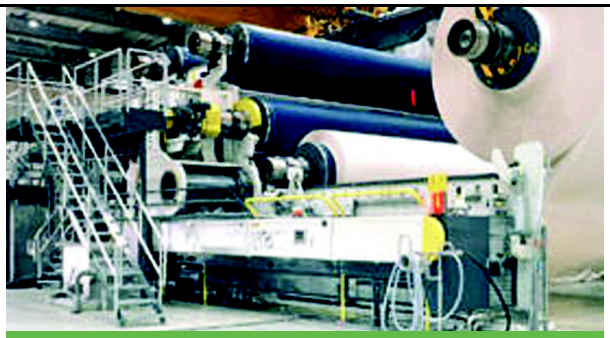
Norske Skog Bruck Restores Automatic Basis Weight Control and Increases Paper Production with High Process Noise Diagnostic

RESULTS

- Increased paper production by 1.5%
- Restored automatic control
- Reduced measurement variation from 10 L/s to 2 L/s
- Reduced raw material costs



"Several hours after commissioning the magnetic flowmeter, we had full confidence in the signal, allowing us to have automatic basis weight control."

Christian Trieb

Line Responsible PM4 - E - Automation - IT

APPLICATION

Basis Weight Control

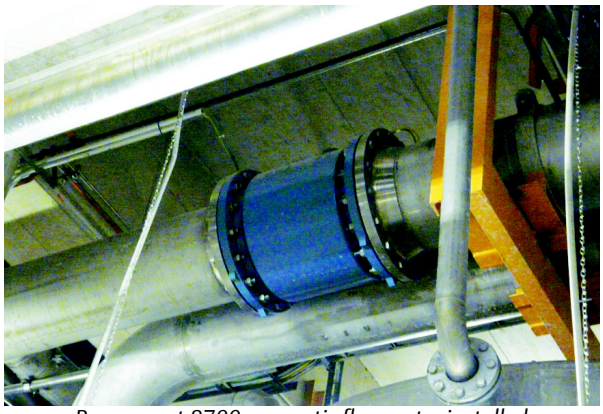
CUSTOMER

Norske Skog Bruck is a leading global producer of newsprint and magazine paper, with 16 paper mills around the world

CHALLENGE

This customer experienced instability in the output from the magnetic flowmeter installed in the basis weight flow line. As a result of the instability and variation in the signal, they were unable to reliably run their basis weight control loop in automatic mode. Even with damping applied in both the meter and the control system, there was still too much noise to control the speed of the basis weight pump effectively (See Figure 1). After pipe cleaning operations with a caustic soda solution, it would take up to 20 minutes for the competitor's meter to respond to a change in flow rate.

In order to compensate for the unstable signal from the basis weight flowmeter and ensure the final paper product met quality specifications, the basis weight set point needed to be set higher than the desired target point. In an effort to resolve the unstable output from the magnetic flowmeter, this customer made a service call to the manufacturer of the flowmeter. They were unable to find a problem with the existing flowmeter or provide a solution to combat the noise issue.



Rosemount 8700 magnetic flowmeter installed

SOLUTION

Emerson supplied a 16" magnetic flowmeter with the high process noise diagnostic on a trial basis. A planned shutdown was scheduled in three weeks, at which time the Rosemount magnetic flowmeter was installed. The other manufacturer's magnetic flowmeter was left in

