CIGRE Study Committee A1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP[1]

WG N° A1.60	**Name of Convenor:** Mark Bruintjies (ZA) **E-mail address**: BruinMA@eskom.co.za
Strategic Directions #[2]: 2	**Technical Issues #[3]: 10**
The WG applies to distribution networks[4]: Yes	
Potential Benefit of WG work #[6]: 1	
Title of the Group: Guide on economic evaluation for refurbishment or replacement decisions on hydro generators	

Scope, deliverables and proposed time schedule of the Group:

Background:

The increase in the need for electrical energy is demanding both high availability as well as maximum productivity from power plants. Operating plants at maximum productivity while still requiring plant to achieve maximum life expectancy poses reliability challenges from an asset management point of view.

In the current challenging economic environment, asset management is almost always confronted with the impact of ageing plant. Aged plant maintained using standard maintenance strategies often results in less reliable generators due to the inadequacy of these maintenance strategies to address unique problems associated with ageing. Subsequently unique non-standard strategic maintenance strategies are utilised which consider the increase or deferral of maintenance, type of repairs required or even if mothballing should be considered.

All these decisions are driven by relative costs, with an associated financial risk assessment for generator life extension versus upfront investment for refurbishment or even complete replacement.

This WG will develop guidelines and qualifying criteria in assisting Asset Management in the decision making process regarding hydro generator refurbishment or replacement.

Scope:

The WG will focus on the following:

- Overall risk management of generator plant
- Operational impact of financial decisions
- Condition monitoring requirements
- Major component risks
- Repair/replacement strategies
- Critical spare strategies
- Maintenance strategies

Deliverables:

☒ Technical Brochure and Executive summary in Electra

☐ Electra report

☒ Tutorial[5]

Time Schedule: start: January 2017 **Final Report**: February 2020

- TOR approval – May 2017
- Forming of team – June 2017
- Draft questionnaire – Sept 2017
- Comments by members and experts – January 2018
- Final questionnaire – April 2018
- Survey – answers – July 2018
- Draft report – Dec 2018
- Comments by members and experts – April 2019
- Final report – Aug 2019
- Electra publication – February 2020

Approval by Technical Committee Chairman: M. Wald

Date: 26/06/2017

Notes: [1] or Joint Working Group (JWG), [2] See attached Table 2, [3]See attached Table 1, [4] Delete as appropriate, [5] Presentation of the work done by the WG, [6] See attached table 3

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
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 (ref. 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

Table 3: Potential benefit of work

1	Commercial, business or economic benefit for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical direction
5	Guide or survey related to existing techniques. Or an update on past work or previous Technical Brochures
6	Work likely to have a safety or environmental benefit