



CONSEIL INTERNATIONAL DES GRANDS RÉSEAUX ELECTRIQUES

INTERNATIONAL COUNCIL ON LARGE ELECTRIC SYSTEMS

**COMITE D'ETUDES
A1
STUDY COMMITTEE**

Machines Tournantes

Rotating Machines

ACTION PLAN

OF

STUDY COMMITTEE A1

ROTATING ELECTRICAL MACHINES

2010 - 2012

(APRIL 2010)

ACTION PLAN
OF
STUDY COMMITTEE A1
ELECTRICAL ROTATING MACHINES
2010 – 2012

1. INTRODUCTION

The purpose of this Action Plan is to describe the technical and administrative activities that SC A1 intends to lead in period 2010-2012. These activities are in line with the directions defined in the 2009 – 2019 Strategic Plan of the Study Committee. If necessary this Action Plan will be updated during its validity period.

2. STRATEGIC DIRECTIONS

Based on the changes of the operational and business environments and on the ambitions and objectives of Study Committee A1, the following Strategic Directions have been defined:

2.1. STRATEGIC TECHNICAL DIRECTIONS:

Within its field of activity study committee A1 shall:

⇒ Serve all its customers involved in the process of generating electrical energy by means of:

- Providing a forum where suppliers and users can share and exchange experiences and information
- Being aware of customers needs
- Monitoring and reporting on the international development
- Promoting trends beneficial for its customers
- Issuing guidelines and recommendations
- Updating former reports due to recent developments in design, materials, insulation, cooling and bearings technology and improvements in efficiency and maintenance.

⇒ Promote innovative solutions and concepts considering all relevant factors (economical, technical, environmental and others)

⇒ Be aware of the needs of the developing countries, actively work in order to fulfill them and involve representatives for these countries in its work

⇒ Actively promote and support international co-operation and conferences

⇒ Promote Symposium/Colloquium during Study Committee Meetings in odd years

⇒ Participate in Regional Meetings with technical contributions

2.2. STRATEGIC ADMINISTRATIVE DIRECTIONS

2.2.1. Organization of work

Focus will be placed on shorter turn-around time of existing projects in the working groups and task forces in order to comply, as much as possible, with the duration of three years or less established by CIGRE to carry out the works, as well to produce relevant documents for publication. Initially the committee needs to complete existing tasks, however new WGs/TFs may be created to assume new works, but without exceeding the “firepower” of the SC.

The organization of the study committee and its way of working shall be adapted to the changing operating environment, aiming at increased flexibility and short response time. The use of e-mail system, the web and setting milestones between meetings will be used to speed up the work output.

2.2.2. Co-operation with others

Establish a more extensive co-operation within CIGRE, in particular with the System Study Committees. Improve co-operation with other international organizations in the field, particularly with the standardization organizations.

2.2.3. Use of internet

Encourage the use of internet applications.

2.2.4. Tutorials

Disseminate technical knowledge by means of Tutorials

2.2.5. Young experts

Promote the recruitment of young experts and their inclusion in the activities of the Committee.

3. ACTIVITIES OF THE APPROVED WORKING BODIES

3.1. AG A1.01: TURBOGENERATORS

The following working groups operate under the advisory of AG A1.01:

3.1.1. Scope and objectives

3.1.1.1. WG A1.01: Guide on Overfluxing Generators

This working group has the task of investigating the incidents where generators have failed catastrophically due to over fluxing, study the behavior of the flux in the generator when excitation is turned on (fast ramp and slow ramp) and recommended a solution to avoid this problem.

3.1.1.2. WG A1.03: Guide on Generator/Power System Inter relationship Issues

This working group shall: Research grid code practices, OEM and utility concerns on the issues of grid interface. Discrepancies between IEC standards, USA standards and real problems OEM and users have with the above will be investigated and highlighted. This work will be coordinated with the other relevant CIGRE committees.

