



*Security through redundancy*

## 24/7: backup control system guarantees complete network monitoring

The primary corporate objective of Energie AG Oberösterreich Netz GmbH is the secured supply of electricity to its 435,000 customers. In order to guarantee this supply throughout the year, the energy supply company has deployed a backup control system - in addition to the main grid control system. The engineers at the new grid control center have trusted in the years of experience of system integrator Sprecher Automation GmbH and the modern grid control technology of COPA-DATA for this "insurance".

*The backup system runs on a total of four monitors in the grid management center in Linz: two of these are in the area of the high voltage grid control point (pictured) and two are in the area of system data administration. Display on two monitors enables more efficient monitoring: for example, an overview screen and a chronological event list can be displayed at the same time.*



Energie AG Oberösterreich Netz GmbH's grid control center controls and monitors around 10,000 km of high and medium voltage grid (110 kV, 60 kV, 30 kV and 10 kV), 63 distribution stations and substations and 8,500 transformers around the clock, 24/7. The distribution network covers an area of around 10,150 km<sup>2</sup>. Customers in 389 municipalities in Upper Austria, Salzburg, Styria and Lower Austria are supplied with power from Energie AG's distribution equipment. Services in the grid management field range from the control and monitoring of high and medium voltage networks, status estimations for the monitoring of supply quality and comprehensive fault management to the documentation of all process parameters.

Although the main system has high availability, the experts wanted to be 100% sure with a PC-based backup control system. Johannes Kaindlstorfer, the Operating Network Control Team Leader at Energie AG Oberösterreich, describes the initial situation: "We wanted to achieve 100% system availability and create redundancy for all data and data routes with an additional backup system. From the start, the objective was to set up a backup system in such a way that it could replace the main system in the monitoring direction, if required. It was also important to us that parameters could be set on the new system so it is easy to configure. As part of a tender process, the decision was made to use a control system from Sprecher Automation, which is based on the control technology of COPA-DATA, because there was already much expertise in using this software at the company and thus no costly training was required."

Andrej Medved, Manager of the Training Center at Sprecher Automation GmbH, adds: "We provided the first five process screens as part of the basic engineering of a prototype and actively involved the engineers in their configuration. The employees of Netz GmbH were able to create all other screens on their own."

## DATA SECURITY THANKS TO INDEPENDENT NETWORKS

In the new network control room in Linz, where centralized control and monitoring of all grids in the supply area takes place, a total of six medium-voltage workspaces, two high-voltage workspaces and two system maintenance workspaces ensure smooth operation and an overview down to the smallest detail. The backup system provides visualizations of the desired overview and more detailed analysis on two of its own dedicated monitors whilst on the main system at the same time – one in the high-voltage area and one in system maintenance. The backup system contains approximately 30,000 data points, with around a third displayed in screens. Each computer is equipped with a LAN interface so that both systems can only be connected to the network provided for them. The Runtime system and the Editor workspace are operated in stand-alone form by means of a hardware-independent network. Data is transferred over the LAN from the RTUs or SCADA systems from the outer stations to the backup control system directly using IEC 60870-5-104. In contrast to the main system, which takes on the roles of control



*All eight workspaces in the areas of medium-voltage (six workspaces) and high-voltage (two workspaces) are each equipped with six monitors and thus ensure an optimum overview of all data and processes. User-friendliness is also considered: all six monitors can be operated with a single mouse, which also increases working efficiency considerably.*

and regulation, the backup system serves to monitor the data and data routes and is limited to the areas of high voltage, distribution stations and substations. This monitoring is based primarily on switch settings, topological coloring, alarms and measured values. In the high-voltage area it consists of an overview screen of the 110 kV grid and a detailed screen of the 110 kV, 30 kV and 10 kV grid for each distribution station. All flows of data are monitored without fail using the chronological event list and switchgear can be manually updated if required. In addition, a hierarchical backup system is implemented, which is based on alarm classes and priority levels which can be switched on or off. During implementation, particular attention was paid to adapting the design of the screens to that of the main system, in order to increase user-friendliness and make it possible for the employees to have a simple, trusted method of operating.

