History of IEC 61850

Welcome note of Christoph Brunner to the 10 year celebration in Klaus / Austria on September 1st, 2005.

It was in November 1995 when the working groups 10, 11 and 12 of IEC TC57 met for the first time in Baden. Since then, 10 years have passed with about 60 working group and editor meetings. We produced over 1000 pages of IEC standards and we have learned a lot from each other.

We have learned, how to have fruitful discussions in order to find compromises – and we have learned a lot from a technical viewpoint. When we started, many of us did not know MMS and TCP/IP and did not understand object oriented modelling. Now, we are all experts in these domains…

We can be proud, of what we have achieved. Yesterday, we could visit the first two substations built with products using IEC 61850. IEC 61850 is not only requested and being installed in already quite many projects. IEC 61850 is also on the way, to be used in other domains than the substation automation.

Let us have a short look back, on how we got to the point where we are now. This may be of interest both for those of you, that joined recently our groups, to show, how we started, as well as for those of you that have left the activities in the past, to show, where we are today.

All started in the fall of 1993 at the plenary meeting of TC57 in Sydney. Germany issued a green paper asking to start investigating in standardisation for substation automation. Based on that, a AHWG was installed.

The AHWG met four times:

March 94	Dortmund, Germany
June 94	Lugano, Switzerland
September 94	Atlanta, U.S.
January 95	Paris, France

As a result, three new work item where presented in Mai 95 to the TC57 plenary in Minneapolis (US). In Minneapolis it was decided, to install three working groups, WG10, 11 and 12 to deal with the new work items.

The AHWG continued the work, in order to finalize IEC 60870-5-103 as a short term solution for the informative interface of protection relays. It met as follows:

February 95	London, U.K.
June 95	Madrid, Spain

The working groups 10, 11 and 12 started with a series of meetings:

November 95	Baden, Switzerland	
January 96	San Francisco, U.S.	
May 96	Vienna, Austria	
July 96	Bilbao, Spain	WG10 / WG12
October 96	Paris, France	
January 97	Madrid, Spain	WG11
March 97	Nürnberg, Germany	WG10 / WG12
April 97	Washington, U.S.	Coordination WG10 / WG11 / WG12

After a more than one year of work, it was figured out, that the work of the different working groups required more coordination. Therefore, a coordination meeting was held in Washington. At that meeting, the basic document layout of IEC 61850 was decided and it was agreed that some of the work would be done in joint task forces.

In the next meeting in Banff, the layered approach for the data modelling (Part 7-4 / 7-3 and 7-2) was decided. A series of meetings followed, until the first CD (Part 4) was published in February 98:

July 97	Banff, Canada	
October 97	Edinburgh, U.K.	
January 98	Atlanta, U.S.	Harmonization UCA / IEC 61850
February 98	Tampa, U.S.	Strategic Meeting IEEE / IEC

In the January Meeting in Atlanta, the technical aspects of the harmonization where proposed. In the meeting in Tampa, IEC and IEEE delegates agreed that all further activities shall be done in the context of IEC 61850 and the current state of UCA2.0 shall be published as IEEE TR1550.

In 1998, prior to the publication of parts 1 to 5 and 7 as 1ST CD in February / March 1999, a series of meetings was required:

March 98	San Diego, U.S.	
April 98	Zurich, Switzerland	Editor Meeting
Mai 98	Berlin, Germany	Editor Meeting
June 98	Tamsvik, Sweden	
July 98	Burgthann, Germany	Editor Meeting
September 98	Atlanta, U.S.	Editor Meeting
October 98	Antibes, France	
December 98	Ann Arbor, U.S.	Editor Meeting

In the mean time, WG12 had to deal with the issue of TC38 / WG25 defining its own standard for a digital interface to non conventional sensors. With two coordination meetings and a WG12 meeting, the concept of IEC 61850-9-1 as a compromise between the data encoding of TC38 and the use of Ethernet was developed.

