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For the trade press

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Siemens commissions the world's first substation control system based on IEC 61850



→ Press picture

Six months after the IEC 61850 communication standard for substation automation was released, Siemens Power Transmission and Distribution (PTD) installed the world's first substation with IEC61850-based control. This took place in Switzerland in early November 2004. The equipment is in use in the 16 kV Winznaschachen substation, where Siemens installed the Sicam PAS control system in accordance with the new norm in the whole substation. The customer is Aare-Tessin AG (Atel), an independent energy group operating throughout Europe and headquartered in Olten, Switzerland. The new communication standard ensures the required interoperability in the substation. Really new is that all connected protection devices "speak" a common language, regardless of manufacturer, and have no problem exchanging data with one another.

There have so far been relatively few cases where substation protection systems and bay controllers originating from different manufacturers could communicate with each other. On the contrary, a substantial variety of communication protocols exist in substations across the world today. For the operator, this means a lot of work during commissioning and unnecessarily high costs, as countless protocol converters have to be used. A further problem is that different communication protocols have a negative effect on the long-term maintainability and extendibility of the equipment. IEC 61850 will be a great help in this respect.

In order to exploit the benefits of the new standard, Siemens PTD was

engaged to make the substation fit for the future by ensuring its communication capability in line with IEC 61850, besides replacing the over 40-year old switchgear at the Winznauschachen substation with a new metal-clad, compartmentalized Siemens medium-voltage switchgear system NX Plus C. A further requirement was that it should be possible to control and monitor the equipment remotely as well as locally. The protection and control functions were to be realized using combined protection/bay control devices. State-of-the-art substation control and protection was to be the heart of the substation.

The configuration and parameterization phase of the substation control was successfully completed at the beginning of November after a period of only four weeks. This was because Siemens PTD had played a major role in development of the new standard and was therefore able to implement the necessary communication technology in its substation control and protection at a very early stage. In Sicam PAS (Power Automation System), the Winznauschachen substation now has an open control system using IEC 61850 as the standard for communication between the bay and substation levels.

With its network and IT capability, the control system can also be integrated into existing equipment. To this end, communication drivers are available for all common protocols at the substation level besides the IEC drivers. There are interfaces for OPC servers and clients for integration in office applications or database systems. As a first step, Siemens adapted its Siprotec 4 protection systems to the IEC 61850 standard. This series can be deployed for substation control as protection device, bay control devices or combined protection and bay control devices. Siemens has further developed its Digsig tool for the parameterization of bay control equipment to meet the requirements of IEC 61850: equipment files can be created and substation configuration performed according to the new standard.

In the context of ongoing globalization and deregulation, it is not only industrial enterprises who are active, but increasingly power network operators too. This was the reason for specialists from around the world to come together and create IEC 61850, which is now on its way to becoming the globally accepted communication standard for substations.

The Siemens Power Transmission and Distribution Group (PTD), with its Head Office in Erlangen (Germany), is one of the leading global players in its market sector. As a product supplier, system integrator, solution designer and service provider, Siemens PTD ensures - for utilities and industry alike - the efficient and reliable transmission of electrical energy from the power plant to the consumer. With a worldwide workforce of about 19,200 and represented in more than 70 countries, in the fiscal year 2004 (year-end September 30) PTD achieved sales of EUR 3.6 billion and a Group profit of EUR 238 million. Further information at: www.siemens.com/ptd.

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