3.1.1.3. WG A1.05: Economic Evaluation of Generator Refurbishment / Replacement

This working group shall provide a Guide for Economic Evaluation of Refurbishment/Replacement decisions on generator systems and related power plant equipment. Describe the influence of condition based monitoring, inspection, inspection, operating history as inputs to the decision process. Discuss the methodology of estimating the risk of each potential course of action.

3.1.1.4. WG A1.11: Guide for On-Line Monitoring of Electrical Generators

This working group has the objective to make an assessment of the stage and the future development of the on-line condition monitoring tools for large generators.

3.1.1.5. WG A1.15: Guide on Stator Water Chemistry Management

This working group will analyze the problem which can be caused by the cooling water in stator winding due to its circulation through hollow conductors made of copper in order to avoid the plugging of these hollow conductors by oxide deposition. It appears that water chemistry management is very important to prevent plugging and stator cooling deterioration. Several ways of eliminating plugging root causes are available, depending on manufacturers or utilities.

3.1.1.6. WG A1.16: Guide on Generator Coil Retaining Ring - a System Survey and General Guideline

This working group has the objective to investigate the problem of stress corrosion cracking on the coil retaining ring of large turbo-generators and make recommendations to avoid this problem.

3.1.1.7. WG A1.22: Guide - Consideration of Duty on Windings

In this Guide will be reviewed operating practice, aging processes of generator windings, their consequences and the way to monitor and detect fault appearance, and will be proposed the condition assessment and maintenance practices according to generator technologies.

3.1.1.8. WG A1.23: State of the Art and Capacity for Robotic Inspection of Turbo-Generators

Explore the possibility of updating the maintenance systems used in rotating electrical machines replacing traditional maintenance removing rotating field by robotic inspections of the machines. It will take into account two different points of view: the OEMs (Original Equipment Manufacturers) and the Users point of view.

3.1.2. Action Plan: Present status of the activities

Advisory Convener: Robert Fenton (US)

