

Robust Level Measurement Provided for Lube Oil Blending Tank

RESULTS

- Reliable level measurement despite turbulence
- No affects from vapor space changes
- Maintenance-free operation



APPLICATION

Blending Tank

Application Characteristics: Low dielectric, turbulent fluid with vapors, internal obstructions

CUSTOMER

A major oil company in South-East Asia

CHALLENGE

This oil company uses Base Oil for blending into lubricants. The blending process is comprised of mixing in chemical additives, heating, and agitating the mixture.

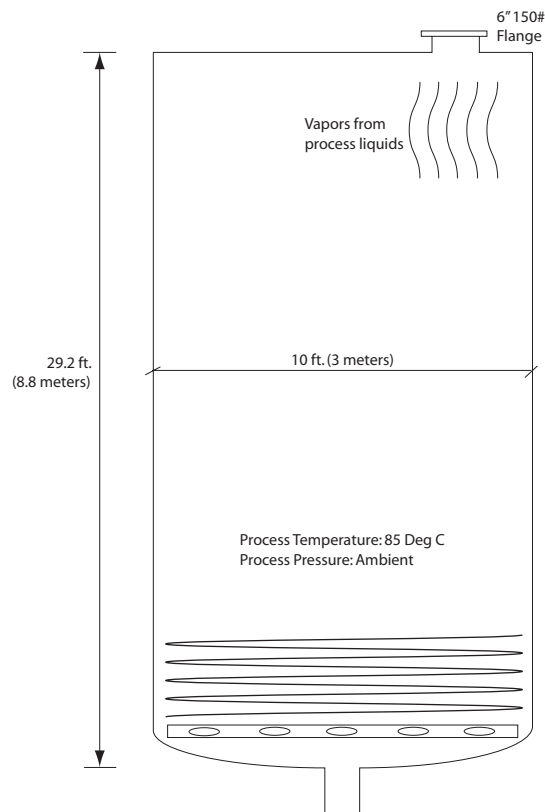
A pulsed air system causes the agitation required for the blending process. This also causes the tank to shake and vibrate vigorously. Running steam through serpentine type coils heats up the process to 85° C (185° F). With the combination of agitation and heating fluctuations, the surface of the fluid becomes very turbulent.

The previous ultrasonic level transmitter failed due to heavy turbulence caused by the agitation. The heated process environment caused vapors to form. The resulting condensation also contributed to the failure of the ultrasonic. The customer needed a reliable device that would overcome those problems and provide an uninterrupted level reading.

SOLUTION

A Rosemount 5401 low frequency radar transmitter with a 6-in. cone antenna was installed on this blending tank. With radar, the level measurement accuracy is unaffected by changes in the vapor space.

The Rosemount 5401 was a great fit for this application with vapors and turbulent surface conditions. The low frequency signal of the Rosemount 5401 is better able to handle condensing vapors than a high frequency device. The transmitter also uses dual port microwave technology that results in a two times better signal-to-noise ratio than other radar transmitters. This is especially important in low dielectric, turbulent applications where the return signal can be very weak.



Blending oil tank with pneumatic agitation and steam coils

ROSEMOUNT

For more information:
www.rosemount.com


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In addition, the cone antenna design of the 5400 is more resistant to the build-up of any condensation. Combining the low frequency microwave signal with the dual port technology and a condensation resistant antenna delivers a reliable level measurement for this application with heavy condensing vapors and turbulence. The end result is a maintenance free reliable level measurement.

To ensure continuous reliable operation on the tank, radar devices must be configured for the specific tank to be able to handle false echoes and influences from tank obstructions, the bottom, and the roof. The false echo handling software includes several parameters including:

- amplitude threshold curves
- inactive zones
- bottom echo handling
- false echo registration

The false echo registration enables weak surface echoes to pass strong false echoes. It is important that the echo handling of the radar is configured for the specific application to ensure a reliable and continuous measurement. For many radar devices start-up can be time consuming, especially with difficult applications.

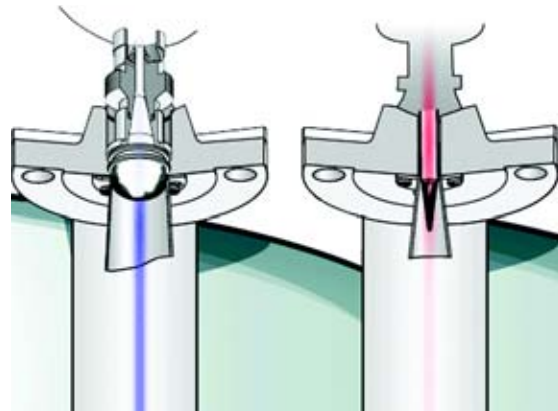
The 5400 series reduces the start-up time considerably because it has a built-in function block called "Measure and Learn." When activated by the user, this function block automatically selects the best false echo suppression tools and settings by using a series of logic decisions. The built-in logics of the Measure and Learn functionality are a result of 30 years of radar experience.

The customer finds the Rosemount 5401 to be an ideal, reliable solution for this application.

RESOURCES

Rosemount 5400

<http://www.emersonprocess.com/rosemount/products/level/m5400.html>



The cone antenna design of the 5400 (left) is more resistant to condensation build-up. Combining the low frequency microwave signal with dual port technology and the condensation resistance delivers a reliable measurement.

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