August 98	Amsterdam, The Netherlands	Coordination WG12 / TC38
December 98	Frankfurt, Germany	WG12
September 99	Paris, France	Coordination WG12 / TC38

In June 99, the first CD of IEC 61850-9-1 was published; at the meeting in September 99. TC38 agreed with the approach of IEC 61850-9-1 and it was decided to include a reference to this standard in IEC 60044-8.

To prepare the second CD of part 7, the following meetings followed:

March 99	Rome, Italy	
June 99	Weggis, Switzerland	Editor Meeting
July 99	Seattle, U.S.	
November 99	Berlin, Germany	
December 99	Atlanta, U.S.	Editor Meeting
March 00	Orlando, U.S.	
April 00	Chicago, U.S.	Modelling Workshop with Experts
Mai 00	Arnhem, The Netherlands	Modelling Workshop and WG12

The second CD of Part 7 was published in June 2000. The first CDV (Part 3 and 4) where published in April 2000.

On the way to the CDV of part 7, the following meetings took place:

August 00	Ann Arbor, U.S.	Editor Meting
September 00	Lyon, France	WG12
October 00	Ann Arbor, U.S.	Editor Meeting
November 00	Valencia, Spain	
December 00	Weggis, Switzerland	Editor Meeting
January 01	Cocoa Beach, U.S.	Editor Meeting

The CDV of part 7 was published in February and March 2001.

In the mean time, work on other parts including the mappings continued:

March 01	Klaus, Austria	
June 01	Detroit, U.S.	Editor Meeting
October 01	Philadelphia, U.S.	

The first FDIS (Part 3 and 4) was published in October 2001, the first CD of part 6 in November 2001 and the first publication (Part 3 and 4) in January 2002. Also in October 2001, the second CD of part 8-1 and the first CD of part 9-2 where published.

Next meetings:

December 01	Aegeri, Switzerland	Editor Meeting
December 01	Nuremberg, Germany	Modelling Workshop Protection
January 02	Zug, Switzerland	Editor Meeting
March 02	Raleigh, U.S.	
June 02	Livonia, U.S.	Editor Meeting
July 02	Detroit, U.S.	Editor Meeting
August 02	Helsinki, Finland	

Between November 2002 and January 2003, Part 7 was issued as FDIS. In February 2003, the first CD of part 10 was published. Between May and July 2003, Part 7 was published as IS. Due to delay, Part 8-1 and 9-2 had been put back to the NWIP state by IEC. The NWIP with a CDV attached where published in October 2002 (9-2) and March 2003 (8-1).

For the finalization of the remaining parts, the following meetings took place:

June 03	Arnhem, The Netherlands	
July 03	Livonia, U.S.	Editors
October 03	Madison, U.S.	Part 10

Between November and December 2003, the remaining parts 6, 8-1 and 9-2 where published as FDIS; part 10 was published as CDV in January 04.

Major work on IEC 61850 being completed, the TC57 plenary in Montreal decided to merge the WG10, 11 and 12 into the WG10. WG10 got a new title “Power system IED communication and associated data models”.

In the meantime, new work items based on IEC 61850 where proposed: extension for power quality and use of IEC 61850 for distributed energy resources and for control of hydro power plants. While the first item was assigned to WG10, the two others where assigned to the new WG17 and WG18. In December 03, the task force on power quality met for the first time. WG10 started with the revision of IEC 61850. In July 2004, WG10 met for the first time together with WG17 and WG18. From there on, all meetings where joint meetings WG10, WG17 and WG18.

December 03	Bethlehem, U.S.	Task Force Power Quality
April 04	Stockholm, Sweden	WG10
April 04	Älvkarleby, Sweden	WG17 / WG18
July 04	Montreal, Canada	
November 04	Nimes, France	
April 05	Ann Arbor, U.S.	
August 05	Baden, Switzerland	Modelling Workshop
September 05	Klaus, Austria	

FDIS of part 10 was issued in February 2005. With the publication of part 10 as standard in May 2005, the first edition of IEC 61850 was completed. The first CD of Amendment 1 to IEC 61850-7-4 (Power Quality) was issued in April 2005.