Working Group	Title	Name of Convener	STATUS	Ready for Publication
A1.01	Guide on Over fluxing Generators	Neil Connolly (UK)	<ol style="list-style-type: none"> 1. Terms of Reference (TOR) issued for Approval by 15 November 2007. 2. Draft version 1 issued by 15 January 2008. 3. Comments on version 1 by 30 April 2008. 4. Neil Connolly (UK) published a revision 1 draft 15 July 2008 5. Comments on Revision 0 by 15 November 2008. 6. Revision 2 issued by 31 May 2010 7. Comments by 31 July 2010 8. Revision 3 by 30 November 2010 9. Discussion and final approval at 2011 meeting in China 10. Final report in 2011 11. A training program will be developed once the work is complete 	2012
A1.03	Guide on Generator/Power System Inter relationship Issues	Luis Ruoco (ES)	<ol style="list-style-type: none"> 1. Terms of Reference (TOR) issued for approval by 31 December 2007. Approved 2. Scope issued for approval by 31 December 2007. Approved 3. Define team members and assign responsibilities by 31 January 2010 4. Status Report at Paris meeting August 2010 4. Revision 0 of at least 3 chapters by 28 April 2011 5. Comments on Revision) by 30 June 2011 6. Revision 1 by 31 August 2011 for China meeting 7. Comments on Revision 1 by 30 November 2011 8. Final Draft Guide by 30 March 2012 9. Comments to Final revision by 30 June 2012 10. Final approval Paris 2012 Technical brochure and Tutorial by 31 December 2012 	2013
A1.05	Economic Evaluation of Generator Refurbishment / Replacement	S. Salem (US)	<ol style="list-style-type: none"> 1. Sam to assign detailed tasks to team members by 31 December 2008 2. Draft Revision 1 to A1.01 members by 30 May 2010 3. Comments by 15 June 2010 4. Discussion at Paris 2010. 5. Draft Revision 2 by 31 January 2011 6. Comments by 31 May 2011 7. Draft Revision 3 by 31 July 2011. 8. Final approval at 2011 meeting in China 9. An SC-A1 panel session should be considered for this topic 10. Technical brochure and Tutorial by 28 February 2012 	2012
A1.11	Guide for on-Line Monitoring of Electrical Generators	Dan Zlatanovic (Romania) Robert Fenton (US)	<ol style="list-style-type: none"> 1. Revised list of sensors by Mr Weidner by 01 December 2007. 2. Draft Technical Report by Mr. Fenton by January 15, 2008. 3. Comments to draft report by 30 April 2008. 4. Final Draft Report by 15 July 2008 for discussion and Approval at 2008 meeting. 5. Final approval by AG A1.01 and SC-A1 at 2008 meeting. This approval occurred under the 6 weeks rule with minor comments. Mr. Fenton to issue the final version incorporating comments by 30 April 2009. 6. Summary document for publication and tutorial by 30 June 2010 	2010
A1.15	Guide on Stator Water Chemistry Management	F Duffeau (Fr) R Svobda (CH)	<p>It was believed that this work was complete. However, Germany, later joined by other countries, voiced an objection. Mr Svoboda (CH) has agreed to take on a revision incorporating comments from other National Members. The proposed schedule is:</p> <ol style="list-style-type: none"> 1. Revised Draft by 31 May 2009. 2. Comments by 31 July 2009. 3. Fenton to publish final version for SC-A1 approval under 6 weeks rule by 30 April 2010 4. Approval 15 June 2010 5. Duffeau to create a Technical Brochure, Executive Summary and Abstract for Electra by 30 July 2010 6. Final review at Paris 2010 7. Power point summary by 30 October 2010 	2010
A1.16	Guide on Generator Coil Retaining Ring - A	G Coetzee (RSA)	<p>This work was viewed as complete when Germany raised some objections. The work will be revised with minor changes. The proposed schedule is:</p>	2010/11

	System Survey and General Guideline	Robert Fenton (USA)	<ol style="list-style-type: none"> 1. Document changes from Germany by 30 April 2009. 2. Final Revision issued 30 June 2010 to SC-A1 for approval under 6 weeks rule. 3. Approval 15 August 2010. 4. Fenton to present PPT summary at Paris 2010. 5. Linton/Erli to create Technical Brochure by 30 November 2010 	
A1. 22	Guide - Consideration of Duty on Windings	M. Berlamont (FR)	<ol style="list-style-type: none"> 1. First Draft of Guide by 01 August 2010 2. Comments at 2010 Biennial Session in Paris 3. Second Draft of Guide by 31 October 2010 4. Comments by 15 December 2010 5. Final Draft of Guide by 15 February 2011 6. Comments by 31 August 2011 7. Final approval at China meeting (September 2011) 8. Technical Brochure and Tutorial by 31 December 2011 	2012
A1. 23	State of the Art and Capacity for Robotic Inspection of Turbo-Generators	Marcio R. Siniscalchi (BR)	<ol style="list-style-type: none"> 1. Start: December 2009 2. TOR issued for approval - Approved 3. Scope and Outline for discussion Paris 2010 4. Draft by 31 December 2010 5. Final report: 2011 	2011

3.2. AG A1.02: HYDROGENERATORS

3.2.1. Scope and objectives

The following working groups operate under the advisory of AG A1.02:

3.2.1.1. WG A1.02: Generator Stator Winding Stress Grading Coating Problem

This working group task will be to gather the knowledge of technical people concerning the stress grading coating problem and to have an idea of the degradation of world hydro generators fleets. A survey to improve the future technical specifications will therefore be sent all over the world.

3.2.1.2. WG A1.04: Generator Fire Protection Guidelines

This working group task will be to update a former survey adding the actualized different stand points of the groups described below and to convey them to one document that will help generators to be designed with provisions to receive fire protection equipment that will be functional, environmentally sound, comply with the applicable standards, to attend the insurance companies requirements – resulting insurance costs reductions, and on the top of that giving to the owners the best possible result in case of a fire.

