CIGRE Study Committee A1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG [1]N° A1.67	**Name of Convenor:** Hélio de Paiva Amorim Junior (BRAZIL)
Technical Issues #[2]: 8	**Strategic Directions #[3]: 2**
The WG applies to distribution networks[4]: Yes	
Potential Benefit of WG work #[5]: 3, 4, 5	
Title of the Group: State of the Art in methods, experience and limits in end winding corona testing for Hydro Generators	

Scope, deliverables and proposed time schedule of the WG:

Background:

Predictive diagnostics of hydro generator stator insulation is of great importance. When the electrical field increases to certain levels in the region known as end winding, corona discharges may be observed with proper systems, be it through noise, light, smell or electrical methods.

Knowing this effect occur on end windings, manufacturers use specific techniques to attenuate or even neutralize it, some of which are rather effective. Environmental conditions also contribute significantly to this phenomenon. Humidity and dirt can alter the results and, consequently, the diagnosis of the insulation as a whole.

Methods for evaluating corona on windings ends are still debatable, with no consensus among professionals as for the technique, not to mention the acceptable limit values.

This Working Group aims to elaborate, through exchange of experience, a basic guide that comprises the main methods applied around the world, experience regarding the techniques, the devices and the test conditions and, finally, establish the limit values that determine the end winding corona test as acceptable or not.

Scope:

To conduct a survey on state of the art in end winding corona testing for Hydro Generators, with focus on:

1. Listing of Hydro Generators with power, age and dates of rewinding and significant winding maintenance procedures;
2. Online vs. offline testing;
3. Continuous vs. periodic measurements monitoring;
4. Different sensor types;
5. Different measuring techniques
6. Comparison between Hydro Generators with different power and ratings;
7. Comparison between corona testing and PD measurements;
8. Relation with other monitored quantities (power, vibration, temperature);
9. End winding and/or junction repairs based on corona or PD testing.

Deliverables:

☒ Technical Brochure and Executive Summary in Electra

☐ Electra Report

☒ Tutorial[6]

☐ Webinar[6]

Time Schedule: start: July 2019 **Final Report**: August 2022

Approved by Technical Council Chairman:

Date: July 12th, 2019

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

Table 1: Technical Issues for creation of a new WG

1	Active Distribution Networks resulting in bidirectional power and data flows within distribution levels up to higher voltage networks
2	Digitalization of the Electric Power Units (EPU): Real-time data acquisition includes advanced metering, processing large data sets (Big Data), emerging technologies such as Internet of Things (IoT), 3D, virtual and augmented reality, secure and efficient telecommunication network
3	The growth of direct current (DC) and power electronics (PE) at all voltage levels and its impact on power quality, system control, system operation, system security, and standardisation
4	The need for the development and significant installation of energy storage systems, and electric transportation, considering the impact they can have on the power system development, operation and performance
5	New concepts for system operation, control and planning to take account of active customer interactions, and different generation types, and new technology solutions for active and reactive power flow control
6	New concepts for protection to respond to the developing grid and different generation characteristics
7	New concepts in all aspects of power systems to take into account increasing environmental constraints and to address relevant sustainable development goals.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics
9	Increase of right of way capacity through the use of overhead, underground and submarine infrastructure, and its consequence on the technical performance and reliability of the network
10	An increasing need for keeping Stakeholders and Regulators aware of the technical and commercial consequences and keeping them engaged during the development of their future network

Table 2: Strategic directions of the Technical Council

1	The electrical power system of the future: respond to speed of changes in the industry
2	Making the best use of the existing systems
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, social and economic benefits 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 directions
5	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
6	Work likely to contribute to improved safety.
7	Work addressing environmental requirements and sustainable development goals.