CIGRE Study Committee B5

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG [1]N° B5.82	**Name of Convenor: Mladen Kezunovic** **E-mail address**: m-kezunovic@tamu.edu
Strategic Directions #[2]: 1	**Sustainable Development Goal #[3]:** 9
The JWG applies to distribution networks: ☒ Yes / ☐ No	
Potential Benefit of WG work #[4] : 2, 5	
Title of the Group: Education, Qualification and Continuing Professional Development of Engineers in Protection, Automation and Control	

Scope, deliverables and proposed time schedule of the WG:

Background:

The WG B5.40 with similar title has finished its work in 2014. Since that time, the deployment of new technologies for renewable interfacing and electric grid resilience reinforcement have introduced new grid development goals: reaching the net-zero carbon targets, while improving reliability, safety, and security. To deploy such technologies, new Protection, Automation and Control (PAC) educational and training needs have emerged spanning across several fields: advanced data analytics utilizing machine learning and artificial intelligence; inverter-based designs for grid forming and grid following controls; digital twins, synchrophasors, and digital substations for enhanced resilience; extended cybersecurity requirements, e.g. for the use of Internet of Things for Distributed Energy Resource Interfacing; advances in energy storage utilization and microgrid designs for grid support; behavioral and economic sciences for determination of the best market designs. Impact of such pervasive, yet recently emerging PAC concepts has not been considered in the WG B5.40 report and needs to be included in the educational and training curricula for future academic and industry workforce development.

Scope:

Review and update WGB.40 brochure (TB 599) with the new topics, technologically aware means of delivering knowledge including web-based learning approaches, internal utility training and skill updates, and formal education certification processes that will enable new and existing PAC workforce to achieve, maintain, and enhance the skills required to support technological changes for the next generation of the electric grid assuring that it is safe, secure, reliable, environmentally friendly, and socially equitable.

Out of scope:
The WG will not cover the Science, Technology, Engineering and Mathematics (STEM) education for primary and secondary schooling that may be a prerequisite for the educational reform to support future grid educational needs in a long run.

Remarks:
This input to the PAC community is indeed needed urgently, so the working group intends to create a report in a relatively short time frame of two years to meet the pressing industry needs to add the findings from the report to the education and training practices as soon as possible.

Deliverables:

☒ Technical Brochure
☒ Electra Report
☐ Future Connections
☐ CSE
☐ Tutorial
☒ Webinar

Time Schedule: start: February 2023 **Final Report**: Dec 2024

Approval by Technical Council Chairman:

Date: February 16th, 2023

Notes: [1] Working Group (WG) or Joint WG (JWG), [2] See attached Table 1, [3] See attached Table 2 and CIGRE reference Paper: Sustainability – at the heart of CIGRE's work. [4] See attached Table 3

Table 1: Strategic directions of the Technical Council

1	The electrical power system of the future reinforcing the End-to-End nature of CIGRE: respond to speed of changes in the industry by preparing and disseminating state-of-the-art technological advances
2	Making the best use of the existing systems
3	Focus on the environment and sustainability (in case the WG shows a direct contribution to at least one SDG)
4	Preparation of material readable for non-technical audience

Table 2: Environmental requirements and sustainable development goals

	CIGRE selected the 7 SDGs that are the most relevant to CIGRE. In case the WG work refers to other SDGs or do not address any specific SDG, it will be quoted 0.
0	Other SDGs or not applied
7	**SDG 7: Affordable and clean energy** Increase share of renewable energy; e.g. expand infrastructure for supplying sustainable energy services; ensure universal access to affordable, reliable, and modern energy services; energy efficiency; facilitate access to clean energy research and technology
9	**SDG 9: Industry, innovation and infrastructure** Facilitate sustainable infrastructure development; facilitate technological and technical support
11	**SDG 11: Sustainable cities and communities** Increase attention on sustainable and resilient buildings utilizing local (raw) materials, power for electric vehicles, strengthening long-line transmission and distribution systems to import necessary power to cities, developing micro-grids to reinforce the sustainable nature of cities; protect and safeguard the world's cultural and natural heritage; reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and waste management
12	**SDG 12: Responsible consumption and production** E.g. Promote public procurement practices that are sustainable; address reducing use of SF6 and promote alternatives, encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle, address inefficient fossil-fuel subsidies that encourage wasteful consumption
13	**SDG 13: Climate action** E.g. Increase share of renewable or other CO_2-free energy; energy efficiency; expand infrastructure for supplying sustainable energy; strengthen resilience and adaptive capacity to climate-related hazards and natural disasters; integrate climate change measures into national policies, strategies and planning; improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
14	**SDG 14: Life below water** E.g. Effects of offshore windfarms; effects of submarine cables on sea-life
15	**SDG 15: Life on land** E.g. Attention for vegetation management; bird collisions; integration of substations and lines into the landscape

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.

Comments:

1) CIGRE Official Study Committee Rules re WG Membership:
https://www.cigre.org/GB/about/official-documents
No more than one member per country unless by SC Chair exception.
WG nominees must first be supported by their National Committee (or local SC Member) as an appropriate representative of their country.
Acceptance of the nomination is granted by the SC Chair and advised to the WG Convener

2) CIGRE will provision a dedicated Space for the Working Group in the Knowledge Management System. The WG will use the KMS for drafting collaboration, capture and retention of discussion and meeting records. WG Members will be sent registration instructions by the Convener.
https://www.cigre.org/article/GB/collaborative-tools-2