

Boiler replacement during the heating period

Modernisation The Neustadt public utility company is betting on a new boiler. Even the automation technology was converted

Neustadt an der Weinstraße – courageous: the public utility company in Neustadt an der Weinstraße have had their southern cogeneration plant modernised in the midst of ongoing operation during the heating period. This involved the complete replacement of a boiler and the installation of a power supply and automation concept adapted to the public utility company's requirements.

“Conversions from old to new have to be well planned and implemented; several trades often have to simultaneously make or alter connections on the equipment,” explains Karl-Ludwig Fränze, department manager at the public utility company. Their customers' heat supply was the top priority. The work was performed during normal working hours between 07:00 and 16:30 where possible. Large mobile cranes and heavy equipment for the boilers were also used to cope with the several tons of weight.

What was converted | In detail, boiler I at 1750 kWth has been retained and boiler II at 1500 kWth was disconnected both electrically and mechanically – including all associated wiring. A new boiler and control cabinet were installed, whereby the new automated boiler has around 600 kW less output than the old one. Yet this is better adapted to the needs of the local heating network and is more efficient, Fränze says. Because the new boiler's control behaviour permits its combustion capacity of between 250 and 900 kW of heat output to be used according to demand.

The existing control cabinet was also tidied up: the general supply for the heating plant and the control and regulation functions of boiler I have been separated, so that boiler II now has its own switchgear that includes all boiler functions. This decentralised structure enables the boilers to be operated independently of each other. A plant shutdown, for example due to voltage isolations or failure of boiler components, is now excluded. A real advantage for maintenance and repair work.

New automation technology | The project was realised by IAE Engineering, who have been working with the Neustadt public utility company for over 20 years. During this time, both partners

have modernised five cogeneration plants of different sizes. The new automation technology also comes from LAE. It enables remote access via laptop or PC for improved monitoring and faster fault indication and fault elimination at the plant.

“This means that more and faster data relating to measured and correcting variables is sent to the higher-level controller for processing,” says Fränze. This involves electronic measurement and control technology being used to measure physical quantities. These values are then used to send control and regulation commands to heat generation units, heating water pumps and actuators to switch them on or off. Visualisation of the plant was implemented on site by means of an HMI (human-machine interface) operating panel. This enables plant behaviour to be monitored and automatic or manual countermeasures to be taken as necessary.

New higher-level PLC | The technology for the newly installed higher-level programmable logic controller (PLC) comes from Siemens. The former data connection to the control centre had previously only used hardware to transmit a few binary and analogue process values. The new solution provides connectivity via the IEC 60870-5-104 telecontrol protocol. LAE Engineering believes that the now consistent data management permits a uniform archive and operating concept. This will make it “particularly easy” to use overarching functions. Efficient fault analysis and faster fault localisation will also significantly reduce start-up and shutdown durations. The emergency stop safety chain has also been rebuilt: each boiler now has its own safety chain, which is overlaid by a higher-level emergency stop safety chain.

Punctual conversion | The conversion, including the new higher-level programmable logic controller, emergency stop safety chain and documentation, was handed over within the one week period despite the challenging overall conditions, praised department manager Fränze. Positive cooperation between the two companies was particularly noticeable in the area of time-critical installation and commissioning.