



Protection, Substation Automation & Network Control

Energias de Portugal chooses ABB's IEC 61850 SA solutions



Customer statements:

“Lean operation and efficient maintenance are key issues in our strategy, also when it comes to substation automation. We started early to standardize system architectures, communication topologies and HW as well as functionality. Wanting to introduce IEC 61850-based systems in our distribution network, we certified a range of manufacturers. In ABB we found a very competent partner, with whom we could build on excellent experiences from dozens of successful projects. This made migration to the new standard easy for us”, says Mr. Aurélio Blanquet, Director of the Automation & Control Division at EDP Distribuição Energia, S.A.

EDP Distribuição Energia S.A. modernizes six important distribution substations with IEC 61850-compliant automation, control and protection solutions. ABB helps to maximize the benefits:

- Optimal operator support with high-quality interfaces, proven functionality and automatic sequences
- Simplified and cost-effective maintenance of standardized equipment with local and remote communication access
- Extendable, future-proof systems offering long-term stability and durability for investment protection

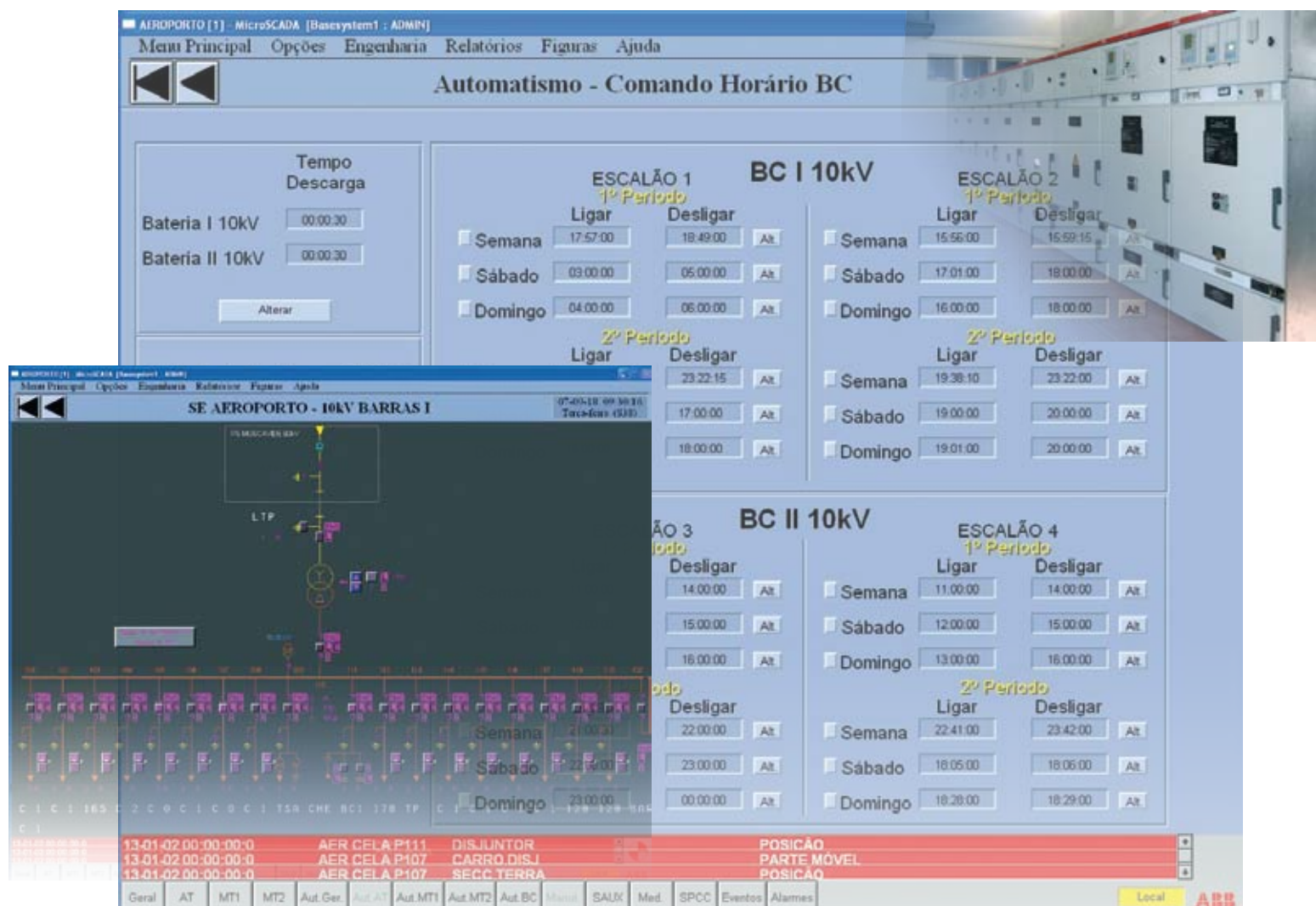
The Customer

EDP (Energias de Portugal) is an Iberian operator of energy solutions in the areas of electricity and gas. Being one of the major European players in the energy sector, it owns companies for power generation, supply and distribution. Its daughter company, EDP Distribuição Energia S.A., is the largest utility in Portugal with some 400 distribution substations controlled by two HV Dispatch Centers. Six Control Centers assure the operation of the MV network, with more than 4.000 feeders and 70.000 km of lines and cables. The company constantly invests in the further improvement of the already high service and supply quality to its over 5.9 million customers. To satisfy their growing demand for power, it adopts latest technologies in its infrastructures and embarked in utilizing IEC 61850, the global standard for communication in substations, soon after it was published.

