

CENELEC/TC or SC	Secretariat	Date
TC 57	Germany	2018-09-11

TC title: Power system management and associated information exchange

A Background

To implement the European smart grid concepts, the European electricity market, and the European Network Codes as well as to ensure interoperability and compliance with European Regulations, standards are of utmost importance. Gaps between existing standards have been identified through the M/490 mandate from the European Commission by the European Standardization Organizations CEN, CENELEC, and ETSI.

This document focuses on the power system management and associated information exchange.

In the past years, work carried out within TC 57 enables to cover some gaps such as:

- The IEC/EN 61850 series for substation automation and data acquisition.
- The IEC/EN 62325-451 series on electricity market in compliance with CACM (Capacity Allocation and Congestion Management) Network Code, EC Regulation 543/2013 (Transparency) and EC Regulation 1227/2011 (Wholesale energy market).
- The IEC TS 61970-600 series on network calculation in compliance with SOGL (System Operations Guidelines) Network Code.
- In addition, the 'Clean Energy Package' (new European Regulation) will create new requirements imposing new exchanges between actors. CLC TC57 will be in a position to promote new standards for their implementation in order to allow the conformity to them.

Scope of TC 57:

To capture the standardization needs which be expressed by the CENELEC TC 57 (CLC TC 57) stakeholders such as the European Commission, European Regulators, Transmission System Operators (TSOs), Distribution System Operators (DSOs), Nominated Electricity Market Operators (NEMOs), electricity customers and manufacturers in order to enable an efficient electricity market, secure power system operations and in particular seamless interoperability between all the parties and IT systems.

As per the Frankfurt agreement, work item will be first submitted to IEC TC 57 for drafting the International Standard and if not accepted CLC TC 57 will organize the work to develop the European Norm.

CLC TC 57 focuses on power systems control and equipment, including MMS (Market Management System), EMS (Energy Management System), DMS (Distribution Management System), SCADA (Supervisory Control And Data Acquisition), DERMS (Distributed Energy Resources Management Systems), power system automation, protection/teleprotection and associated information exchange for real-time and non real-time information, used either in designing and planning power system (transmission or distribution), system operation (transmission or distribution), market operations (electricity market, balancing, flexibility, congestion management, distributed energy resources, settlement, customer management, metering and billing, etc.), and asset management including maintenance of power system.

Power systems management comprises control within control centers, substations and individual pieces of primary equipment including telecontrol and interfaces to equipment, management systems (Market, Energy, Distribution, etc.) and databases, which may be outside the scope of TC 57.

Note 1: Standards prepared by other technical committees of the CENELEC and organizations such as CEN and ETSI shall be used where applicable, as far as these standards or specifications fit consistently to TC 57 communication architecture and UML models (CIM and IEC/EN 61850).

Note 2: Although the work of TC 57 is chiefly concerned with standards for electric power systems, these standards may also be useful for application by the relevant bodies to other geographical widespread processes.

Note 3: Whereas standards related to measuring and protection relays and to the control and monitoring equipment used with these systems are treated by IEC TC 95, CLC TC 57 deals with the interface to the control systems and the telecommunication aspects for teleprotection systems. Whereas standards related to equipment for electrical metering and load control are treated by IEC TC 13, CLC TC 57 deals with the interface of equipment for interconnection lines and consumers and producers requiring energy/distribution management type interfaces to the control and market systems.

Note 4: CLC TC 57 deals with the information exchanges between the market participants and grid users related to the operation of the electricity market and in particular to comply with the European Regulations and Network Codes requirements.

B Business Environment

B.1 General

CLC TC57 has in its scope recognised core standards of the IEC, namely the Common Information Model (IEC/EN 61968, IEC/EN 61970 and IEC/EN 62325 series) and IEC/EN 61850 series, and these standards have been recognized as pillars for delivering interoperable and cyber-secured Smart Grids for the future.

The increasing competition among electric utilities due to e.g. the deregulation of the energy markets asks more and more for the integration of equipment and systems for controlling the electric power process into integrated system solutions for supporting the utilities' core processes. Former closed energy management systems will be opened to be able to exchange information with external systems not only for the planning, operation and maintenance of power systems but as well with business systems of system operators to optimize the use of the power system in the energy market. Consumers and distributed generation will increasingly play an active role in the power system management. Therefore, equipment and systems have to be interoperable, and interfaces, protocols and data models must be compatible to reach this goal.

Although IEC/EN TC 57 standards are widely used throughout the world, there is an increasing emphasis in working in the European Community to propose European view at the International level.

Due to the recent action in Europe through the M/490 mandate on smart grid, it is becoming increasingly important to encourage European companies to devote adequate resources to the preparation of relevant European standards to meet the new smart grid requirements. The final goal for Europe will be to make proposals and support this technology at the IEC level.

