CIGRE Study Committee A1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

WG* N° A1.40	**Name of Convenor :** Mark Bruintjies (ZA) **E-mail address**: BruinMA@eskom.co.za
Technical Issues # (2): 2, 8	**Strategic Directions # (3): 2**
The WG applies to distribution networks (4): No	
Title of the Group: Survey on Hydro Generator Instrumentation and Monitoring	

Scope, deliverables and proposed time schedule of the Group :

Background :

Keeping generators available on-line is a major factor in achieving maximum productivity in power generation. During operation generator components are continuously exposed to thermal, electrical, mechanical and environmental stresses. An individual or the combined effect of these stresses results in component failure in either or both stator and rotor, which if not detected, results in failure in service.

Unexpected component failure can result in forced outages and costly emergency repairs. As mitigation to prevent unexpected component failure, many power producers installed instrumentation with the goal of initiating condition monitoring programs on their generators.

A condition monitoring program is a comprehensive program of test, for evaluating the actual operating condition of the generator, as well as generator components.

Scope :

To conduct a survey on Hydro Generator Stator and Rotor Instrumentation and Monitoring equipments, with focus on:

- State of the art of existing instrumentation and monitoring systems (on-line vs. off-line systems, stand-alone vs. integrated systems, remote data acquisition), for both stator and rotor. Typical parameters to be surveyed: rotor and stator temperature (RTD-resistance temperature detector, TC-thermocouple, Thermography), stator core, ozone concentration, partial discharges, end-winding vibration, air-gap, voltage surge, bearing vibration, etc...
- Diagnosis tools and capabilities (Data Recording, Diagnostic models, Remote assistance, off-line and on-line expert systems, etc.)
- Prognostic approaches (Identification of weak components, criteria evaluation of life extension after replacement and/or maintenance activities, etc.)

Deliverables : Report to be published in Electra or Technical Brochure with summary in Electra

Time Schedule : start: December 2012 **Final report:** April 2016

- TOR approval – December 2012
- Forming of team – February/March 2013
- Draft questionnaire 1 – September 2013 (to be presented at Romania meeting)
- Comments by members and experts – December 2013
- Draft questionnaire 2 – March 2014

- Comments by members and experts – June 2014
- Final questionnaire – August 2014 (to be presented at Paris meeting)
- Survey – answers – December 2014
- Draft report 1– March 2015
- Comments by members and experts - June 2015
- Draft report 2– September 2015 (to be presented at Spanish meeting)
- Comments by members and experts – November 2015
- Final report approval – January 2016
- Document ready to be published in Electra – April 2016

Comments from Chairmen of SCs concerned : None

Approval by Technical Committee Chairman :

Date : 02/01/2013

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2
(4) Delete as appropriate

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (cf. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non technical audience