Groups: Generators users; Generators Manufacturers; Insurance companies and insurance brokers; Erection, commissioning, refurbishment and maintenance companies and Research Centers and Universities.

3.2.1.3. WG A1.12: State of the Art of the Efficiency in HydroGenerators Commissioned in the Last 10 years

This working group task will be collect information about efficiency and losses obtained from tests of units commissioned in the last 10 years in order to produce a statistic base. This base processed will allow to obtain the expectable efficiency for a new hydro generator as a function of its capacity and speed.

3.2.1.4. WG A1.13: Feasibility of Updating from Class F to Class H the Insulation Systems in Electrical Rotating Machines

Explore the possibility of updating the insulation systems used in rotating electrical machines by replacing class F by class H, retaining the performance and the reliability of the machines. We shall take into account two different points of view: the OEM's (Original Equipment Manufactures) and the User's point of view. The manufacturers invest a lot of money in R&D and every year develop new materials and applications. However sometimes it takes a long time for those to reach the market. Both OEMs and Users have little interest in being related to the failure of a new development or technology.

3.2.1.5. WG A1.14: Guide for Minimizing the Damage from Stator Winding Ground Faults in Hydrogenerators

Stator earth faults are the most common fault in generators, produced by the breakdown of the machine winding insulation to earth through the core of the stator. Some factors, such the method of grounding used, and de-excitation systems, will determine the damage to the stator core and to the stator windings. The meaning of earthing methods is to prevent severe damage to the core and conductor of the stator, reducing stator earth fault current as much as possible. The goal of this working group is to assess the stage and to review the stator winding grounding criteria.

3.2.1.6. WG A1.21: Bearing Segments with Plasting Lining – Operating and Maintenance Experience

The technology with plastic lined bearings segments have been studied by suppliers as well as by researchers and technical universities. Numerous papers have been produced about plastic lined bearings but as far as we know there is no survey of the users experience from operation and maintenance. There is now expected to be enough operating and maintenance experience to provide a valid basis for long term operating expectations to be shown.

3.2.1.7. WG A1.25: Survey on Hydro-generator Cleaning

The goal of this working group is to assess the different methods used for cleaning of rotor and stator and to assess the criteria used for determining when cleaning of the generator is necessary.

3.2.2. Action Plan: Present status of the activities

Advisory Convener: Remi Tremblay (CA)

Working Group	Title	Name of Convener	STATUS	Ready for Publication
A1.02	Generator Stator Winding Stress Grading Coating Problem	Remi Tremblay (CA)	1.Terms of Reference (TOR) approved by April 2008 2.Final questionnaire sent on September 18 th 2008 3.Draft report submitted by September 4 th 2009 4. A complete draft report to be presented by August 2010 5. Final report to be presented by August 2011 6 Technical Brochure forecasted for January 2012 7.Tutorial will be forecasted for February 2012	2012
A1.04	Generator Fire Protection	Alexander Gromow	1.Terms of Reference (TOR) approved on April 2008. However, this WG began his activities at the end of 2005	2011

