CIGRE Study Committee D2

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

WG N°D2.44	**Name of Convenor :** Alexandre Pinhel (Brazil) **E-mail address**: pinhel@gmail.com
Strategic Directions #[2]: 1	**Technical Issues #[3]:** 2
The WG applies to distribution networks[4]: Yes	
Potential Benefit of WG work #[6]: 1,2 and 3	
Title of the Group: Usage of Public or Private Wireless Communication Infrastructures for Monitoring and Maintenance of Grid Assets and Facilities	

Scope, deliverables and proposed time schedule of the Group:

Background:

Wireless communication services delivered over either public or private infrastructures open the way for many new monitoring and maintenance applications in the power system. Large scale collection of non-time-critical data across the grid renders possible a more proactive approach to asset life-cycle management and to the monitoring and surveillance of technical sites. Field worker personal communication terminals may be used for local wireless connection to intelligent substation assets for identification, status collection, or local measurements. The field worker may connect to remote data servers for obtaining further information on the asset or on the larger system in order to undertake more appropriate actions. Still the same field worker may need technical support and more specific expertise, inside or outside the utility perimeter, and may hence connect through his terminal to central support platforms. Communication is a central issue in all these contexts: reachability with adequate throughput is the enabling factor for new operation processes in the asset maintenance and system monitoring paradigm

Scope: The scope of this working group is to produce guidelines for assessing wireless service provisioning alternatives in each specific context and defining corresponding communication architectures. A non-exhaustive list of subjects and issues to be treated in the WG is given below.

1. Architectural Framework for Monitoring and Maintenance Communications
2. Field worker communications for interaction to other field workers, to support platform, and to Control Centre
3. Local wireless in the substation/plant and upload/download of asset data
4. 2G/3G/4G Cellular for monitoring and maintenance
5. TETRA and other Private Mobile Radio in the power system
6. Applicability of Industrial Internet of Things (IIOT) concepts
7. Low speed/power public wireless services (LoRA, SigFOX …)
8. Cyber-security issues and potential solutions to overcome the cyber-risks
9. Use cases covering potential applications, constraints and processes implemented or planned across the EPU community

Deliverables:

☒ Technical Brochure and Executive summary in Electra

☒ Electra report

☒ Tutorial[5]

Time Schedule: start: April 2017 **Final Report**: October 2020

Approval by Technical Committee Chairman:

Date: 20/03/2017

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