



The power of one system
A unified control environment that saves
time, reduces cost and manages risk

Automation and electrical integration with System 800xA.

The comprehensive solution from the industry leader that saves time, reduces cost, and manages risk.

Automation and electrical integration is the next frontier in delivering a unified environment that will drive improvements in productivity, increase safety, and reduce costs. With the growing number of complex plant system interfaces and fewer employees to maintain such systems, a need for integrating both automation and electrical aspects into one system has arisen. Traditionally different groups of people maintain these separated worlds. But now a collaborative momentum offers remarkable prospects. Different industries have different objectives. For example, the Oil and Gas industry wants to maximize production by keeping the process running. Load shedding during power interruptions is critical. Pulp and Paper, Steel, Aluminum, and Cruise Ship industries consume large quantities of energy. They need to manage electricity as a raw material cost through peak shaving and power consumption prediction.

Origins of electrical integration

Electrical Integration is not new. It originated with the Substation Automation (SA) Industry. SA industry leaders recognized the need for better and particularly faster communication between the electrical devices.

The SA Industry's solution is based on the IEC 61850 standard. IEC 61850 is an Ethernet-based global standard for communications and system architecture in Substation Automation and Power Distribution Systems. It provides a flexible and open architecture for interoperability among Intelligent Electrical Devices (IEDs), virtualized modeling of logical devices and a common IED configuration language.

Extending electrical integration to the process control industry

Driven by the success of the SA Industry the next goal became obvious: to extend the integration capabilities to the process control side. ABB has created a solution called IEC 61850 Connect that integrates the electrical side with the process side.

Figure 1: The entire picture - System structure showing the areas that are integrated

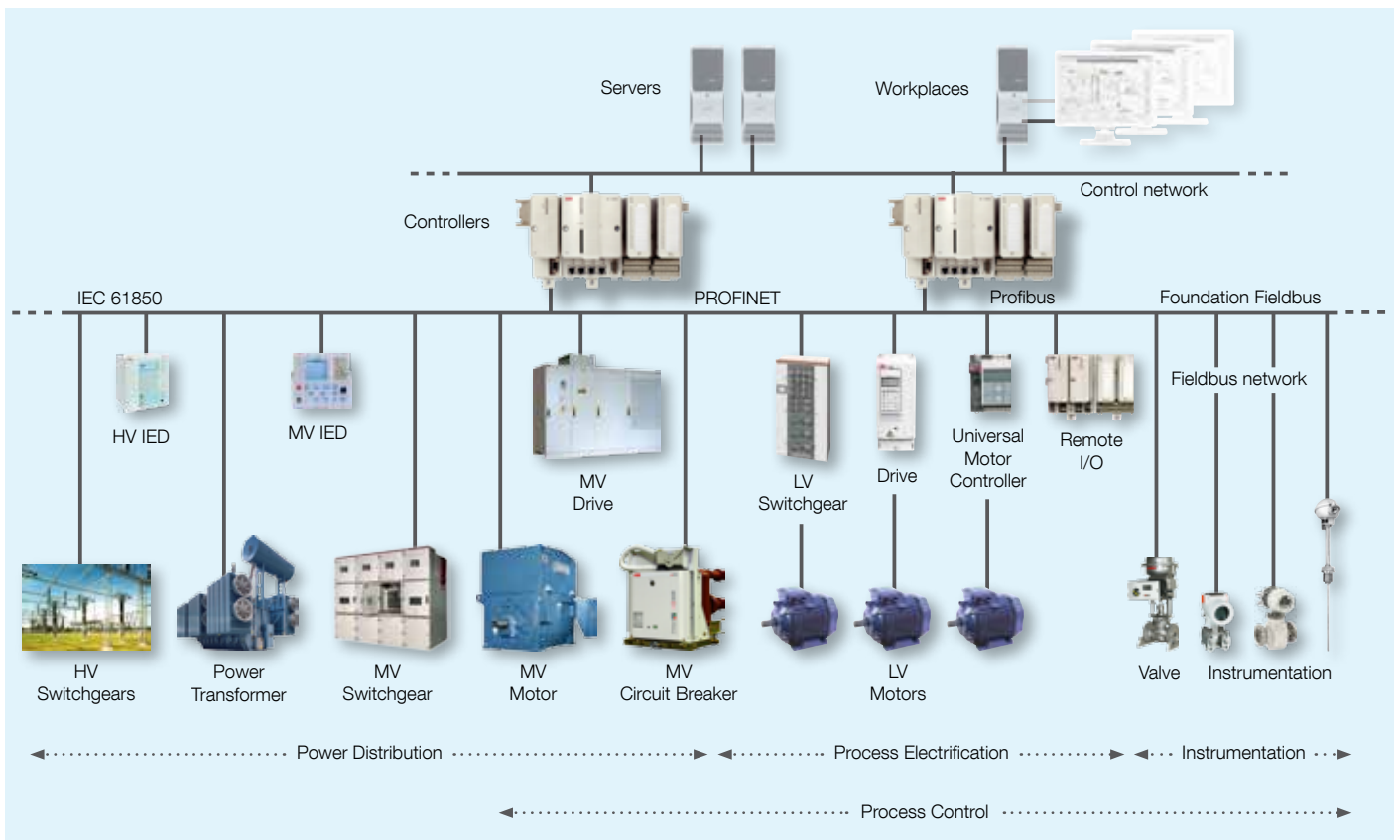


Figure 1 shows a summary of the areas to be integrated, At the rightmost you see instrumentation and process electrification for low and medium voltage devices. For field instrumentation, integration is typically achieved by using fieldbus technologies such as Profibus or Foundation Fieldbus, while process electrification is the domain of Profinet. Next to it you see at the left side the power distribution area with generators and transformers, where communication is based on IEC 61850. With 800xA IEC 61850 Connect the entire Power Management and Control, Process Electrification, and Process Control can be integrated into just one unified environment.