		(BR)	2. Comparison between similar questions from the Groups 1, 2 and 6:ready. Presented at the Paris Biannual Session in 2008 – 40 pages (465 survey items) 3. Isolated analysis of Group-01 – Users: ready. Presented at SC-A1 Sydney Meeting in 2009 – 174 pages (3640 items). 4.Draft report to be issued by April/May 2010 5.Final report to be approved in Paris, 2010 6.Technical Brochure forecasted by April 2011	
A1.06	Intermittent Operation – Experience with Hydro-Generators	L.E. Kampe (SE)	Published in Electra in February, 2010. WG disbanded	2010
A1.12	State of the Art of the Efficiency in Hydro-generators Commissioned in the Last 10 years	H.D.Pires (AR)	1. Terms of Reference (TOR) Approved by December 2008 2.Draft of questionnaire version 1 issued by March of 2009 3.Comments on version 1 in progress 4.Definitive version questionnaire to be submitted by 24/4/09 5.Data processing in 2009 and 2010 6. Draft report in 2010 7. Final report by January 2011	2011
A1.13	Feasibility of Updating from Class F to Class H the Insulation Systems in Electrical Rotating Machinery	J.L.Garcia Araco (SP)	1.Terms of Reference (TOR) approved by 15 October 2008 2. Questionnaire for comments scheduled for June 2009 3.Questionnaire for comments scheduled for discussion and approval at 2009 Sydney meeting 4.Draft report in 2010 5.Final report for approval in September 2011 6. Technical Brochure forecasted for January 2012 7.Tutorial will be developed by February 2012	2012
A1.14	Guide for Minimizing the Damage from Stator Winding Grounds on Faults in Hydro-Generators	Oscar Martinez (SP)	1.Terms of Reference (TOR) approved on 16 October 2008 2. Draft Report 1: 15 February 2010 3.Comment version: August 2010 Paris Session 4.Final Report: 2011 meeting 5. Ready to be published as a Technical Brochure in January 2012 6. Tutorial ready: February 2012	2012
A1.21	Bearing Segments with Plastic Lining – Operating and Maintenance Experience	Lars-Erik Kämpe (SE)	1.Terms of Reference (TOR) approved by 1 February 2010 2. Draft questionnaire: May 2010 3. Final questionnaire: October 2010 4. Survey–answers: January 2011 5. Draft report: September 2011 6. Report finalized: March 2012 7. Final report approved: September 2012 8.Work ready to be published in Electra, as a Report, in November 2012	2012
A1.25	Survey on Hydro-Generator Cleaning	Geir Aalvik (NO)	1. First draft questionnaire: August 2010 2. Comments: February 2011 3. Second draft questionnaire: March 2011 4. Comments: June 2011 5. Final questionnaire: August 2011 6. Survey–answers: February 2012 7. First draft report: August 2012 8. Comments: 2012 Biennial Session in Paris 9. Second draft report: January 2013 10. Comments: April 2013 11. Final report: June 2013	2013

3.3. AG A1.05: NEW TECHNOLOGIES

3.3.1. Scope and objectives

The following Working Group operates under the advisory of AG A1.05:

3.3.1.1. WG A1.05: Literature Survey on Diagnostics Trends for Wind Generators for Reliability Improvement

The growing business of wind generation and the remote locations of those generating units have created a need for remote monitoring and diagnostics of those wind generators. The literature survey will focus on understanding the monitoring and

diagnostics schemes that have been in operation in this new market. Also, the survey will cover the new technologies that are being developed for those generators.

3.3.2. Action Plan: Present status of the activities

Advisory Convener: Sameh Salem (US)

WG	Title	Name of Convener	STATUS	Ready for Publication
A1.24	Literature Survey on Diagnostics Trends for Wind Generators for Reliability Improvement	S. Salem (US)	<ol style="list-style-type: none"> 1. Terms of Reference (TOR) approved on January, 2010 2. Draft report 1 to be issued by end of June, 2010 3. Presentation of Draft Report 1 at 2010 Paris Biennial Session for additional comments 4. Draft report 2 to be issued by end of December 2010 5. Comments on Draft report 2 by end of March, 2011 6. Final report for China , September 2011 7. Final report ready to be published as a Technical Brochure (TB), on January 2012 8. Summary of the TB, in PPT, to be presented as a Tutorial, on February 2012 	2012

3.4. AG A1.06: LARGE MOTORS

3.4.1. SCOPE AND OBJECTIVES

The following working groups operate under the advisory of AG A1.06:

3.4.1.1. WG A1.08: Power Station Large Motors Requirements in the Field of Standards

The working group shall prepare a questionnaire aimed at establishing if present standards are good enough in case of large motors supply. In case of negative answers suggestions are required about the more critical areas and topics in order to push competent bodies to revise and/or complete the existing standards.