### **CENTRALLY MONITORED, SUPPLIED AROUND THE CLOCK**

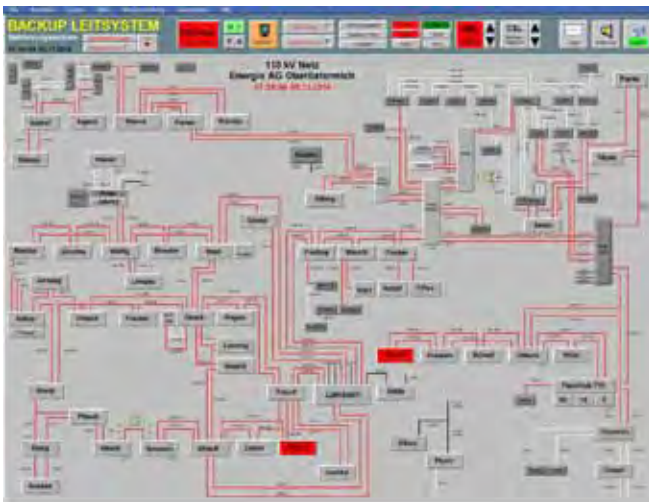
By the fall of 2010, Energie AG Oberösterreich Netz GmbH's grid management was carried out in the grid control center for high voltage operations and in five decentralized medium-voltage control centers, three of which are also responsible for the power stations. Once the complete renovation of the grid control center in Wegscheid, Linz, has been completed, all grid control centers will have successfully been converted and operated from the grid control center. Johannes Kaindlstorfer sums up: "The backup

system has met all our expectations and has already proven itself in practice. When making changes to the main system as part of the conversion, the backup system took over operations temporarily and everything ran according to plan. As a result, we now know we are equipped for an emergency and can guarantee our customers a consistent supply of energy."

### **A ONE-STOP SHOP FOR PROFESSIONAL SUPPORT: SPRECHER AUTOMATION**

Linz-based Sprecher Automation is an expert in energy equipment, process automation, energy automation, sensors and scanners. In this project it was responsible for successfully implementing and putting into operation the backup control systems. It achieved this using SPRECON V 460, a modified process control system based on the HMI/SCADA technology zenon, from COPA-DATA. The range of services that the company offers includes: consulting, planning, engineering, documentation, development, manufacturing, assembly, commissioning, training and after-sales services. Around 100 qualified employees, at a total of nine locations, work on professional project execution for municipal operations, public institutions, energy providers, industrial and transport companies. Sprecher Automation GmbH has worked together with the system supplier COPA-DATA since 2006, successfully collaborating on automation projects in the energy sector. It provides its customers with individual, tailor-made complete solutions thanks to its process expertise, gained over decades.





(Left) The overview screen of the 110 kV grid provides information on the current supply status of individual regions using topological coloring. The users are informed of deviations or faults in the system immediately by means of the integrated alarm management and can immediately instigate the required measures

(Right) distribution stations are also monitored using the backup system. The picture shows the distribution station in Gmunden (Upper Austria) and its respective load flows. There are three options to process the status of messages: manual updating, (ON/OFF), silent data processing or message blocking.

## PROJECT FUNCTIONS IMPLEMENTED

- ▶ Display of all Energie AG Oberösterreich distribution stations and substations (63)
- ▶ Display of individual screen and grid screen
- ▶ Topological coloring
- ▶ Alarm management system: three priorities per voltage levels; on/off
- ▶ Ground fault display, display of transient ground faults
- ▶ Process state logs
- ▶ Status processing of messages: silent data processing, message blocking, manual values
- ▶ Simple display of load flows
- ▶ Notes for disposition
- ▶ Option to control



Successful cooperation for constant grid monitoring – the project leaders in the modern grid management center in Linz (from left to right): Andrej Medved, Training Center Manager/Product Portfolio Manager at Sprecher Automation GmbH; Christian Mair, Telematic Services, Energie AG Oberösterreich Data GmbH; Gerhard Luckeneder, Network Data Technician, Energie AG Oberösterreich Netz GmbH; Johannes Kaindlstorfer, Grid Management Operations Team Leader, Energie AG Oberösterreich Netz GmbH and Klaus Gruber, Telematic Services Group Leader, Energie AG Oberösterreich Data GmbH.