

Paper Mill Reduces Operations and Maintenance Costs with Advanced Guided Wave Radar Technology

RESULTS

- Reduced operations & maintenance costs
- Increased boiler system efficiency
- Minimized unplanned shutdown



APPLICATION

Bark Boiler Drum Level Control

CUSTOMER

Major Paper Mill in United States

CHALLENGE

A paper mill had problems with boiler trips during routine start-ups and sought to improve the system's reliability and accuracy. The bark boiler creates steam by burning waste bark from the trees being processed into paper. For safe operation of the bark boiler and for maximum heat transfer, the boiler drum levels must be kept within a control range of 8-in (20 cm). If the drum water levels get too low, the water tubes risk being uncovered and exposed to heat stress and damage. High drum levels risk water carryover into the steam header and exposing steam turbines to corrosion and damage.

This paper mill used DP transmitters with impulse piping to monitor the levels in the boiler drum. In this application, the DP transmitter is calibrated for full boiler operating pressure and temperature. During startup when the boiler is cold, both water and steam density are different than at operating temperature and pressure. If the level of the condensate in the legs is not equal, this density difference can cause an error in the level reading. If the difference in impulse leg condensate level is large enough, the boilers could trip during start-up which takes 30 minutes or more to recover.

They experienced many negative business results due to inadequate drum level control during routine start-ups. Unreliable drum levels risked high operations and maintenance costs to replace damaged water tubes and risked carryover into turbines. Unstable level measurements reduced efficiency of the boiler and increased utility costs. Lastly, unplanned process shutdowns directly translated to lost production.



Figure 1: Rosemount 5301 with Dynamic Vapor Compensation measures reliably on boiler drum

ROSEMOUNT[®]

For more information:
www.rosemount.com


EMERSON[™]
 Process Management

SOLUTION

To supplement the DP measurement, the paper mill installed a Rosemount 5301 Guided Wave Radar and High Pressure, High Temperature (HTHP) single lead probe with Dynamic Vapor Compensation (DVC). This device was mounted on a chamber. Since the flange temperatures were too hot for the transmitter electronics, the housing was mounted remotely. Guided Wave Radar technology is not impacted by density changes in the process and has no moving parts. Dynamic Vapor Compensation utilizes a unique probe design and firmware functionality to dynamically compensate for changes in the vapor space dielectric. This feature allows it to give accurate level readings during all process conditions from ambient to full output.

The paper mill experienced many positive business results by addressing boiler drum start-up problems. The Rosemount 5300 Guided Wave Radar with DVC reliably measured boiler drum levels at all times, thereby reducing operations and maintenance costs. The stable output increased boiler efficiency. Finally, the risk of the boiler tripping was reduced, thereby minimizing unplanned process shutdowns and increasing production.

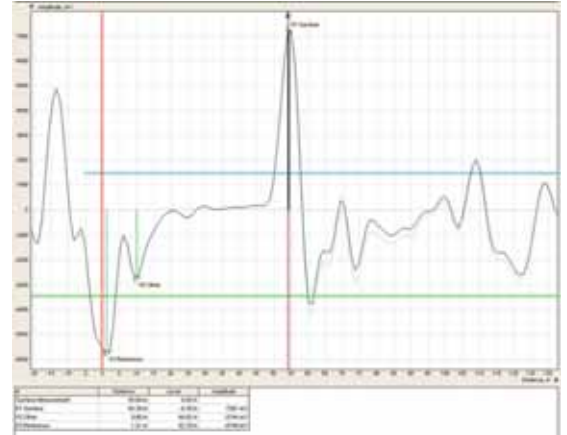


Figure 2: Echo plots shows a strong, reliable surface signal during all process conditions

RESOURCES

Emerson Process Management Pulp & Paper Industry

<http://www.emersonprocess.com/solutions/paper/>

Rosemount 5300 Series Guided Wave Radar

<http://www.emersonprocess.com/rosemount/products/level/m5300b.html>

Technical Note: Using Guided Wave Radar for Level in High Pressure Steam Applications

<http://www2.emersonprocess.com/siteadmindcenter/PM%20Rosemount%20Documents/00840-0100-4530.pdf>

The Emerson logo is a trade mark and service mark of Emerson Electric Co. Rosemount and the Rosemount logotype are registered trademarks of Rosemount Inc. All other marks are the property of their respective owners.

Standard Terms and Conditions of Sale can be found at www.rosemount.com/terms_of_sale

Emerson Process Management
Rosemount Division
8200 Market Boulevard
Chanhausen, MN 55317 USA
T (U.S.) 1-800-999-9307
T (International) (952) 906-8888
F (952) 949-7001
www.rosemount.com

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

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



For more information:
www.rosemount.com

