

EnBW ZNL Esslingen [Germany]



State-of-the-art technology controls the most reliable power supply

With some five million customers, EnBW Energie Baden-Württemberg AG with its headquarters in Karlsruhe is the third largest energy company in Germany. Their core activities focus on the segments electricity, gas as well as energy and environmental services.

With the central control room (ZNL) in Esslingen, the EnBW Regional AG technology center meets the requirements for a safe and efficient network management of the medium voltage power distribution. Twenty highly qualified operators ensure smooth power distribution functions at any time - in Stuttgart, in the central Neckar area and up to the northern Black Forest. With the latest technology, approximately 15,000 transformer substations, 200 substations and 10,000 kilometers of medium voltage overhead power lines and cable are controlled. This project has been realized with the software of PSI AG.

One of the most important tasks of the control center is the continuous monitoring of the networks and their control. This process is carried out by two procedures. The strategy is to "control centrally - act locally", therefore the 4,000 square kilometers area is controlled from the central control room ZNL, while field crews carry out the work.

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The ZNL Esslingen is equipped with 4 display walls each consisting of 4x2 OVERVIEW mDG50-DL projection modules and a TRANSFORM A controller



Network control and monitoring - around the clock

The ZNL monitors and controls the current power flow as well as the voltage in the distribution network. Overloads and limit violations are immediately corrected by appropriate measures, such as reconfiguring the network. Network calculations, simulations and interlocking functions enable the operators to control the network. All operators working in the ZNL have many years of experience, and undergo regular training to keep their knowledge up to date.



With ZNL Esslingen, we meet the requirements for a safe & efficient network management. “

Immediate troubleshooting & disturbance recovery

The network control center is like a spider's web – all information is gathered there. If the power fails at any location, fast fault detection, isolation and service restoration is essential. Today's technology helps to visualize the sometimes complex scenarios. The error location, which has been identified by the control system, is clearly visualized. The defective equipment is isolated from the healthy network either by remote control or by field crews working under instruction of the control center.

Tandem workplaces

The distribution management center consists of four control rooms. Each one is responsible for a part of the 10-, 20- and 30-kV medium voltage network. The four control rooms share a single control system, therefore any location can be controlled out of any control room. The operators are using so called "Tandem workplaces". Depending on the situation the operators can work individually or support each other. Each Tandem workplace is equipped with a Barco 4x2 OVERVIEW mDG50-DL rear projection system. The entire grid can be represented using either a schematic or a geospatial display that includes the map information.

All important data is displayed: the locations of the transformer stations and substations as well as the power lines.

Visualization of entire grid area

The video wall is connected to and shared by two operator workplaces, allowing simultaneous access of the video wall and maximum return on investment. The overview of the network, together with the functionality of the control system supports the users in exceptional situations, such as when there is a fault. The integration of a video wall into 24/7 operations requires high availability. The dual lamp system, which is installed in the display walls of the distribution management system provides redundancy at the weakest spot – the lamps. Therefore, a lamp failure will not result in any loss of image.



High performance and future proof security concept

The technically innovative network management of the ZNL includes an elaborate security design. A distributed multiprocessor system provides the necessary redundancy.

This system is set up at two locations. In case of a loss at the Esslingen control room, the operations can be taken over by the second location at any time. The security concept includes also the communication between the ZNL and the substations.

Redundant network connections using independent routes are provided at this level.

Today's technical capabilities allow five older network control centers to be merged into the ZNL, ensuring maximum efficiency. The benefits are the increased availability of the power supply to the customers and reduced costs.

The other four distribution control centers of EnBW Regional AG in Baden-Wuerttemberg – Oehringen, Wiesloch, Tuttlingen and Ravensburg – will collect the information in databases and relay the data to the ZNL. Looking to the future, a structural reform is planned. The 110-Kilovolt high voltage network is presently controlled from Esslingen, Daxlanden with Karlsruhe and Engstlatt with Balingen, and may be merged into the control center in Esslingen.

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