

Finnish Paper Mill Successfully Measures Sawdust Silo Level with Radar Transmitter

RESULTS

- Measurement reliability improved due to stronger signal from parabolic antenna
- Easily accessible device parameters allow optimized settings
- Maintenance-free operation since startup



APPLICATION

Sawdust Silo Level Measurement

Application Characteristics: Dusty, dry, small particles, low dielectric (<2), 14 m (46 ft) high silo

CUSTOMER

A Finnish paper mill

CHALLENGE

A Finnish paper mill needed a replacement level measurement for their sawdust silo. Their older ultrasonic device had stopped working. Even when it worked, its measurements were not reliable, and the device often failed during the filling cycle when there was a lot of dust. They were looking for an alternative measurement.

The silo is approximately 14 meters (46 ft) high. The sawdust enters the silo on a conveyor belt which drops the sawdust into the top center of the silo. The sawdust forms a steep hill which changes in shape and slope as the sawdust drops into place. The silo empties from the bottom with hydraulic wipers.

They originally decided to try radar since radar can handle dusty environments better than ultrasonic technology. Initially, they tried a radar gauge with a cone antenna, but there was no discernible signal. When approached by Emerson Process Management, they were skeptical of radar, but willing to try another variation.

SOLUTION

An evaluation of the installation indicated that there was enough room to install a parabolic antenna. With this low dielectric material, it is crucial that signal strength be maximized. Even a large cone antenna would not provide a strong enough signal for surface detection. For low dielectric materials and longer distances, a parabolic antenna could provide the needed difference in signal strength.



*Sample of the sawdust.
Note: Ruler is in centimeters.*



The Rosemount 5600 is installed near the corner of the silo.



The only available space for mounting instrumentation was near the corner of the silo, about 1 meter (3 ft) from each wall. Because it was mounted away from the conveyor entry point, there was a clear view of the surface.

A best installation practice is to mount the antenna so that it reaches as far into the tank as possible. This will minimize disturbances from the top of the tank and allow for a better signal-to-noise ratio in the low dielectric solid application.

A Rosemount 5600 Series Radar Transmitter with a parabolic antenna was installed in the available space. The parabolic antenna provides a narrower concentrated beam to the surface than any cone antenna. This is an essential element for measuring materials where there are poor reflections due to the material and surface characteristics.

Another essential element in measuring solids is the software capability of the device. The device has easily accessible parameters that control signal handling functions such as time delays, surface search, and echo filtering. However, many of these parameters need to be optimized for individual applications. The advanced diagnostic software capabilities allowed these changes to be made easily and the issues were resolved satisfactorily.

An Emerson Process Management service engineer assisted with the startup of the 5600 on this sawdust silo. The 5600 has been operating successfully since startup.

RESOURCES

Emerson Process Management Pulp & Paper Industry

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

Rosemount 5600 Series Radar Level Transmitters

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

Measuring Solids with Rosemount 5600 Non-Contacting Radar

See Document Number 00840-0100-4024

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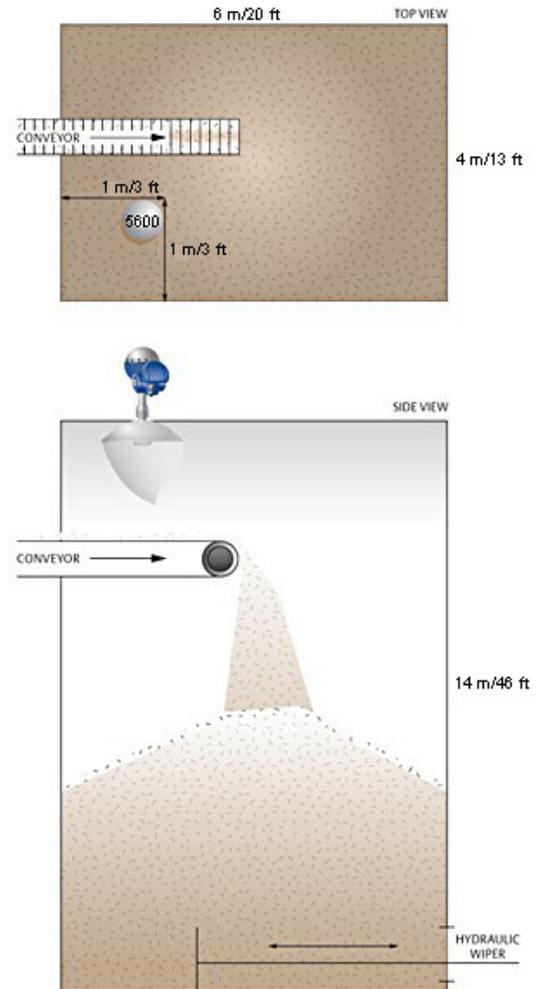
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The top and side views of silo.



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