

Difficult Pulp Stock Measurement Problem Solved With Radar Level Transmitter

RESULTS

- Increased measurement reliability, especially during start up of pulp production
- Reduced water consumption with no flushing necessary
- Reduction of installed electric energy
- Reduced maintenance costs



APPLICATION

Pulp stock tank level measurement

Application Characteristics: High temperature, steamy vapors, splashing, wet sticky paper fibers, and irregular tank.

CUSTOMER

Atlantic Packing Inc., Whitby, Ontario Canada

CHALLENGE

Atlantic Packaging is a leading manufacturer of paper products from recycled material. After the de-inking process, the pulp is transferred by a screw conveyor to a large concrete tank to be mixed with water for use on the paper machine. It is essential that the operators know the level in the stock tank to control the feed rate of the screw conveyor and to ensure the pulp stock is maintained at a sufficient level to feed the paper machine.

Access to the tank is limited and any alterations would be very expensive. Ultrasonic technology was tried with limited success. The steam in the vapor space created errors in the reading and often prevented a valid reading. At times, pulp splashing on the sensor prevented it from getting any measurement.

SOLUTION

Since radar is unaffected by vapor space changes, it was chosen as an alternative to the ultrasonic device. A Rosemount 5600 non-contacting radar with a parabolic antenna was installed. The parabolic antenna was chosen because it would provide the strongest signal for this steamy environment with the splashy, turbulent surface.

The radar gauge worked well immediately, but over time the antenna would get covered with enough pulp to weaken the signal and eventually lose the reading. Hosing down the antenna would fix the problem, but this was a reactive solution. The customer needed a way to predict when the signal was getting weak in order to prevent signal loss and maintain the measurement.

Not only do they have meaningful level measurement, but the operators can also monitor the signal strength.



Parabolic Antenna covered in pulp stock. Flushing lines for cleaning are installed near the edge of the dish.

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The transmitter head was replaced with one that had a secondary analog output option. The second output was used to indicate the signal strength of the radar. When the antenna is clean, the signal strength for this application is about 1600 mv. As it gets dirty, the signal strength will degrade to less than 400 mv. At this point, cleaning can be scheduled.

The mill now has a meaningful level measurement that allows the pulp level to be held at an optimum height, providing sufficient pulp to the paper machine. In addition, the level can be used to control the screw conveyor so that the tank is not overfilled. The operators can also monitor the signal strength and clean the antenna before the signal is lost, preventing unexpected maintenance.



The 5600 was installed with a second analog output line so that signal strength could be monitored.

RESOURCES

Emerson Process Management’s Chemical Industry Page

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

Rosemount 5600 Series Radar Level Transmitters

<http://www.emersonprocess.com/rosemount/products/level/m5600.html>

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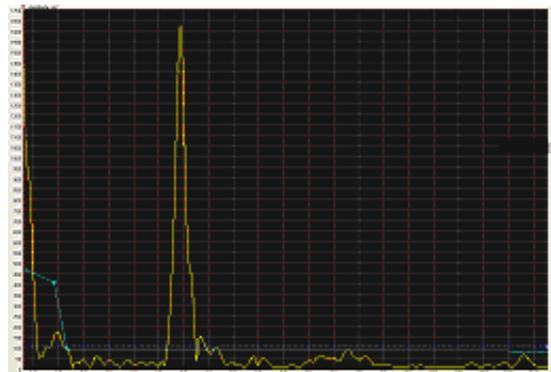
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The parabolic antenna was chosen because it would provide the strongest signal.



Tank Plot before cleaning the antenna



Tank Plot after cleaning the antenna



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