The Challenge

IEC 61850-compliant substation automation systems shall be implemented in six HV/MV substations. The stations Cacém, Aeroporto, Glória, Serpa, Venda do Pinheiro and Parede are of high importance for the grid as they supply power to urban regions as well as the Lisbon airport. The stations shall be monitored and controlled both locally as well as remotely and maintenance access be provided for setting, diagnosis and correction purposes. The systems shall utilize the standard's features, e.g. horizontal communication via GOOSE messages for distributed functions. The system architecture and network topology shall be standardized throughout the grid.





ABB's solution

The **SAS 630** substation automation solution with verified IEC 61850-implementation provides local control via **Station HMI** as well as remote command and data access from the **NCC** via integrated gateway. The standardized high-quality operator interfaces, functions and system layouts help optimize operation and maintenance. Safe remote maintenance access to all IEDs on the LAN can be established via modem or Ethernet. All control and protection **IEDs are IEC 61850-compliant**. They exchange some 150 binary signals via **GOOSE** messages to perform vendor-specific distributed functions. Amongst others these include interlocking, circuit breaker failure protection (CBFP), decentralized voltage and frequency load shedding, automatic voltage restoration after load shedding, automatic protection setting group adjustment according to neutral as well as varimetric and hourly control of capacitor banks.

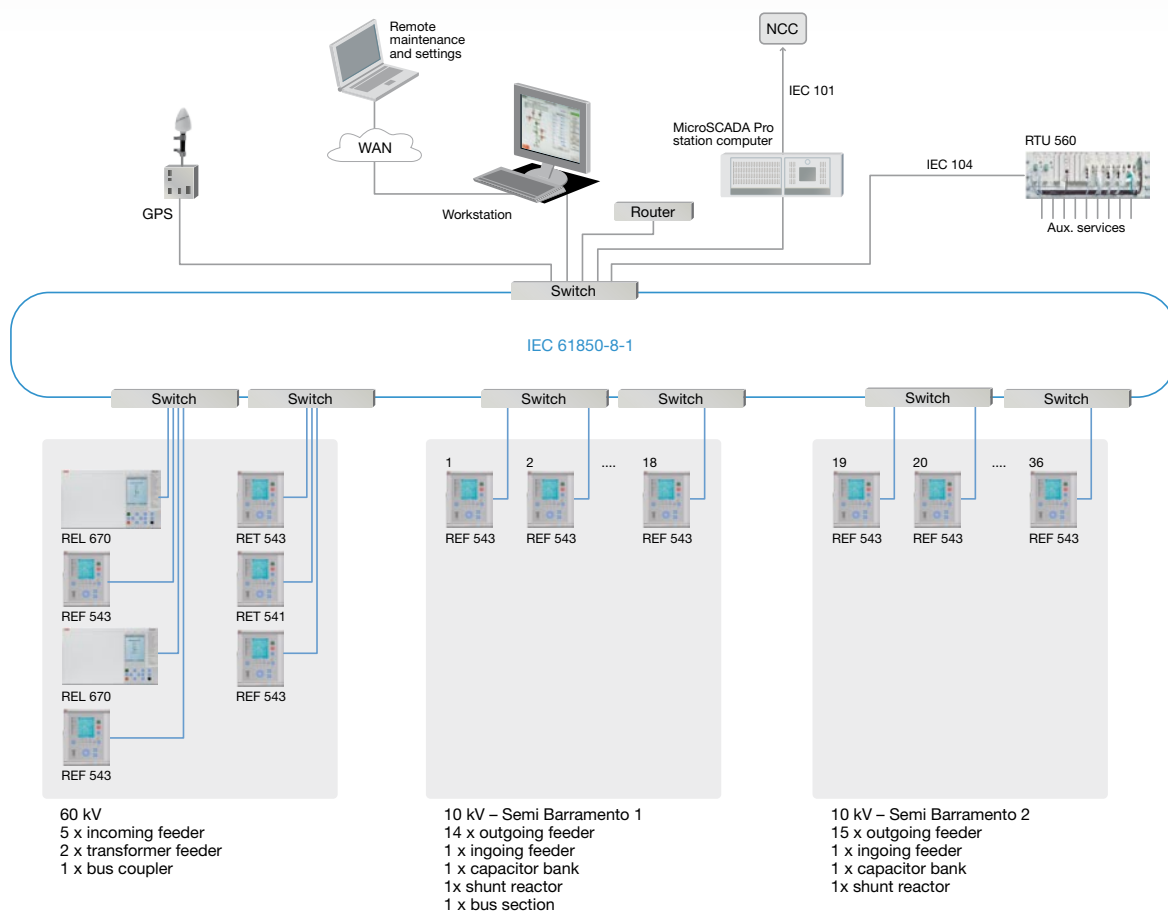
Conclusion

The migration task was excellently accomplished in close and trustful cooperation between the user's and the system integrator's teams. The transition involved comprehensive training on the new technologies and went smoothly as did the acceptance tests and final taking-over.

The standard specification defining the system and functional requirements, but not detailing IEC 61850 aspects, was very well translated into a formal description using SCL and an optimal solution created.

With the flexibility granted by IEC 61850, higher objectives could be reached at lower cost than with legacy technology and vendor-specific functions could still be used. The high performance system, communication network and IEDs offer engineers safe and fast access from local and remote points. The horizontal message exchange supports the many distributed automatic functions needed to increase operational safety whilst leading to a reduction in wiring costs. The stability and extensibility of the systems along with their standardized documentation will contribute to efficiency improvements and more sustainable investments.

EDP's SAS 630 Substation Automation System



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