

# IEC 61850 – A unifying global communication standard



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## Dear Reader,

Substations are key components of the power grid, facilitating the efficient transmission and distribution of electricity. They play a vital role in terms of monitoring and controlling power flows and provide the interconnection between generating facilities, transmission and distribution networks and end consumers. Substation automation systems make their control and monitoring possible in real time and help maximize availability, efficiency, reliability, safety and data integration.

For decades, the power sector was geographically split between two major standards – IEC (International Electrotechnical Commission) and ANSI (American National Standards Institute). This often proved a deterrent to the development of a global technology offering.

IEC 61850 broke this deadlock. Since its publication in 2004, it has been embraced by both the IEC and ANSI communities. The new standard was designed to:

- Provide a single protocol for a complete substation
- Implement a common format to describe the substation and facilitate object modeling of data required in the substation
- Define the basic services required to transfer data using different communication protocols
- Allow for interoperability between products from different vendors

The standardization work commenced in the mid 1990s and continued for almost a decade, involving more than 60 experts from utility and technology providers across the globe. ABB was very much a part of this process and some of the contributors are represented in this report.

IEC 61850 provides a standardized framework for substation integration that specifies the communications requirements, the functional characteristics, the structure of data in devices, the naming conventions for the data, how applications interact and

control the devices, and how conformity to the standard should be tested.

Following its introduction, the implementation of IEC 61850 has advanced at a remarkable pace. Perhaps never before has an industrial standard been accepted with such speed. Within two years of its release, a majority of the market was demanding IEC 61850 as the preferred communication protocol.

It is increasingly being used for the integration of electrical equipment into distributed control systems in process industries. The fact that new application areas, such as hydro and wind power are being added is yet another indication of its success.

The bottom line is about how technology can lower costs, improve reliability and enhance efficiency. IEC 61850 has a proven track record of deliverable benefits to both small and large utilities. Communication infrastructure costs money to install, configure and maintain. But the savings that IEC 61850 delivers by way of substation design, installation, commissioning, and operation combined with new capabilities that are not practical or cost effective using legacy approaches, makes it a worthwhile investment.

This special edition of *ABB Review* looks at this truly global and unifying standard from different angles and relates many of our experiences based on the vast installed base we have built during the years. We shall also attempt to take a peek into some possible future developments in this area.

We hope you enjoy reading this dedicated special issue.

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