

MEASUREMENT INSTRUMENTS AT A BIOLOGICAL WATER TREATMENT PLANT

By ABB



Flows at the filter presses are controlled by ABB flowmeters. ABB pressure sensors measure pressure in and out of filter presses, which reduced volume of water to be treated by half.

Introduction

ABB instrumentation was an obvious choice when the Swedish pulp producer Vallviks Bruk AB built a new plant for biological water treatment.

Vallviks Bruk AB, located about 200 km (125 miles) north of Stockholm, produces softwood kraft pulp and chemical pulp for export. A tour of the mill shows that the relationship with ABB is firmly rooted. It contains many types of ABB Measurement products, originating from known quality manufacturers linked to ABB, Fischer & Porter, Hartmann & Braun and Alfa Laval, to name a few. www.abb.com

“There are an incredible number of flows in this kind of plant and we have almost always bought instrumentation from ABB. Only the best will

do,” says Ronny Svensson, supervisor for the instrumentation workshop where about ten people maintain the mill instrumentation.

The mill foreman for the instrumentation repair shop at Vallviks Bruk AB, Ronny Svensson, says that the water inflow to the biological treatment is about 450 cubic meters per hour (~2000 gpm). Oxygen and a type of plastic tokens are added into the tanks, facilitating the bacteria to multiply.

Increased Environmental Requirements

The pulping process consumes plenty of water. Previously the water was purified in the mill’s mechanical treatment plant. This is a large, open rotation basin where the sludge is separated from the water. www.abb.com/measurement

Some years ago, increased environmental requirements led to a major investment in a biological treatment plant. It was completed and commissioned in November 2011. Biological treatment means that the process water is

Fast Facts

- » Project: Vallviks Bruk AB’s Biological Water Treatment Plant
- » Country: Sweden
- » Requirements: Instrumentation for Flow, Pressure, Temperature, Level and Analysis.

purified by means of micro-organisms. Not only can the organic substances be removed by bio-degradation, but also inorganic salts of nitrogen and phosphorus can be degraded.

“The dirtiest water goes into the biological treatment plant. The mechanical treatment plant is still used for water needing little treatment,” explains Svensson.

Plastic Tokens Carry Bacteria

The production of chemical pulp requires a high temperature for the pressure cooker to release the wood fibers and for bleaching and washing the fiber. The warm so-called ‘back water’ comes to the biological treatment plant via two large tanks, each with a volume of 1,355 cubic meters (48,000 cubic feet). As the water temperature drops from 60–70°C to 37°C (140–158°F to 99.5°F), the ideal temperature level for biological treatment, oxygen is added while stirring the tanks to keep the bacteria alive. Also added are lots of so-called carriers, namely small plastic tokens, to which the bacteria can cling to aid their proliferation.

The next step is the coagulation basin where nutrients and iron sulfate are pumped in to really start up the degradation process. Also polymers are added to help separate the sludge by flocculation. After that the water enters the rotating basin where the sludge is separated mechanically. Finally the water is squeezed out of the sludge and the remaining waste product looks like horse manure. It is used as an ingredient in particular topsoil or pellets.

Vallviks Bruk AB produces approximately six containers a week of the waste sludge.

New Filter Presses

In the various stages flowmeters keep track of

levels and additives in the process. “We are still optimizing the installation performance in terms of additives, but the instruments have functioned as they should,” says Svensson.

The extensive water consumption at the plant would actually require a much greater biological purification process than Vallviks Bruk AB has invested in so far. The reason that the biological treatment suffices is the installation of two new filter presses, supplied by Metso Finland. The filter presses dewater the pulp much more efficiently.

The flows at the new filter presses are controlled by ABB flowmeters. ABB pressure sensors measure the pressure in and out of the filter presses, which reduce the volume of water to be treated by half.

“Without the filters it would have been impossible to create cost-efficient bio-treatment,” says Svensson.

Facts

Vallviks Bruk AB

It is one of two mills in the Swedish Rottneros Group. The mill has about 160 employees and a production capacity of approximately 240,000 tons per year. Products produced at Vallviks

Bruk AB are bleached kraft pulp ECF (Elemental Chlorine Free) and UKP (Unbleached Kraft Pulp).

ABB

It has supplied instrumentation for flow, pressure, temperature, level and analysis. Included are 55 electromagnetic flowmeters in different dimensions, approximately 20 pressure sensors in the 260 series, 12 temperature sensors with transmitters and an FSM 4000 electromagnetic flowmeter, AC.

About the Contributor

ABB provides comprehensive support – from planning and commissioning, through to complete life-cycle services for all of its measurement solutions, including: flow, pressure, temperature, level, thickness, flatness and tension measurement, valve automation, liquid and gas analyzers. ABB aims at making instrumentation and analyzer technology, selection, purchasing, installation, operation, and ownership easy – so one can focus on its business.

To know more about the contributor of this case study, you can write to us. Your feedback is welcome and should be sent at: mayur@eawater.com. Selected responses will get a 1-year complimentary subscription of EverythingAboutWater Magazine.

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– Ronny Svensson
Supervisor, Instrumentation Workshop

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