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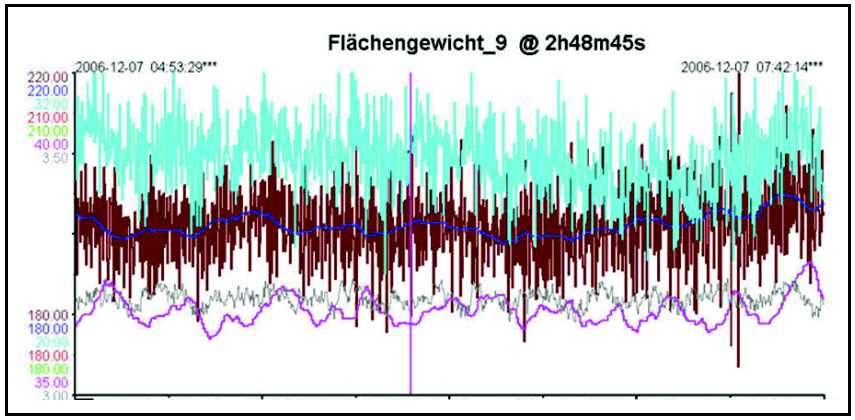
line in order to compare the performance of the two units. The existing flowmeter was set with 4 seconds of damping, while the Rosemount flowmeter was left at 2 seconds damping, the factory default.

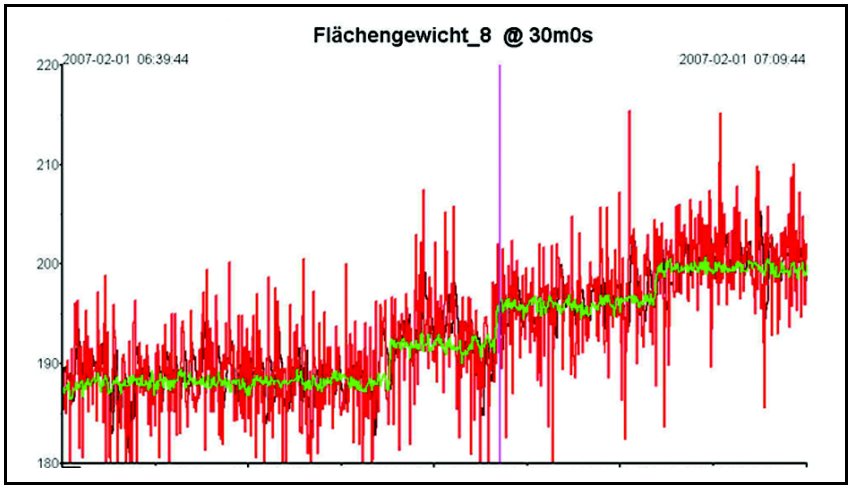
After installation, the Rosemount high process noise diagnostic indicated a low signal to noise ratio at 5 Hertz. By changing the coil drive frequency to 37 Hertz, the noise was significantly reduced when compared to the other manufacturer's flowmeter (See figure 2). Within an hour of operation, there was enough confidence in the stability of the signal that automatic control of the loop was restored (Figure 3). When directly comparing the two meters, the other manufacturer's meter had a variation of approximately 10 L/sec, while the Rosemount magmeter only showed a variation of 2 L/sec, a five times decrease in the measurement variation (figure 4). By reducing the measurement variation, the customer is now able to more accurately control the process. More accurate control resulted in reduced raw material usage and cull, and was one of the reasons for a 1.5% increase in paper production. After cleaning operations, the Rosemount magmeter responded to flow rate changes in 3 to 4 minutes, compared to a 20 minute response time of the competitor.

Figure 1



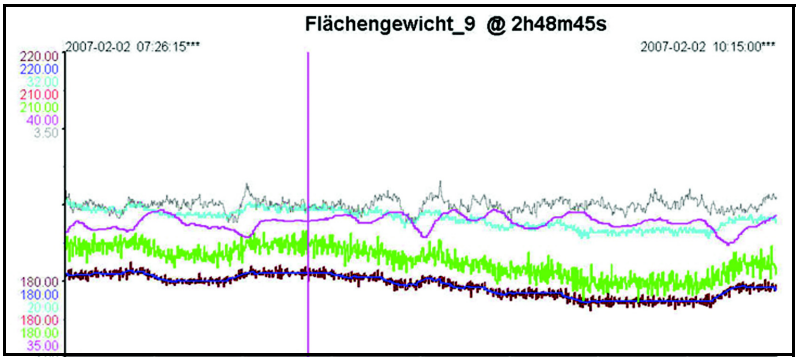
The light blue is the output from the controller to the frequency drive of the basis weight pump. The dark red is the other manufacturer's meter signal after it has been conditioned in the control system. Even with damping applied in both the meter and the control system, there is too much noise to control the speed of the basis weight pump.