3.4.1.2. WG A.17: Methods of Determining the Condition of Stator Winding Insulation and their Effectiveness

This working group shall perform a guide which covers: a brief manufacturing process theory explanation; the stator winding insulation typical defects; the insulation testing techniques theory, such as the Measurement theory, the in situ testing methodology, the diagnosis theory and the effectiveness of each technique.

3.4.1.3. WG A1.18: Extending Life of Large Motors in Nuclear Power Plants

This working group shall present a brief explanation of relevant manufacturing technologies; the list of major defects; the list of stator winding insulation typical defects; the effectiveness and limits of main investigating techniques; the possibility of

correlating different parameters in order to obtain a reliable estimation of remaining life of motors, as well the possibilities and means for extending life of existing motors.

3.4.1.4. WG A1.19: Motor Failure Survey

The most important power plant equipment, mostly driven by large capacity high voltage electric motors, poses the risk of unscheduled shutdowns because of motor failures, and high generation losses as a consequence. It is important to understand whether can be found some correlation between work conditions, load of motors, start-stop frequency, maintenance policy or other factors and large capacity HV motors failure. Based on responses to a questionnaire, statistics will be done by the working group in order to provide proper data analyses and obtain conclusions and make recommendations.

3.4.2. Action Plan: Present status of the activities

Advisory Convener: Enzo Tortello (IT)

Working Group	Title	Name of Convener	STATUS	Ready for Publication
A1.08	Power Station Large Motors Requirements in the Field of Standars	E. Tortello (IT)	<ol style="list-style-type: none"> 1. TOR approved the 11/12/2008 2. Questionnaire distributed at the same time 3. 17 answers collected from 12 countries (two countries sent multiple answers) by the end of February 2009 4. Draft report ready for comments at the end of Spring 2009 5. Results discussed in September , during Sidney meeting 6. Call for additional answers by the end of October 2009 (no additional answer received) 7. Final report ready by the end of January 2010, ready to publish 	2010
A1.17	Methods of Determining the Condition of Stator Winding Insulation and their Effectiveness	S.D. Ruiz (SP)	<ol style="list-style-type: none"> 1. TOR approved the 11/12/2008 2. Scheme of the guide (Agenda Vers. 0) and summary of each chapter June 2009 3. Agenda discussed and approved during Sidney meeting in September 4. Draft for comments by the end of June 2010 5. Discussion during Paris meeting, end of August 2010 6. Revision and final version of the report by the end of 2010 	2011
A1.18	Extending Life of Large Motors in Nuclear Power Plants	M. R. Siniscalchi (BR)	<ol style="list-style-type: none"> 1. TOR approved the 12/01/2009 2. Draft questionnaire Vers. 1 circulated in the middle of January 2009 3. 2nd draft Vers. 2 circulated in the middle of February 4. Additional comments received at the end of February to be incorporated 5. Questionnaire discussed in September 2009, during Sidney meeting 6. Final version of the questionnaire circulated in middle of October 2009 7. Draft report ready by the end of Spring 2010 8. Discussion of the draft report in Paris 2010 9. Final version of the report in December 2010 	2011

A1.19	Motor Failure Survey	V.Skundric (RS)	<ol style="list-style-type: none"> 1. Decision of restarting questionnaire during meeting in Paris 2008 2. TOR approved the 11/12/2008 3. Questionnaire recirculated in Spring 2009 4. Problem of lack of answers outlined during Sidney meeting September 2009; new answers promised 5. Collection of additional answer by the April 2010 6. Draft report by the end of June 2010 7. Discussion of the draft report in Paris 2010 8. Final version of the report in December 2010 	2011
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4. ACTION PLAN: DELIVERABLES

The table below shows the schedules foreseen for the deliverables of the working groups and task forces in the period 2010 – 2012.

