CIGRE Study Committee C2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG [1]N° C2.18	**Name of Convenor:** Walter Sattinger (Switzerland) **E-mail address**: walter.sattinger@swissgrid.ch
Strategic Directions #[2]: 1	**Sustainable Development Goal #[3]: 9**
The WG applies to distribution networks: ☐ Yes / ☒ No	
Potential Benefit of WG work #[4] : 5	
Title of the Group: Wide Area Monitoring Protection and Control Systems – Decision Support for System Operators	

Scope, deliverables and proposed time schedule of the WG:

Background:

Wide Area Monitoring has been in use worldwide for more than fifteen years within TSOs environments, and a lot of experience has been accumulated. Consequently, the measurement technology has developed through on-going fruitful dialogue between TSOs, manufacturers and universities. However, the final goal of integrating **W**ide **A**rea **M**onitoring **P**rotection **a**nd **C**ontrol (WAMPAC) system capabilities into TSOs standard operation and monitoring processes has not been fully achieved, and the uptake of WAMPAC systems varies significantly between TSOs. Therefore, it is important to increase the benefit gained by TSOs by presenting experience and pragmatic approaches that encourage more intensive use and increases the accessibility and uptake of the technology.

In the Technical Brochure 750 delivered by the WG C2.17 the expectations and needs of control room staff were addressed and formulated, in order to elaborate the added value of using WAMPAC systems. Different ways of dynamic system analysis were presented by examples of a wide range of applications. The current applications generally offer decision support, dedicated warnings and control measures for control room operators and off-line analysis personnel, including operational planning and post-mortem analysis. The Technical Brochure 664 describes the PMU measurement technology and telecommunication details as well as system protection schemes in a comprehensive way. In order to ensure a close cooperation with SC B5 a corresponding liaison member will support the C2.18 working group.

Scope:

The activities of the WG will focus on:

1. Identifying already acquired experience and practices for control room applications with the use of WAMS and WAMPAC systems.
2. Describing the possibilities for flexible and scalable PMU data and WAMPAC systems by sharing the architecture and data within interconnected TSOs.
3. Identifying possibilities for standardization recording and event analysis.
4. Describing a process for TSOs to relate WAM system observation for the control room by interfacing with EMS, SCADA or Data Base systems.
5. Develop recommendations regarding dedicated alarm sets for control room measures to be applied based on WAMPAC tools applications, referencing type of phenomenon and power system characteristics.
6. Identifying possibilities of using PMUs within special protections systems (SIPS) and defense schemes and the power system emergency operation mode with WAMPAC system support.

7. Investigate the use of WAMPAC systems as input for HVDC links or inverter-based generation or loads with control capability for various requirements such as AC load following, transient stability, voltage stability, frequency control, frequency stability, dynamic Mvar control, critical RoCoF detection.
8. Testing and validation of the new concepts and approaches, use of WAMPAC tools for component compliance/conformity testing.
9. Establishing a standard for recommended minimum requirements for communication channels for both WAMS and WAMPAC applications.
10. Recommending areas for further research and development, in order to gain new insights.

Deliverables:

☒ Technical Brochure and Executive Summary in Electra
☐ Electra Report
☐ Future Connections
☐ CSE
☒ Tutorial
☐ Webinar

Time Schedule: start: July 2020 **Final Report**: July 2022

Approval by Technical Council Chairman:

Date: July 3rd, 2020

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.