hat of another SC.
- Continuation to the inventory of SC A2 member expertise by the use of mini-cv
- Maintenance of a library of all the Colloquium Publications held in the last 15 years
- Preparation of short reports approved by SC A2 on selected subjects to improve SC A2 website content

#### 2. Working group changes since the last TC meeting

##### 2.1 New WG

During year 2012, three new WG were started: WG A2.48 on ""Technology and utilization of Oil Insulated High Voltage Shunt Reactors", WG A2.49 on "Condition Assessment of Power Transformers" and WG A2.50 on "Effect of the distributed energy sources and consequent induced reverse power flow (step up) on transmission and distribution transformers"

WG A2.48: "Technology and utilization of Oil Insulated HV Shunt Reactors" (G. Hanna/IR)

- Specification and design review, type/routine tests and criteria
- Reactor noise, low noise reactors, mitigation solution for existing reactors
- Reliability in service and failure investigations
- Condition assessment and monitoring, DGA interpretation.



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### 2.1 New WG (suite)

WG A2.49 "Condition Assessment of Power Transformers" (P. Coles / AU)

- Review existing CIGRE documents and other literature that relate to this subject;
- Determine key parameters and weights
- Consider how to use health index to make asset management decisions
- Use of complementary information as criticality, performance, utilization, obsolescence

WG A2.50: "Effect of the distributed energy sources and consequent induced reverse power flow (step up) on transmission and distribution transformers" (J.C. Riboud / FR)

- Address the effect of step up operation on transformers not designed for this purpose
- Evaluate effect on flux density, temperature rise, noise and other performances
- Differing locations: final distribution, primary distribution and principal transmission
- Risks and limitations to step up operation for each technology

### 2.2 WG Disbanded

The following WGs completed their work in late 2012 and will be disbanded in 2013:

- WG A2.33 on "Guide for Transformer Fire Safety Practices"
- WG A2.36 "Guide for Transformer Procurement Process".

### 2.3 Allocation of WG to the 4 TC strategic directions

The following table shows the relation of the SC A2 Working Groups with the TC Strategic directions:

WG	Title of the WG	Strategic dir.*
A2-37	Transformer Reliability Survey	2,3,4
A2.38	Transformer Thermal Modelling	2
A2/C4.39	Electrical Transient Interaction between transformers. and Power System	1,2
A2.40	Copper sulphide long-term mitigation and risk assessment	2
A2/D1.41	Oil conductivity under DC condition	1,2
A2.42	Guide on Transformer Transportation	1,2
2.43	Transformer bushings reliability	2,3
A2.44	Transformer Intelligent Condition Monitoring	1,2,4
A2.45	Transformer failure investigation and post-mortem analysis	2,3
A2/D1.46	Field experience with transformer solid insulating ageing markers	2,3
A2.48	Technology and utilization of Oil Insulated HV Shunt Reactors"	1,2,3
A2.49	Condition Assessment of Power Transformers	2
A2.50	Effect of the distributed energy sources and consequent induced reverse power flow (step up) on transmission and distribution transformers	1,2,3

\* Strategic Directions: indicate the main strategic direction, or the two main directions if needed

- 1 : The future power system
- 2 : Best use of the existing power system
- 3 : Environment and sustainability
- 4 : Communication with the public and with political decision makers



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### 3. Publications

#### 3.1 Publications since the last TC meeting (April 2012)

The following publications have been prepared by SC A2 since the last TC:

- Publication in Electra (April 2012) of an interim report by WG A2.37 "Transformer Reliability Survey"
- Publication in Electra (April 2012) of a report on the Kyoto A2/D1 Colloquium
- Publication of a report in Electra (August 2012) titled "Transformer Efficiency – Avenues to make a good thing even better" in the name of SC A2

#### 3.2 Publication plan for the coming year

In the coming year, the following documents are planned to be published by SCA2:

