



CIGRE Study Committee B5

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP (1)

WG* N° B5.50	Name of Convenor: Patrik Lindblad (FI) E-mail address: <a href="mailto:Patrik.Lindblad@fingrid.fi">Patrik.Lindblad@fingrid.fi</a>
Technical Issues # (2): 10 /	Strategic Directions # (3): 1,2
The WG applies to distribution networks (4): Yes	
Title of the Group: IEC 61850 Based Substation Automation Systems – Users Expectations and Stakeholders Interactions	
<b>Scope, deliverables and proposed time schedule of the Group:</b> <b>Background :</b> IEC 61850 has gained growing importance since the publication of its first edition at the beginning of the last decade. The Substation Automation System (SAS) of several thousand substations in service is based on IEC 61850, with a continuous growth. Its main objective is to allow interoperability between IEDs of different vendors in one SAS. This scope is at this moment being extended well beyond the limits of a substation. With its promised benefits at the level of substation engineering efficiency (IEC61850 is not only a simple protocol), IEC61850 will be without any doubt THE standard applied in SAS worldwide, as in many other domains.  Nevertheless, several reports and positions papers have been published pointing out particular difficulties of transmission users trying to design, configure, test and maintain IEC 61850 systems. Two main issues remain: the current level of interoperability of the standard and the complexity level of its implementation for the users.  There is a common agreement that it should be possible to acquire the IEC61850 standard knowledge and to apply the standard in a straightforward way without having to go through an extended "trial-and-error" stage. Widening the base of users of IEC 61850 beyond a quite restricted circle of specialists also may require working on recommended ways to apply the standard. Moreover, it appears to be necessary to clarify the task of the different actors in the framework of an IEC 61850 based SAS. Last but not least, the growth of the standard and the number of domains that it currently covers could sometimes unbalance the standard by giving it too much flexibility in the prejudice of its interoperability. Some work-around should be examined therefore, like users profile definition or implementation agreements for instance.  This Working Group is the CIGRE B5 contribution to this effort of clarification with as main objective to strengthen the IEC61850 standard, taking into account the users expectations.  <b>Scope :</b> The aim of the Working Group is to produce a Technical Brochure <ul style="list-style-type: none"><li>• helping new users to acquire the required knowledge to be able to implement the new standard solutions flawlessly and in a technically and economically optimized way,</li><li>• identifying frequent mistakes and proposing some workaround in order to avoid them,</li></ul>	



- giving input for the IEC 61850 standardization process and for the vendors to develop their solutions to be more interoperable than today,
- taking into account the complete lifecycle of the SAS for the different items.

The Technical Brochure will cover the following items:

1. Clarify expectations between users, vendors and system integrators related to the standard IEC 61850.
2. List and explain the duties, roles and the required level of knowledge of the 61850 system integrators, users and vendors.
3. Understand specification and flow of information between users and system integrators, in particular: interfaces, definition of applications and required performance.
4. Based on experience of the different actors,
  - describe some Use Cases having encountered difficulties,
  - analyze the reasons for these problems,
  - propose solutions, work-around and / or input proposals for the ongoing standardization work.

Publications by users in the past years should be reviewed and integrated in the use cases.

The previous Technical Brochures produced by CIGRÉ will be kept in mind before starting the work of this current working group, especially:

- TB 466: Engineering Guidelines for IEC 61850 Based Digital SAS
- TB 329: Guidelines for specification and evaluation of substation automation systems
- TB 326: The introduction of IEC61850 and its impact on protection and automation within substations

**Limitation of the scope:**

- IEC 61850 integration and interfacing with CIM are not covered by the WG (ongoing IEC TC57 WG19)
- The WG should not focus on the tools to create or manipulate IEC 61850 files, but may state some requirements for these tools.

**Deliverables**

- The Technical Brochure (TB)
- A 60 words Abstract of the TB
- An Executive Summary of the TB
- A Tutorial presenting information in the TB

**Time Schedule: Start:** 1<sup>st</sup> quarter 2013 **Final report:** 2020

**Comments from Chairmen of SCs concerned :**

**Approval by Technical Committee Chairman :**

**Date :** 11/11/2012

- (1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2  
(4) Delete as appropriate

Rev a: 14/02/2020: Change of Convener and finish date



**Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)**

<b>1</b>	Active Distribution Networks resulting in bidirectional flows within distribution level and to the upstream network.
<b>2</b>	The application of advanced metering and resulting massive need for exchange of information.
<b>3</b>	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.
<b>4</b>	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.
<b>5</b>	New concepts for system operation and control to take account of active customer interactions and different generation types.
<b>6</b>	New concepts for protection to respond to the developing grid and different characteristics of generation.
<b>7</b>	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
<b>8</b>	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
<b>9</b>	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.
<b>10</b>	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 (cf. Electra 249 April 2010)**

<b>1</b>	The electrical power system of the future
<b>2</b>	Making the best use of the existing system
<b>3</b>	Focus on the environment and sustainability
<b>4</b>	Preparation of material readable for non technical audience