



IEC 61850 is growing

The family of IEC 61850 standards is considerably prospering. It was decided within TC 57, that **all publications related to the IEC 61850 technology will be published under the number IEC 61850**. As a consequence, some work that has started with a different project number got a new number within the IEC 61850 range.

As an example, object models for the control of hydro power plants that have been developed by WG18 have been published as IEC 61850-7-410 and not as IEC 62344, which was the originally assigned number.

Similar, WG17 of TC57 has prepared object models for distributed energy resources (DER) based on logical nodes. This will be published this year as IEC 61850-7-420. The numbering scheme that has been applied is the following: all documents that apply to multiple domains have a single digit as the last element of the part indication – examples include IEC 61850-7-3 or IEC 61850-6; both of these documents contain elements that apply for multiple domains or are not domain specific at all. Domain specific documents have three digits, the last two digits indicating the domain. So far, 00 has been reserved for substation, 10 for Hydro and 20 for DER.

Since with the inclusion of domains other than substations the scope has been enlarged, the title of the IEC 61850 series needed to be adopted as well. While originally IEC 61850 was published under the title “Communication networks and systems in substations”, the new

title is “Communication networks and systems for power utility automation”.

To explain the use of the logical nodes to model application functions, a new set of technical reports will be prepared with the number IEC 61850-7-5xx. Currently in preparation is IEC 61850-7-500: “Use of logical nodes to model functions of a substation automation system”.

Today, IEC 60870-5-101 / -104 is widely used as communication standard between substations and control centres. As a consequence, the mapping from IEC 61850 to IEC 60870-5-101 / -104 communication in a gateway is a frequent task. To simplify the engineering for such a mapping, it was decided to prepare a technical specification that describes this mapping. That specification will be published as IEC 61850-80-1.

For the future, it is however intended to use IEC 61850 as communication protocol towards the control centre. In principle, the protocol can be used as is for that purpose. There are however issues that need consideration. The control centre may directly access the IEDs within the substation; frequently for practical reasons, an access through

the gateway acting as a proxy may be appropriate. That proxy may supply the information as it is provided by the IED or the proxy may do some processing like e.g. rescaling of analogue values or renaming of the object. Redundancy concepts are important as well. All these issues are currently discussed in a task force of WG19. The results will be published as a technical report IEC 61850-90-2: “Using IEC 61850 for the communication between substations and control centres”. Issues requiring standardisation will later be incorporated into the related IEC 61850 parts.

A similar activity is done in a task force of WG10 concerning the communication between substations. The scope here are protection functions like distance protection with permissive and blocking schemes, current differential protection or transfer tripping as well as control functions like interlocking or multi-phase autoreclosing for parallel lines. The result will be published as a technical report IEC 61850-90-1.

So please watch out for a couple of new drafts of the IEC 61850 series that will soon be circulated within IEC. Your feedback as experts is important!

Christoph Brunner graduated as an Electrical Engineer at the Swiss Federal Institute of Technology in 1983. He is President and Chief Technology Officer of UTInnovation in Zug, Switzerland. Before, he worked as a project manager at ABB Switzerland Ltd in the business area Power Technology Products in Zurich where he was responsible for the communication architecture of the substation automation system. He is Convenor of working group (WG) 10 and member of WG 17, 18 and 19 of IEC TC57. As a member of IEEE-PES and IEEE-SA, he is active in several working groups of the IEEE-P5SRC. He is International Advisor to the board of the UCA International Users Group.