- Annual report on SC A2 activities in Electra (February 2013)
- Brochure and Electra Paper for WG A2.33 Transformer Fire Safety:
- Brochure and Electra Paper for WG A2.36 Guide for Transformer Procurement:
- Brochure and Electra Paper for WG A2.37 Reliability Surveys
- Brochure and Electra Paper for WG A2.38 Transformer Thermal Modelling
- Brochure and Electra Paper for JWG A2/C4 Transient Interaction

### 4. Tutorials and workshops in 2012

In 2012, SC A2 Tutorial/Workshops were given during the following events:

TechCon North America, Chicago, USA, March 2012

- Transformer Short Circuit Performance
- Guide for Transformer Maintenance

Life of a transformer (Doble Engineering), Florida, USA, March 2012

- Guide for transformer maintenance

Conference "Transformer Research and Asset Management" Dubrovnik, Croatia, May 2012

- Guide for Transformer Maintenance

Diagnostic Conference, Koln, Germany, November 2012

- Economics of Transformer Management
- Mechanical-condition assessment of transformer windings using FRA
- Transformer Condition Monitoring
- Moisture Equilibrium and Migration within Transformer Insulation Systems
- Guide for Transformer Maintenance
- Experience in service with new insulation liquids



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### 5. Strategic Plan and Action Plan

An updated version of the Strategic Plan 2010-2016 is available in the website

### 6. Planned SC meetings

- 2013: September 12<sup>th</sup> in Zurich (CH) during the SC A2/C4 Joint Colloquium
- 2014: During the CIGRE Paris Session

### 7. Participation to Regional Meetings, colloquia and symposia :

In 2012 (passed)

- TechCon North America, Chicago, USA, March 2012
- Life of a transformer (Doble Engineering), Florida, USA, March 2012
- Transformer Research and Asset Management, Dubrovnik, Croatia, May 2012
- Diagnostik elektrischer Betriesmitte, Koln, Germany, November 2012

In 2013 and beyond (scheduled)

- UHV Colloquium, April 2013, New Delhi, India
- Electrical Insulation Conference (IEEE), Ottawa, Canada, June 2013
- SC A2/C4 2013 Colloquium, Zurich, Switzerland, September 2013
- Best Practices in Transmission and Distribution in a changing environment, Auckland, New Zealand, September 2013
- Transform Conference, Abu Dhabi, United Arab Emirates, November 2013

### 8. Relations with other organisations

Strong relation with IEC TC14 and IEEE Transformer Committee

### 9. Measures to improve the quality of SC documents

The following instructions are given to all new WG Convenors:

- During the first year of a WG life, convenor are invited to submit a preliminary brochure table of content
- Identify early in the WG life members who are native English to be part of an editorial task force prior to brochure publication
- A communication officer is involved with the SC Chairman in the final review of all SC publications



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### 10 SC website : on-line contents and date of last update

The SC A2 website is updated regularly and reflects the current structure and progress of the SC work forces. The content is typically updated at least every month.

In order to improve the SC A2 website technical content, a new concept is in preparation: Subjects of interest will be identified and the SC A2 Chairman will ask to selected experts to prepare short reports on these subjects. These short reports will then be approved by SC A2 and so, will become the "opinion of SC A2 experts". It is planned to publish these reports in the public area of the SC A2 website. A possibility will also be to published some of these reports in Electra.

### 11 Communication Officer

Pierre Boss, former Chairman of SC A2, is the SC A2 Communication Officer. His role is to collaborate with the SC A2 chairman to ensure the quality of the publications released by the SC and to ensure that the content of the brochure is consistent with the values and directions of CIGRÉ.

### 12 Miscellaneous

SC A2 took the initiative to ask to all SC members to prepare a short CV available to all other members. This initiative helps the chairman and secretary to know the competence and experience of each member, helps members to know each other and is helpful to facilitate the integration of new SC members.

SC A2 has created a library that contents the publication of colloquium held during the last 15 years: 1997 (Sydney), 1999 (Budapest), 2001 (Dublin), 2003 (Mérida), 2005 (Moscow), 2007 (Bruges), 2009 (Cape Town) and 2011 (Kyoto).

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