



**CONSEIL INTERNATIONAL DES GRANDS RÉSEAUX ELECTRIQUES**  
**INTERNATIONAL COUNCIL ON LARGE ELECTRIC SYSTEMS**

**COMITE D'ETUDES**  
**A1**  
**STUDY COMMITTEE**

**Machines Tournantes**  
**Rotating Machines**

**ACTIVITY REPORT**

**OF**

**STUDY COMMITTEE A1**

**ROTATING ELECTRICAL MACHINES**

**2008**

**ISSUED: APRIL 2009**

## **1. Highlights**

For many years, manufacturers have increased the size of the generators they produced in order to gain the benefits of economy-of-scale. This trend slowed down with the introduction of gas turbines, but the recent move back towards nuclear plant again requires larger units to be produced and a similar size increase may be seen on fossil-fired 2-pole units. Hydro generation, however, has not experienced similar changes in machine sizes. Due to the relevance of this theme, in the 2008 Biennial Session, SC-A1 organized a Panel Session called Giga-Watt Machines where manufacturers around the world presented their latest developments on very large generators. Around 180 delegates attended the Session.

At the end of 2007 the wind capacity worldwide was around 94,000.00 MW. Roughly 20,000 MW was added in 2007, the highest volume achieved in a single year, and up from about 15,000 MW in 2006. In order to discuss the latest technological developments of this generation, SC A1 decided in 2008 to organize a Panel Session on this subject during the 2010 Biennial CIGRE Session.

A joint Colloquium was organized with SC D1 in order to discuss and share knowledge, experiences and potential new ideas. More than 200 participants from manufacturers, utilities, research institutes and universities attended the event which was held in the city of Gyeongju, South Korea, from 21 to 26 October 2007.

At the 2008 Paris Meeting Erli Figueiredo, from Brazil, took over as the Chairman of SC A1 replacing Gert Coetzee from South Africa, who had been the Chairman of the Committee in the period 2004 - 2008. The new Secretary is Oscar Martinez from Spain who replaced Reinhard Yoho from Switzerland.

## **2. Working group changes since the last TC meeting (April 2008):**

### **2.1. The following new Working Groups and Task Forces were created since the last TC meeting:**

- WG A1.08: Power station large motors requirements in the field of standards
- WG A1.10: Survey of hydrogenerators failures
- WG A1.12: State of the art of the efficiency in hydrogenerators commissioned in the last 10 years
- WG A1.13: Feasibility of updating from class F to H the insulation systems in electrical rotating machines
- WG A1.14: Guide for minimizing the damage from stator winding ground faults on hydrogenerators
- WG A1.17: Methods of determining the condition of stator winding insulation and their effectiveness
- WG A1.18: Extending life of large motors in Nuclear power plants
- WG A1.19: Motor Failure Survey
- TF A1.20: Establish the background and scope for new working groups on wind generation

### **2.2. Disbanded Working Groups**

- **WG A1.07:** Generator maintenance, inspection and test programs
- **WG A1.09:** Guide for minimizing the damage from stator winding grounds on turbogenerators

### **2.3. Resulting total number of WGs**

- 17 WGs and 1 TF

## **3. Publications**

### 3.1. Publications since the last TC meeting (April 2008)

- None

### 3.2. Works Finished:

The following works are already finished and their present status for publication is:

Title	Type	Status
Generator maintenance, inspection and test programs	TB	Finished. Waiting publication by the Central Office. Sent in mid-February.
Guide for minimizing the damage from sta-tor winding grounds on turbogenerators	TB	Finished. Waiting publication by the Central Office. Sent in mid-March.
Survey of hydrogenerators failures	TB	In preparation.
Intermittent operation – Experience with hydrogenerators	Report	Document approved. Report not finished yet
Guide for on-line monitoring of electrical generators	TB	Document approved. Report not finished yet

TB – Technical Brochure

This publication plan depends on the availability for publishing in Electra. Our TB “Generator maintenance, inspection and test programs” was sent to the Central Office in mid-february and shall be published in august, with an interval of six months.

### 4. Strategic Plan and Action Plan:

Strategic Plan was reviewed and Action Plan done.

### 5. Planned SC meetings

Besides the normal SC A1 Meeting in the 2010 Paris Biennial Session, the following meetings are planned:

**5.1.** In 2009, the Meeting and Colloquium of the SC will be held in Australia, in the city of Sydney, from Sunday 20th - Friday 25th September.

A Colloquium on New Developments and Asset Management of Electrical Machines will take place on Wednesday 23 September with focus on turbogenerators, hydrogenerators, and large power station motors.

**5.2.** In 2011, the Meeting and Colloquium of the SC will be held in China attending an invitation from the Chinese National Committee (CNC). Details about the event will be discussed at the SC Session Meeting in Australia where is scheduled a presentation by the CNC.

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

Whenever these events cover subjects of interest for A1, a member or members based in the area where they are held is asked to participate as an official representative of the study committee.

In 2009, SC A1 will take part in the ERIAC Regional Meeting to be held in Argentina from May 24 to 28. A WG Convener and a member of SC-A1 will present two technical papers and one of its regular members will act as a reporter. The ERIAC is the greatest Regional Meeting of CIGRE having the participation of the National Committees from Brazil, Argentina, US, Espanha, Portugal, Chile, Venezuela, Colombia, Mexico, Uruguay, Paraguai and Bolivia.

### 7. Relations with other organisations

SC A1 maintains links with the IEEE Power Committee and IEC and has common members on both organizations who participate in some of their working groups.

### 8. Specific actions for the recruitment of young experts

The Brazilian National Committee sponsors every year around 60 students from several universities as individual members of CIGRE for a two years period. After graduation most of them continue as CIGRE members taking part in the activities of the SCs. Part of this sponsorship is due to the Brazilian Electrical Rotating Machines Committee which every two years organizes a Seminar on Electrical Machines having a partnership with a Brazilian Electrical Power Company. Part of the profit of these Seminars are destined to support some of the Brazilian students as individual members of CIGRE.

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

The SC A1 website has not been updated for a long time. Then, we start the process of updating the website and have done a search on the agenda of meetings, colloquia, documents and every other source that could be of some help. We have updated most part of the site as shown by the table below that presents a summary of the updates. The update of SC-A1 will be done regularly.

Page	Comments on updates	Latest Modifications
Members Area/Pictures	Picture added.	28 Mar 09
Members Area/SC Documents	Taken out old documents. New WG questionnaires added. Chairman letters for 2008 Paris Session added.	08 Mar 09
Technical Activities/TC Awards	Updated.	08 Mar 09
What is SC A1/Activities	Updated.	25 Jan 09
What is SC A1/Membership	New membership as defined in 2008 updated.	25 Jan 09
What is SC A1/Structure	New structure after the 2008 meeting updated.	25 Jan 09
Events	2009 Meeting and Colloquium in Australia added.	25 Jan 09
Events/Session	2010 and 2008 Preferential Subjects added. 2008 A1 Panel Session presentations about Giga-Watt Generation added.	25 Jan 09
Members Area	SC Paris Agenda 2008 added.	25 Jan 09
Members Area/SC Meetings Minutes	2008 Paris Minutes of the Meeting added.	25 Jan 09
WG Area	Working Group Area updated.	25 Jan 09
Strategic Plan	2005 Strategic Plan added.	25 Sep 07
SC Library	TG monitoring added /High Efficiency added/VSD added/Soft start added.	05 Feb 07

Prepared by: Erli F. Figueiredo  
04/15/2009