Figure 2



This graph shows the performance of both flowmeters at the same time. The red line is the output from the other manufacturer's magnetic flowmeter with 4 seconds of damping. The green line is the output from the Rosemount magnetic flowmeter with 2 seconds of damping.

Figure 3

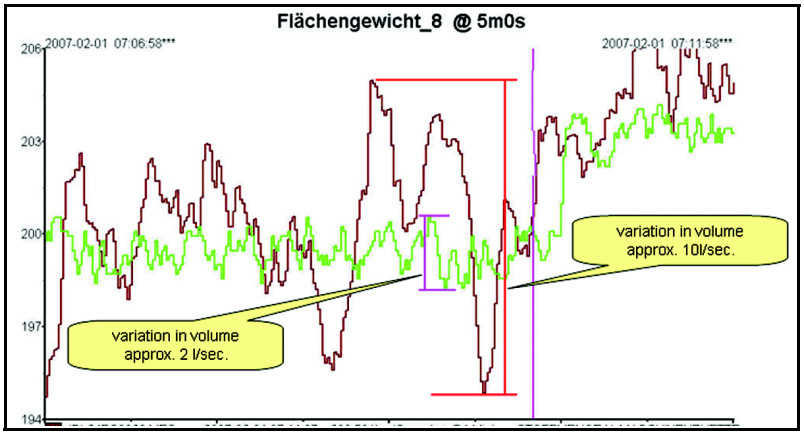


The graph above shows the situation after the Rosemount magmeter was installed. The green signal is the raw signal from the magmeter with 2 seconds of damping and the dark red line is the conditioned signal from the control system. The light blue line is the output from the controller to the frequency drive of the basis weight pump. There is much less variation in the output signal providing a much more stable control signal to the basis weight pump.

"The successful installation of the Rosemount magnetic flowmeter increased the throughput of the paper machine and was one of the reasons that we could increase paper production by 1.5%"

Christian Trieb
Line Responsible PM4 - E - Automation - IT

Figure 4



This graph shows the improvement in the output variation. The green line shows the Rosemount magnetic flowmeter with 2 L/s variation, while the other manufacturer shows 10 L/s in variation.

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RESOURCES

Emerson Process Management Pulp & Paper Industry

http://www2.emersonprocess.com/en-US/plantweb/customerproven/Pages/PulpPaper.aspx

Rosemount Magnetic Flowmeters

http://www2.emersonprocess.com/EN-US/BRANDS/ROSEMOUNT/FLOW/MAGNETIC-FLOWMETERS/Pages/index.aspx

Emerson Process Management
Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317 USA
www.rosemount.com
Tel (USA) +1 800 522 6277
Tel (International) +1 (303) 527 5200
Fax +1 (303) 530 8459

Emerson Process Management
Blegistrasse 23
P.O. Box 1046
CH 6341 Baar
Switzerland
Tel +41 (0) 41 768 6111
Fax +41 (0) 41 768 6300

Emerson Process Management Asia Pacific Private Limited
1 Pandan Crescent
Singapore 128461
T (65) 6777 8211
F (65) 6777 0947
Enquiries@AP.EmersonProcess.com

Emerson FZE
P.O. Box 17033
Jebel Ali Free Zone
Dubai UAE
Tel +971 4 811 8100
Fax +971 4 886 5465

Emerson Process Management Latin America
Multipark Office Center
Multipark Office Center
Turrubares Building, 3rd & 4th floor
Guachipelin de Escazu, Costa Rica
T+(506) 2505-6962
international.mmicam@emersonprocess.com

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