

RETROFIT OF SECONDARY SYSTEMS OF THE 110 KV SWITCHGEAR AND INTEGRATION OF THE 20 KV SWITCHGEAR WITH PROTECTION SYSTEMS AT THE DÜRNROHR SUBSTATION



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The substation Dürnröhr is an important node within the European grid. Also this substation is in charge of power transmission for the nearby caloric power plant Dürnröhr with over 350 MW

Dürnröhr is one of the ten largest substations in Austria which covers the voltage levels of 380 kV and 220 kV of the APG (Austrian Power Grid) as well as the 110 kV and the 20 kV of EVN (country utility of Lower Austria).

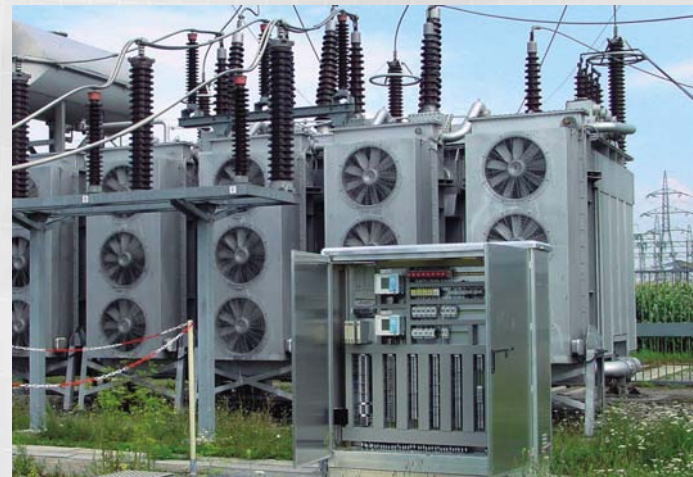
In order to guarantee a high safety and availability level in the future, the 30-years-old 110 kV switchgear, which consists of 2 transformer feeders (220/110/20 kV), 1 coupler feeder with busbar earthing switches and 8 line feeders, had to be retro-fit.

Also the levels of operation safety as well as automation have been increased.

The project was finished in autumn 2004 resulting from successful teamwork between EVN and Sprecher Automation.

Scope of delivery and services

- Project management
- Planning and documentation
- Outdoor cubicles and bay computers
- Station control systems and VDU-based workstations
- Integration of protection systems (serial und parallel)
- Serial connection to the existing remote terminal unit of the 20 kV medium voltage switchgear via ABB P214 protocol
- Partial renewal of the station auxiliaries
- Integration of metering including PQMS (Power Quality Management System)
- Complete cable exchange



Outdoor cubicle at the substation Dürnröhr

Professional retrofit - avoiding down times

Maintaining main operation during retro-fitting was a particular challenge. In order to sustain functioning of outgoing feeders that were directly affected, Sprecher Automation arranged some temporary installations for the bay-wise retrofit.

Several arrangements had already been accomplished in the station building before the actual renewal works started at the outdoor bays. Concerning the shortness of the retrofit time, the team could benefit from these arrangements at the highest possible level. Therefore enough space was provided for the new control systems and the protection cabinets.

Furthermore, the retrofit time for the bays could be minimised (one week per bay). Operation-affecting down times could be consequently anticipated.

Implementation ELCAD 7.1.2 acc. to EVN standards

In the course of the implementation, all circuit diagrams were designed in accordance with the new EVN standard ELCAD 7.1.2 for the first time.

This resulted in a significant advantage for the plant operator: facilitation of maintenance and trouble-shooting.

SPRECON-E - the Sprecher control system

Through implementation of the SPRECON-E control systems the 110 kV and the 20 kV switchgears can be now controlled centrally at a higher safety and availability level.

Implemented station and remote control systems:

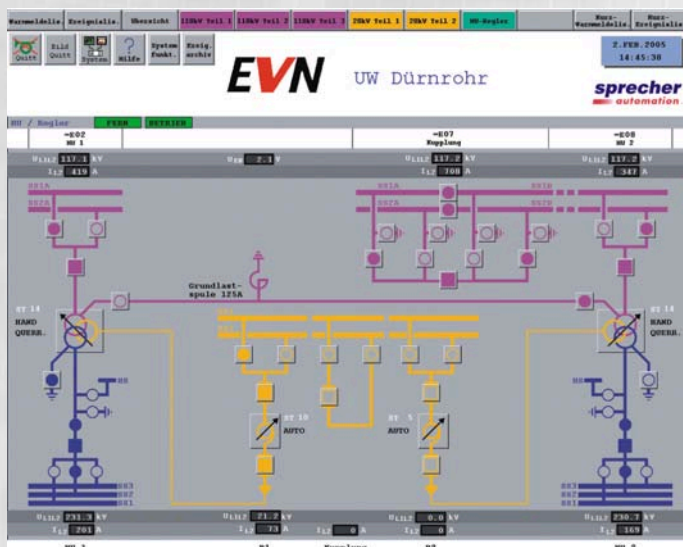
- Central control station with SPRECON-E station computer
- Local VDU-based workstation with mass storage: SPRECON-V
- Serial interconnection of the existing remote control substations of the 20 kV switchgear via ABB P214 protocol
- Serial remote control connection to APG control systems based on the protocol SAT 1703 PCMBAA-EE

- Serial remote control connection to EVN control center (system operator) based on protocol SAT 1703 PCMBAAEE, prepared for IEC 60870-5-104
- Connection of all SPRECON-E bay computers to the station computer (fibre-optic)
- Fibre-optic connection of all protection devices to the SPRECON-E station computer via integrated star coupler
- Central alarm logging via SPRECON-E station computer

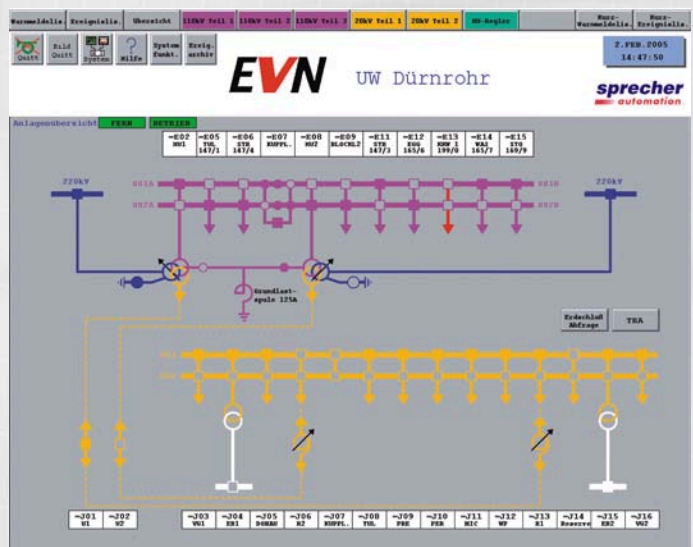
Operation and monitoring

The substation can be operated and monitored in the following ways:

- Via remote control: EVN control center (system operator)
- At station level via SPRECON-V (VDU-based workstation)
- Local control via the control panels of the SPRECON-E bay computers with full-graphical LC displays (bay control level)



Detailed visualisation of main transformer



Overview visualisation of the substation

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