

ABB industrial drive provides cost effective 'sensorless' flow meter for process industry



Measuring the flow of cleaned water after biological treatment

M-real Sverige AB, Husum-Wifsta Factories, which is located on the eastern coast of Sweden, produces high quality fine paper and market pulp. Its annual production capacity totals 830,000 tonnes of paper (of which 250,000 tonnes coated) and 700,000 tonnes of bleached kraft pulp (of which 380,000 tonnes for internal use).

In 2004 construction of a new biological wastewater treatment plant was completed at the mill. This plant can treat up to 100,000 m³ of wastewater per day, with fibre sludge being pumped back to the mill for energy production. A flow meter is installed after the pump in the return pipeline to enable mill personnel to check that the treatment process and return pump are operating correctly, and confirm that treated sludge is being fed back to the mill.

Flow meters are often used in this way to provide confirmation that pumps are working properly. Conventional flow meters for large-bore pipelines can be expensive, however, and this expense is difficult to justify in an

application where precise flow measurement is not really needed. Another significant drawback with flow meters is that in some cases the flow meter can restrict flow and even cause blockages.

In light of these factors M-real Husum decided to try an alternative, innovative solution. As a pilot project the mill installed an ABB industrial drive with intelligent pump control (IPC) software to operate the pump in the return pipeline. One of the functions of IPC enables the drive to act as a sensorless flow meter: flow data is calculated by the drive based on power consumption, eliminating the need to introduce sensors into the pipeline.

IPC puts 'intelligence' into pumping applications

IPC is an optional software package for ABB's industrial drives. It incorporates all the functions commonly required by industrial plants, utilities, and other pump users.

IPC's flow meter function is used in single-pump installations to eliminate the need for a separate flow meter where the data is not

needed for invoicing purposes. In addition to the flow meter, IPC also includes multipump control, level control, anti-jam, pump priority, and sleep boost functions. As a result IPC can help pump users to save energy, reduce downtime, and prevent pump jamming and pipeline blocking.

Since installing the ABB industrial drive the mill has collected the two sets of flow data produced by the drive and conventional meter. The calculated and measured values have proven to be very close – there is typically a difference of less than two percent between the average values over an operating week. The drive is therefore providing reliable and accurate flow data without the need for a sensor.

“We have been very satisfied with the performance of the drive in this application,” says Hans Östman Automation Engineer at M-real Husum. “There are several other places in the mill where we use a flow meter to show that a pump is working, and we will probably replace some of these meters with drives in the future.



Solved problem

- Need to check flow in return pipeline from biological treatment plant to ensure that pump is operating correctly and cleaned water is being recycled into the process.

Solution

- ABB industrial drive with IPC software calculates flow data without the need for sensors in the pipeline.

Benefits

- Cost-effective solution compared to expensive flow meter.
- Eliminates need for additional equipment (measuring device, power unit) in harsh operating environment.
- No restriction to flow in the pipeline, so less risk of clogging and blockages.

