



Protection, Substation Automation &amp; Network Control

# ABB's first IEC 61850-based Substation Automation solution in successful operation



## Customer statements:

“We needed a supplier with proficiency and experience in the retrofit business. On top of that, expert IEC 61850 knowledge and system integration capabilities were called for along with fully interoperable systems, products and tools. ABB's reliable and efficient project management ensured on-time, interruption-free refurbishment on a feeder-by-feeder basis. The entire equipment scope is not only covered with state-of-the-art technology, but IEC 61850 interoperability was leveraged to realize a fully integrated SA system that is open and future-proof in every respect”, says Serge Läderach, head of the mandate EGL.

EGL uses ABB's IEC 61850-based solution and system integration capabilities to maximize the benefits in the retrofit of the Laufenburg 380 kV substation:

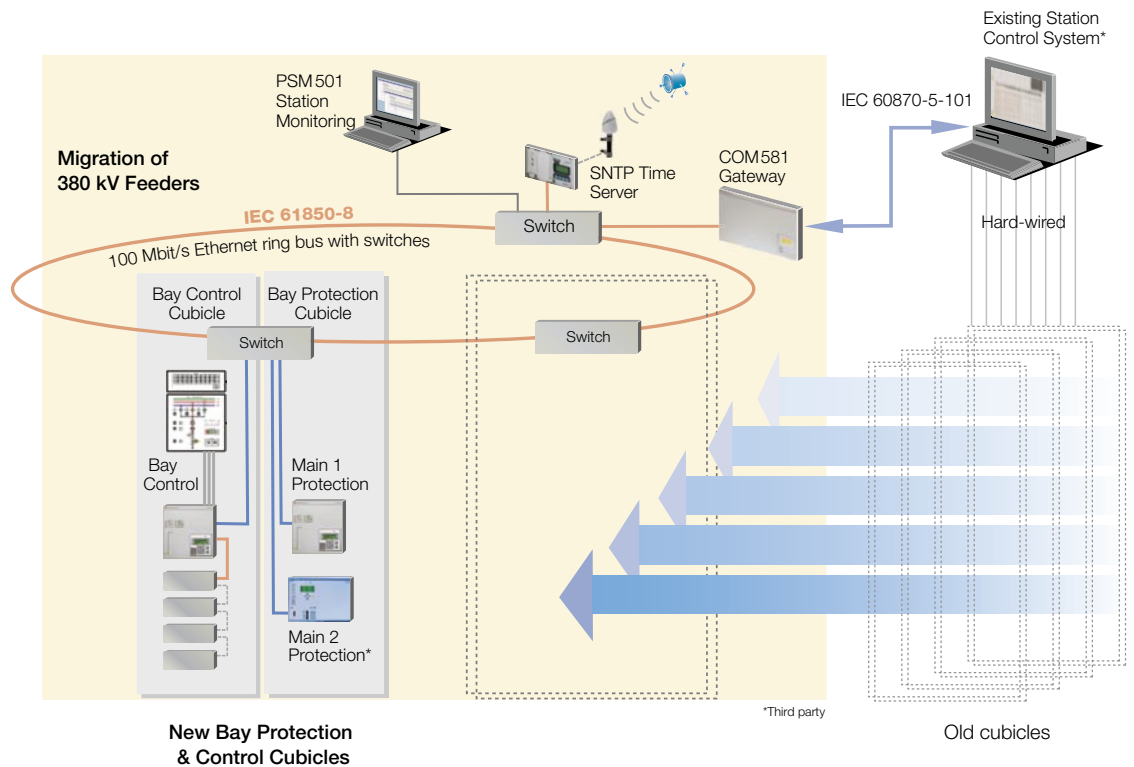
- Minimal service interruption    ■ Smooth technology transition
- Sustainable migration strategy, open for selective refurbishment
- Optimal life cycle management and low life cycle cost through future-proof system with IEC 61850 interoperability