B.2 Market demand

The customers of the standards developed by TC 57 are the power industry, the vendors of power systems control, protection and automation solutions or electricity market solutions, the market participants (TSOs, DSOs, NEMOs, customers, traders, regulators, etc.).

The standards developed by IEC/CLC TC 57 are widely used worldwide (e.g. IEC/EN 61850 series, IEC/EN 60870-5, IEC/EN 60870-6 series and IEC/EN 61968, IEC/EN 61970, IEC/EN 62325 series) and there is an increasing demand for recently issued standards on cybersecurity (e.g. IEC/EN 62351 series).

B.3 Trends in technology

The fast development of information and communication technology (ICT) has an impact on the work of CLC TC 57. CLC TC 57 needs to carefully observe this development in order to early pick up possible solutions and to strive for short implementation times for the standards.

Metering is increasingly becoming the source of data required for electricity market, e.g. for settlement and billing.

B.4 Market trends

The market asks for interoperable, scalable and future proof products and solutions as well as for implementation and conformity to Regulations requirements. In the Smart Grid context, interoperability is seen as key enabler for automated power systems. Therefore, CLC TC 57 has to adopt these market requirements into the current and future standardization work.

New business products will require new information exchanges between market participants, such as flexibility or frequency procurement and control (Automatic Frequency Restoration Reserve,

Manual Frequency Restoration Reserve, Replacement Reserve); reviewing European Network Codes requirements will be a primary source of requirements.

B.5 Ecological environment

Not applicable to the current work programme of CLC TC 57.

B.6 Involvement of societal stakeholders

Work and deliverables of CLC TC 57 consider and support the deployment of smart power management system needed to achieve the 20-20-20 goal of Europe.

Of course, expectations from associations of electrical utilities, electrical manufacturers should be welcome to have efficient work on standards for power system management and associated information exchange.

B.7 Involvement of SMEs

Up to now, standards for power systems control equipment, automation and protection equipment are mainly targeting equipment manufacturers and laboratories and generally, these products are partly built and used also by Small or Medium Enterprises.

C System approach aspects

CLC TC 57 will actively continue to promote the establishment of liaisons to other committees, cooperation with system committees and beneficial liaisons targeted to new emerging technologies are in our focus.

D Objectives and strategies (3 to 5 years)

Objectives and strategy for the future work of CLC TC 57 are derived from the following 5 major aspects of the business environment:

- Shortage of energy resources and increasing energy costs require efficient energy usage and optimization of energy management processes.
- Conversion of the power system for the increasing integration of renewable energy resources.
- By the decoupling of power generation, transmission and distribution, different actors need to communicate and interact along the value chain.
- The fast progress in information and communication technologies
- Strong demand for cyber security for the grid as critical infrastructure

Objectives:

- Provide smart grid interoperability standards for power system management and operation complying with European Regulations and Network Codes.
- Propagate and promote IEC/EN 61850 as the Smart Grid core communication standard for power system automation of field devices and systems, both within and outside of substations (e.g. for distribution automation, distributed energy resources, monitoring and control in hydroelectric power plants and wind turbines).
- Propagate and promote the use of IEC/EN 61968, IEC/EN 61970 and IEC/EN 62325 CIM standards for operation, asset management and market level, Smart Grid functions both within an individual utility enterprise as well as between utilities, transmission system operators (TSOs), distribution system operators (DSOs), market participants, customers, producers, regulators, etc.
- Create the appropriate standards to implement the Clean Energy Package.
- Ensure interoperability and compatibility of IEC/EN TC 57 standards in the long term, including backward compatibility, migration strategies and paths for legacy protocols.
- Provide standardized communication means for system operators and other market participants to interface to the liberalized energy market, by allowing the multiple technologies to hide from the applications and by extending the Common Information Model (CIM) for the market place needs.

- Provide guidelines and standards addressing the more active role of consumers in managing loads and distributed energy resources, using CIM and IEC 61850 as appropriate.
- Promote use of IEC/EN 62351 addressing cyber security issues.

Strategy:

- Apply use case and requirements oriented approach for standards development.
- Open proprietary structures by standardization of data exchange interfaces among IT systems and software applications, avoid to standardize applications themselves.
- Use of state of the art standard information and communication technology platforms wherever available and applicable.
- Ensure quality and consistency of CLC TC 57 standards portfolio.
- Ensure that IEC standards are compliant with European Regulations otherwise develop the necessary European norms.

E Action plan

Concentrate on speedy completion of projects, under consideration of making complex standards manageable, making standards transferable to neighbouring smart grid domains, and ensuring high quality and consistency. For detailed actions, refer to working program.

F Useful links to CENELEC web site

TC home page giving access to Membership, TC/SC Officers, Scope, Publications, Work programme [password-protected area].

https://www.cenelec.eu/dyn/www/f?p=104:7:0:::FSP_ORG_ID:1258723