IEC 61850 communication works to some degree like a fieldbus, but it is reasonably faster because of the underlying Ethernet. As fast communication is a prerequisite for load shedding applications, horizontal communication is available and so the IED may respond in time-critical manner through multi-cast. For easy handling when adding new devices, maintenance issues and operator interaction, vertical communication is available - much like peer-to-peer. Together with 800xA's Power Management System, which sits on top of the IEDs, this is a perfect fit for enhanced productivity and for cost reduction at the same time.

Benefits of plant integration with ABB's IEC 61850 Connect

There are many benefits of electrical and automation integration with ABB's IEC 61850 Connect. A single view of both electrical and automation systems is provided without additional process system I/O, complex software interfaces, and marshalling racks. It also gives plant personnel greater flexibility in controlling the entire facility. Unified operations reduce duplication of equipment, make staff more effective, and lower

training costs. With a common platform, end users experience lower maintenance and life cycle costs, capital cost savings, and efficient engineering by integrated project teams. Electrical and Automation Integration with System 800xA provides a central point for ERP system access, a central data historian for critical data collection, as well as a common alarm and events list. Extended Asset Management capabilities enable both process and electrical condition-based monitoring to be done with one system.

Typical savings realized by integrating the electrical side of a plant with the process control side is 20%!

Example use case: integrated interlock of a chemical reactor and a single line diagram

In Figure 2, a Medium Voltage (MV) mixer motor has been inhibited such that it cannot be started from the process display. The operator will immediately switch to the electrical Single Line Diagram (SLD) display and check the circuit breaker status. He can also view the integrated CCTV (Closed Circuit Television) and review online design documents, all from a single operator station. With the integrated information, plant operators can make informed decisions quickly based on relevant known good data.

Summary

Extending Electrical Integration to the process control area can achieve the same advantages the Substation Automation industry is enjoying today. With System 800xA's IEC 61850 Connect, Automation and Electrical Integration combines Power Management and Control, Process Electrification, and Process Control into a unified environment thereby increasing productivity and decreasing downtime.

Figure 2. Medium Voltage Mixer Motor

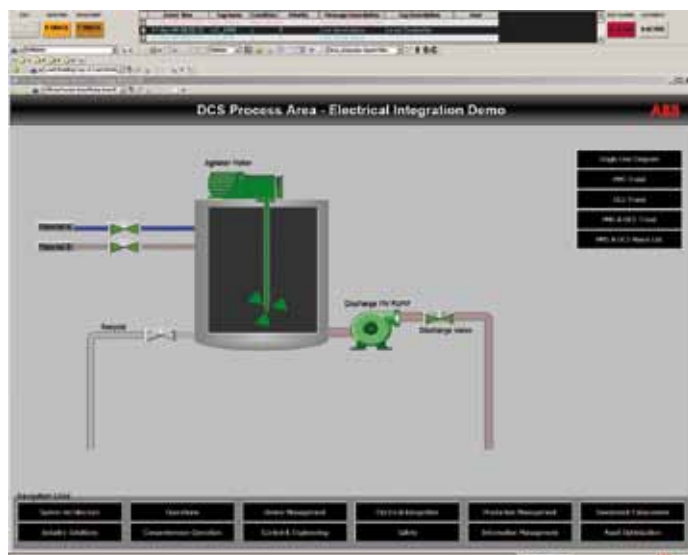
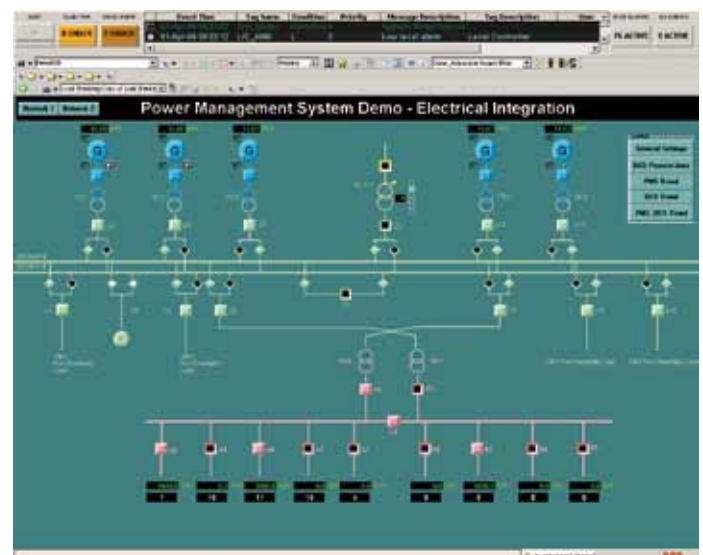


Figure 3. Single Line Diagram (SLD) display showing relay and circuit breaker statuses.



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