State-of-the-art brewhouse technology

For more than twenty years, the Huppmann brewhouse – which had been installed in the brewery in 1983 – has contributed significantly to the excellent quality of the Andechs Monastery beers. The major parts of the brewhouse equipment were upgraded to the state of the art by Huppmann and the process control system was updated by ProLeiT. „The aim of this measure is to maintain and further increase the quality level of the Andechs Monastery beers and to exploit energy saving potentials“, says Alexander Reiss, operations manager at the Andechs Monastery Brewery.

The brewery with an annual output of 117,000 hectolitres is the cornerstone of the enterprises of the Benedictine Abbey St. Bonifaz in Munich and Andechs. With their profits, the enterprises finance pastoral, cultural and social projects of the abbey, because the Benedictines do not receive a direct allocation of funds from church tax. Today, the Andechs Monastery Brewery produces seven different types of beer. The entire brewing process is marked by the connection of Benedictine-Bavarian brewing tradition and advanced brewing technology. The very traditional working method is characterized by decoction mashing, the two-tank method for fermentation and storage and long storage times of up to six weeks.

Process control system and plant engineering work hand in hand

A modern brewing process requires optimum conditions on both sides: on the automation side as well as on the plant engineering side. In the last years, a lot has happened in the field of process automation. Today, all pumps and agitators are frequency-controlled. In particular, critical processes like mashing-in, mash transfer and mash agitation can be realized very gently with minimum oxygen uptake. Shear forces are avoided to a large extent. In the lautering process, modern control systems allow higher yields, variations in raw material quality are compensated. Intelligent energy cycles with optimized temperature levels require comprehensive systems with central data management and are indispensable today, especially in the brewhouse. Modern recipe and reporting systems ensure production safety and top quality.

Upgrade of all brewhouse sections

In terms of plant engineering, all sections were upgraded with the Huppmann innovations of the last years. The MILLSTAR™ now has the patented automatic quality system, which automatically balances variations in raw material quality. A level probe in the mash hopper ensures the prevention of air intake. The lauter tun was upgraded to the Lauterstar technology. For this purpose, the wort run-off system and the raking machine were modified. The raking machine is equipped with the Huppmann double-shoe knives which allow intensive treatment of the spent grains. After the installation of an energy storage tank, the energy from the vapours can be used more efficiently in the wort boiling process.

The vapours are now primarily used for direct wort heating to just under boiling temperature. At the same time, the wort is very gently heated up to boiling temperature. The Whirlpool/wort kettle is operated with a Jetstar today. The new internal boiler concept with wort circulation below the wort surface improves the homogeneity of wort treatment and provides optimal values in evaporation and substance conversion.

Short upgrade period

The modernization of the hardware of the complete brewhouse including the transition to the brewmaxx process control system involved a shutdown of production for only two weeks. Already during the extension of the fermentation and storage cellar of the Andechs Monastery Brewery carried out by Kieselmann, the planning for the complete replacement of the process control system for brewhouse, fermentation and storage cellar, yeast cellar, CIP plant and water treatment plant had been underway. Weeks before the brew rest, the installation of the energy storage tank and the related piping had already commenced. Also part of the cabling and some new control cabinets could already been installed at that time in order to keep the shutdown period as short as possible.

INFO

Company: Klosterbrauerei Andechs
Sector: Breweries
Location: Andechs
Country: Germany

After the modernization, components like process water tanks and the CIP cycle for pipe cleaning were restarted first to ensure operation in the filling section. Then, the CIP cycles for all cylindro-conical fermenters, cylindro-conical storage tanks, yeast management and brewhouse followed. After commissioning of the CIP cycles, the first milling trials started, followed by the first water brew. After that, the first hop brew removed the last residues of cleaning media. Finally, the first brew of „Andechser Vollbier Hell“ was produced. It took not even 3 days from the first milling trial to the first brew of „Andechser Vollbier Hell“.

Process Control System and Automation in Detail

The existing Braumat system has been replaced by the brewmaxx database-supported process control system designed by ProLeiT and consisting of two workstations, one engineering station and the central server. Instead of the former S5 controller, the new system is based on an S7-416

application profile

CPU with distributed PROFIBUS I/Os (ET200 M) and interfacing to the PC level via Industrial Ethernet.

The retrofit of the control technology included the following plant sections: Malt transport, brewhouse, yeast storage cellar, waterhouse equipped with an energy storage tank, CIP plant with 2 circuits for brewhouse vessels and cellar pipes and also yeast tanks, flotation tanks and cylindroconical tanks (CCTs). The separate S7-300 controller in the yeast cellar, operated via touchpanel, has been removed, and operation is now also integrated into the central control system. Furthermore, the brewmaxx Event Messenger now allows the transmission of alarm messages via text messages (SMS) to the brewery's on-call personnel. The new process control system is connected to the local network of the brewery via a Firewall and thus allows the provision of remote maintenance and technical support directly from the ProLeiT central office via Internet (VPN connection). Last but not least, ProLeiT performs the CAD electrical design and documentation in EPLAN.