

CIGRE Study committee D2
PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG D2.62

NAME OF THE CONVENOR

Fuyou Sun (CHINA)

TITLE

Efficient spectrum allocation and utilisation for electric power industry private communication networks

THE WG APPLIES TO DISTRIBUTION NETWORKS: YES

ENERGY TRANSITION

3 / Digitalization

5 / Grids and Flexibility

POTENTIAL BENEFIT OF WG WORK

1 / commercial, business, social, economic benefits

STRATEGIC DIRECTION

2 / Making the best use of the existing systems

SUSTAINABLE DEVELOPMENT GOAL

9 / Industry, innovation and infrastructure

BACKGROUND :

With the construction and development of smart grids, power systems have higher requirements for communication. A reliable, high-speed, and secure communication network is required to support the monitoring, control, and management of power equipment.

For such communication networks, private wireless networks could be a good option, enabling a relatively fast rollout of the communication infrastructure to presently uncovered locations.

Private wireless communication networks are owned and operated privately by a utility, isolated and independent from the cellular wireless networks provided by telecommunications carrier companies.

The key problem of private wireless networks is the need for wireless spectrum. With the wide application of wireless communication technologies, spectrum resources are increasingly in demand. Therefore, spectrum allocation (frequency bands) needs to be properly planned to meet the requirements of different industries.

The power system has high security, availability, reliability, and performance requirements and requires spectrum to enable stable and secure power grid application-related communication networks.

Spectrum availability can provide a reliable communication guarantee, ensure the real-time monitoring and control of power equipment, and improve the security and stability of the power system.

Wireless networks can support high-speed and large-capacity data transmission, support the construction and development of smart grids, and improve the intelligence level of power systems.

Efficient allocation and utilisation of spectrum can promote technological innovation and industrial upgrading in the electric power industry and promote the sustainable development of the electric power industry.

Electricity is an important part of national energy. Efficient allocation and spectrum utilisation can ensure the safe and stable operation of power systems and support national energy security.

To sum up, the Electric Power Industry's requirements for wireless spectrum are significant, as they can strongly support the further development of power systems applications and contribute to national energy security.

PURPOSE / OBJECTIVE / BENEFIT OF THIS WORK :

The objective of the working group is to provide a Technical Brochure (TB) on the efficient allocation and utilisation of spectrum for electric power industry, which includes the following:

1. Spectrum requirements analysis
2. Shared and dedicated spectrum options
3. Spectrum planning and allocation
4. Spectrum efficiency improvement
5. Spectrum interference management including the impact of intentional jamming
6. International spectrum coordination and synchronisation with the other organisations working on spectrum
7. Review of Standards
8. Industry development promotion
9. Policy and decision-making

In summary, the purpose of the TB is to provide reasonable guidance on planning, allocation, and effective utilization of spectrum resources for the power industry and ensure the secure and stable operation of power systems' wireless communication. The TB contents include spectrum demand research, spectrum planning and allocation trends, spectrum efficiency improvement technologies, spectrum interference management, international spectrum trends, standards review, and policy advice.

SCOPE :

The scope is as follows:

1. In-depth understanding of various application scenarios of the electric power industry, including smart grids, distributed energy, and electric vehicle charging, and analysis of the characteristics and scale of spectrum requirements.
2. Spectrum planning and allocation: Propose spectrum planning and allocation methods suitable for the electric power industry and propose reasonable spectrum allocation solutions based on limited spectrum resources and special requirements of the electric power industry.
3. Spectrum efficiency improvement technologies: Explore technologies and methods for improving spectrum efficiency, such as spectrum reuse, spectrum sharing, and cognitive radio, to improve the utilization of spectrum resources.
4. Spectrum interference management: Study generation mechanism and impact of spectrum interference and propose effective spectrum interference management strategies and technical measures to ensure the normal operation of the power communication system.
5. International spectrum coordination: Include the latest developments and trends of international spectrum management.
6. Standards review: Review open international standards affecting efficient utilisation of spectrum, review application and implementation of standards, and propose standardized management and utilization of spectrum resources in the power industry.
7. Industry development promotion research: Provide technical guidance for spectrum application in the electric power industry.
8. Policy advice and decision-making.

DELIVERABLES AND EVENTS

Deliverables Types

Annual progress and activity report to Study Committee
CSE
Electra report
Meeting
Technical Brochure and Executive Summary in Electra
Tutorial
Webinar

Deliverables schedule

Meeting	Q4	2024	Membership recruitment
Meeting	Q1	2025	Detailed work plan development
Technical Brochure	Q1	2026	Draft TB for SC Review
Technical Brochure	Q3	2026	Final TB
Tutorial	Q1	2027	Tutorial
Webinar	Q2	2027	Webinar

APPROVAL BY TECHNICAL COUNCIL CHAIRMAN:

Rannveig S. J. Løken
January 13th, 2025