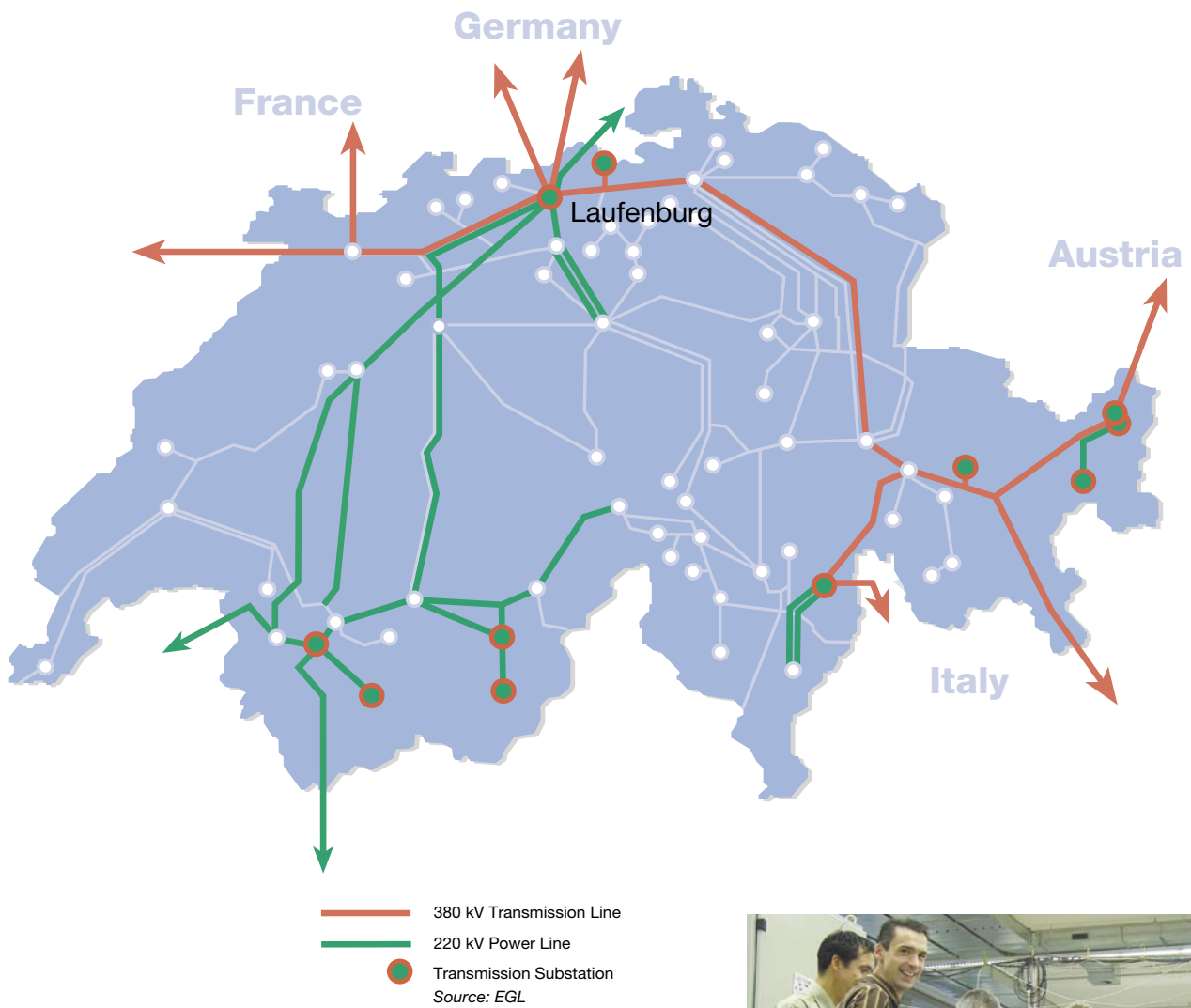
### The Customer

The Swiss utility Elektrizitäts-Gesellschaft Laufenburg AG (EGL) owns and operates an important part of the Swiss 380/220kV transmission grid. Founded in 1956 to manage electricity trading activities, EGL was a main initiator of the European interconnected grid two years later. Its Laufenburg substation is a key node in the European interconnected system. When built in 1967, the 380 kV substation was referred to as the “star of Laufenburg”, interconnecting the French, German and Swiss 380 kV grids. Its configuration is a triple busbar system with by-pass busbar and several longitudinal sections. After almost 40 years in operation, the primary and secondary equipment of seven out of 17 feeders is being replaced in several steps over a two-year period.

### The Challenge

Reliable overall refurbishment of five line bays, one transformer feeder as well as one bus coupler needs to be performed during continuous operation within a highly critical time span. A future-proof retrofit concept is required comprising new hybrid switchgear, i.e. a combination of outdoor AIS and GIS. The new secondary equipment for control and protection shall be IEC 61850-compliant, satisfy EGL’s philosophy and also interface with existing parts. A sustainable migration strategy shall ensure smooth transition to the new technology, allow selective refurbishment of components to suit operational and economic needs as well as freedom of choice in suppliers for various parts and stages of the project and future extensions.





*EGL's and ABB's teams during the successful factory acceptance test in Baden/Switzerland.*

#### **ABB's solution**

The solution and migration scenario chosen for the primary and secondary refurbishment is based on the feeder-by-feeder installation and commissioning of highly integrated gas-insulated switchgear on the primary side as well as new IEC 61850-compliant control and redundant protection equipment on the secondary side. This involved integration of a 3rd party Main 2 device as well as communication to the existing station level system via gateway for protocol conversion. The complete engineering process according to the IEC 61850 standard has been verified by the successful system integration.

### EGL's benefits at a glance

- Minimal service interruption
- Smooth technology transition
- Sustainable migration strategy, open for selective refurbishment
- Low risks
- Optimal life cycle management and low life cycle cost through future-proof system with IEC 61850 interoperability:
  - fully integrated SA system
  - reuse of engineering data for extensions, upgrades and replacements, e.g. new station HMI
  - efficient maintenance and consistent data management
  - easy integration of various parts/stages handled by various suppliers
  - safeguarded investment into future utility communication architecture beyond the substation, e.g. NCC link, power station, etc.
- Maximum safety in control and protection
- Efficient training and support

The compact hybrid solution combines gas insulated switchgear (GIS) modules with silicon bushings for connection to the existing air insulated switchgear (AIS) busbar.

- Space savings  
*One module comprises circuit breaker, disconnecter, earthing switch and instrument transformers*
- Short installation time
- Maximum operational safety
- High immunity to environmental conditions
- Simplified maintenance  
*Replacement of a complete pole within 24 hours*

**All of EGL's objectives are achieved through close cooperation with a competent supplier**



Control and protection panels before...  
...and after the retrofit



Compact hybrid switchgear solution

For more information please refer to the responsible ABB sales engineer for your country or to the address mentioned below.



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