

Case story | VACON® AC Drive

## More than **100 VACON® AC drives** control the Belgrade district heating network

With a total nominal production capacity of 2,832 MWth, the Belgrade district heating network, operated by Beogradske elektrane, the Belgrade Public Utility Company, is one of the largest in Europe. Since 2007, Metronik\* has successfully completed several retrofitting projects at the pumping stations on the district heating network. More than 100 VACON® AC drives with a total power of 30 MW currently control the hot water distribution.

As the operator of 15 heating plants with a total nominal production capacity of 2,832 MWth, Beogradske elektrane is one of Europe's largest producers and distributors of thermal energy, supplying heat to more than 300,000 households across Belgrade,

the capital of Serbia. The distribution network consists of more than 600 km of hot water pipes.

In 2006, Beogradske elektrane decided to start to modernize the distribution system, with a special focus on the pumping stations. The goal was to replace the old medium voltage, manually-operated control system with a modern solution based on AC drive technology in a low voltage network. Metronik was chosen as the general contractor and engineering company to design a customized solution that would meet the needs of the Belgrade heating plant.

Metronik chose its long-term partner Vacon AT, Vacon's subsidiary based in Leobersdorf, Austria, to supply the

AC drives to control the circulation pumps used for the hot water distribution. Metronik has installed and commissioned more than 100 VACON® AC drives in the power range from 37 kW to 1.1 MW. These include twelve VACON® NXC drives with a power of 750 kW and five with a power of 1.1 MW. The VACON® NXC drives are run independently in a multi-pump application driving several pumps in parallel, controlled by the pressure in the system.

At the same time, an automation system is being installed at the district heating plants – plant by plant. To meet customer requirements, Vacon and Metronik developed software for redundant communication, based on the Profibus fieldbus. Dusan Ilic,





*A district heating plant operated by Beogradske elektrane, which has one of the largest district heating systems in Europe. The use of VACON® AC drives on circulation and recirculation pumps for the hot water distribution across the network has resulted in significant energy savings.*

The enclosed VACON® NXC AC drive solution is compact and well tested. It is perfect for when a flexible, robust and serviceable industrial AC drive is needed, and comes in the power range of 110 kW to 2 MW. VACON® NXC drives have reliable thermal handling for the enclosure, extending the lifetime of the frequency converter and ensuring tough environments do not overly affect application processes. The control compartment is easily accessible and includes Vacon's removable keypad, and the enclosures come with lifting lugs to aid installation.

This case story was originally released before the merger of Vacon and Danfoss Power Electronics was fully completed on 15 May 2015. As a result, Vacon as a company brand no longer exists and contact persons mentioned in the story may have changed. Future case stories on VACON® products will be released on behalf of the new organization – Danfoss Drives – which is part of the Danfoss Group.



*Photos courtesy of Beogradske elektrane.*

Managing Director of Metronik in Serbia explains: "Once the automation system at a plant has been installed, we change the software and parameters in the VACON® NXC drive and it starts to communicate redundantly with the upper-level automation system."

### Significant energy savings

The VACON® AC drives control the hot water recirculation pumps across the distribution network in accordance with actual needs, and this has resulted in significant energy savings and lower operating costs. The VACON® AC drives also improve operational reliability, reduce the strain on equipment and double the operating life of the pump.

In district heating networks, the operational stability of pumping stations is a key issue. "When needed, we support the Belgrade district heating plant by providing service, spare units and regular maintenance of the drives in accordance with Vacon's instructions," adds Mr Ilic. Reliable operation without unplanned service shut-downs also brings cost savings.

**"The VACON® AC drives are excellent. We highly appreciate the technical excellence and friendly, helpful support locally in Belgrade, which is available promptly whenever needed. That is what distinguishes Vacon from the competition."**

*Slobodan Džunić, Maintenance Director, Beogradske elektrane.*

### Positive experiences

Beogradske elektrane is satisfied with Metronik's performance in project execution and maintenance, as well as with the benefits from the VACON® AC drives in terms of savings and improved process reliability.

### In detail

Metronik provides a complete range of automation solutions for industry, energy systems and infrastructure and produces IT systems for better production management. Founded in 1990, Metronik is headquartered in Ljubljana, Slovenia, and employs 70 persons.