

Fast and Exemplary

The rehabilitation of the flood-damaged Mittersill hospital with Belimo- und Saia Burgess-Technologie

As part of the rehabilitation of the flood-damaged Mittersill (Austria) hospital, the HVAC and MCR systems also had to be renovated. The deployment of new and innovative solutions from Belimo and Saia Burgess allowed several problems to be solved at the same time.



Evacuate!

Intensive and widespread rainfall in the Oberpinzgau region of Salzburg / Austria causes the rivers to rise rapidly. All the indications point to an impending flood. At 6:33 on July 12, 2005 the power supply to the Mittersill hospital had to be switched off at the transformer. At 7:55 a red alert was issued: for the first time ever in Austria a hospital has to be evacuated - around 70 people are affected. Mittersill in particular takes the full force of the flood - with the river Salzach flowing at a rate of some 320 m³/sec, this event ranks as one of the worst floods ever.

13.7. 2005: The day after - the damage to the hospital is surveyed. 175 staff temporarily lose their jobs due to the disaster, some being sent on leave, as all technical systems needed to operate the hospital are damaged. But the waters have reached their peak and, as they recede inch-by-inch, confidence returns and workers regain their spirits and set to work with a will.

The cleanup begins

The hospital receives prompt support from external experts such as TB Stampfer. Among the first specialists to get involved in the assessment of the damage is the firm of Bergmann Leopold, experts in control engineering and building automation. The task of clearing up the damage begins as early as the 14th July. A target date of early September 2005 is set for returning the hospital to full operation. This was a bold plan since a large part of the building management infrastructure was completely unusable. Due to the hygiene requirements - too much in the way of faeces and oil had streamed into the plant with the flood water - the ventilation system had to be completely replaced. The heating system was completely rebuilt:

The original system with in-house heat production using heat pumps, a combined heat and power plant with flow heaters and block-type storage was converted to a district heating system and connected to the new district heating network. Technische Büro Stampfer was responsible for planning and supervising the manufacture of the heating, ventilation and sanitation system with the renovation of the entire hydraulic system and the redesign of the hot water supply posing a particular challenge.

Building automation/MCR/System integration

Due to Bergmann's many years of in-house experience gained through its maintenance, testing and adaptation activities, it was possible to dispense with the startup phases and get started immediately with the rehabilitation. With the main components of the existing MCR system out of commission it was decided in consultation with the hospital operator to install a completely new MCR system which would have to meet the following parameters:

- an open system, including all the engineering tools
- simple to operate and open technical support
- modular structure for future expansion
- immediate availability
- remote alarms
- network-capable (Intranet und Internet)
- remote operation for servicing and recovery
- compact – since conversion will be required in a number of hospital power distribution units
- capable of being linked to various existing sensors such as Pt100, Pt1000 and Ni1000
- integratable field buses such as LON, Belimo MP-Bus, M-BUS and EIB
- wireless LAN-capable
- operator-friendly with extensive management and logging facilities

Following an in-depth examination of the facts the decision was taken to go with the PCD3 and ViSi-Plus systems from Saia Burgess. In addition, approx. 30 e-energy meters and heat meters were linked to the Echelon LonMaker via a LON bus. For the measurement tasks, the sensors and transducers produced in Austria by EAP-electric GmbH were used.



PCD3: High performance in the smallest space

In the Mittersill hospital, nine sub-control centres were implemented with the PCD3 product range as well as the ViSi-Plus system from Saia Burgess. The staff quarters situated 0.5 kilometres away were linked in via a wireless LAN. The Saia ViSi-Plus building management system adapts flexibly to the requirements of each building management system as regards functional scope (and price). While the smallest package, "Light", is already capable of handling 250 information points, the next step up, "Medium" can handle 1,000 and the "Large" package can comfortably handle more than 10,000 information points. The user has powerful software modules available in all three packages. And with the PCD3 controllers powerful, high-

performance multi-function devices can be deployed with which up to 1,023 central I/Os can be implemented. The advantage: the device is compatible with existing PCD controllers but is at the same time open to future generations of controllers. The PCD3's comprehensive range of interfaces also ensures this: on a basic device you get the combination of USB, Ethernet, RS485, Profibus or CAN and RS232. In addition to the buses typical of a building management environment, such as EIB or MP Bus, native BACNet is also supported. For integration into a PC environment, the web browser and the professional Microsoft Net driver software from Saia Burgess can also be used.



Time and cost advantages with the Belimo control valve

Belimo products were used for all the MCR control devices and valves. Particular advantage was derived from the deployment of approximately 30 pressure-independent characterised control valves from Belimo, installed in the DN 15-50 size range. This product significantly simplified the valve layout: the flow rate is constant even when the valve closes and the differential pressure increases. In short: hydraulic balancing is no longer required. This is a huge advantage in systems that have to be rehabilitated where it is not always possible hydraulically to gather all the data from the control circuits. By doing away with the balancing valves, which become superfluous, a saving in time and cost can be achieved. Using the pressure-independent characterised control valve from Belimo, optimal tuning of the system becomes child's play and can be achieved in the shortest possible time.

In addition, the pressure-independent characterised control valves also help to avoid creeping circulation losses, saving expensive energy. Problems and subsequent claims are avoided by employing this product in a preventative role. The practice in the Mittersill hospital indicates that with the pressure-independent characterised control valve's excellent flow curve and the fast calculation cycle time of the Saia PCD3, no performance penalties are registered.

Before and After

To provide more and better protection against any future flooding, a number of defensive measures were taken during the rehabilitation of the hospital. For example: ● a defensive wall approximately 80 cm high on the east side ● pump outlets and lifting stations are no longer supplied from the distribution boards in the basement but from distribution boards situated higher up ● the emergency power unit and the low-voltage equipment were moved up to the ground floor (and a treatment room adapted for the purpose). This meant of course that all the hydraulic

connections, such as the pipe work for fire extinguishers, waste water, heating and water had to be relocated.

- windows in the basement were made floodwater-proof
- all openings in the walls were fitted or re-fitted with new seals

5.9. 2005: Operation is resumed

It is due to the tireless commitment of the firms and all individuals involved that, on the 25th September 2005, just 54 days after the evacuation, the hospital could re-open for business. According to the WHO, this is a unique occurrence in the history of health care since records began.