Note that we have also indicated for each WG and TF the years in which they will be ready for publishing the documents produced. As we do not have the most part of the documents finished, even in a preliminary version, it may be possible that some documents classified as to be published as Reports in Electra or as Technical Brochures with an executive summary in Electra or as Reports on the SC A1 website may have another classification when they begin to receive contributions from our members and experts when we could have a better estimative of their dimensions. Nevertheless, we feel that this may not happen quite frequently so that we tried to exercise our best judgment in establishing the present classification considering the ToRs and the present status of the works.

Type of Actions is designated as follows:

- DR Draft report
- DRx Draft report version x, where x = 1,2,3,etc...
- FR Final Report to the Study Committee
- QU Questionnaire
- QUx Questionnaire version x, where x = 1,2,3,etc..
- QUF Final Questionnaire
- RE Report ready to be published in Electra
- RW Report ready to be published on the SC website
- TB Technical Brochure ready to be published with an Executive Summary in Electra
- SR Status Report
- TU Tutorial

ACTION PLAN: DELIVERABLES OF THE WORKING GROUPS AND TASK FORCES IN THE PERIOD 2010 – 2012

AG	WG/TF	Scope of work	2010	2011	2012
A1.01	WG A1.01	Guideline	DR2, DR3	FR	RE or TB, TU
	WG A1.03	Guideline	SR	DR1,DR2	FR (2013←TB,TU)
	WG A1.05	Guideline	DR1	DR2,DR3	FR (2013←TB,TU)
	WG A1.06	Field Experience	RE (published)		
	WG A1.11	Condition assessment	FR, RE,TU		
	WG A1.15	Guideline	FR,TB		
	WG A1.16	Guideline	FR,TB		
	WG A1.22	Guideline	DR1,DR2	FR	TB,TU
	WG A1.23	Survey, Experience	QU	FR,RE	
A1.02	WG A1.02	Experience update	DR	FR	TB, TU
	WG A1.04	Experience update	DR1, FR	TB	
	WG A1.12	Field experience	DR	FR	RE or TB
	WG A1.13	Experience, trends	DR	FR	RE or TB, TU
	WG A1.14	Guideline	DR	FR	TB, TU
	WG A1.21	Field Experience	QU	DR	FR,RE
	WG A1.25	Survey	QU1	QU2,QUF	
A1.05	WG A1.24	Survey, Experience	DR1,DR2	FR	TB,TU
A1.06	WG A1.08	Recommendations for Standards	RE (ready) (*)		
	WG A1.17	Experience, trends	SR	RE	
	WG A1.18	Experience	DR	FR, RE	
	WG A1.19	Experience	DR	FR, RE	

(*) – Report already sent for publication in Electra

TOTAL OF DELIVERABLES: 2010 - 2012				
Publication	Year			TOTAL
	2010	2011	2012	
TB	2	1	4	7
RE	2 (*)	4	1	7
TB or RE	-----	-----	3	3
RW	-----	-----	-----	----
RE or RW	1	-----	-----	---
TOTAL	4	5	8	17

(*) – One Report already sent for publication in Electra

5. PROGRAM FOR SESSIONS, MEETINGS, AND COLLOQUIUM

Event	2010	2011	2012
SC Meeting	Paris, France August 22-27		Paris, France August
SC Meeting and Colloquium		China Beijing Sept. 11-15 Yichang Sept. 16-18 (*)	
Regional Meetings		ERIAC, Paraguay (22 to 26/05)	

(*) Technical visit to Three Gorgeous Power Plant - Optional

Updated: April, 2010

Prepared by: Erli Figueiredo

With contributions from: Robert Fenton, Remi Tremblay, Enzo Tortello, Oscar Martinez and Sameh Salem.