

Major Tobacco Manufacturer Improves Process Consistency and Inventory Management

RESULTS

- Reduced measurement variability due to density change immunity
- Reduced operations cost due to more stable level readings
- Reduced installation cost by eliminating tank modifications



APPLICATION

Liquid Carbon Dioxide (CO₂) level measurement

Application Characteristics: Liquid CO₂ tank; dielectric constant - 1.6, clean, clear fluid, continuous flow; heavy vapors and flashing cause changes in density.

CUSTOMER

A major tobacco manufacturing company in Australia

CHALLENGE

A major tobacco manufacturing company in Australia uses liquid CO₂ at -13°F (-25°C) and 362 psi (25 bars) to process tobacco. The liquid CO₂ is stored in a horizontal bullet which is 11.5ft. (3.5m) high and needs a reliable level measuring device.

The liquid CO₂ from this tank serves as a feed to the next process of expanding the tobacco leaves. The level in this storage tank has to be maintained correctly to keep continuous flow of liquid CO₂ and facilitate the automatic ordering process.

The customer used differential pressure technology which had unsatisfactory results due to the heavy vapors and flashing of the product which caused the density to vary. The level reading was always fluctuating and unreliable.

Load cells were also tried on this application but they weren't easy to calibrate. The variable density would have affected the measurement as well.

SOLUTION



The best sensor/transmitter choice is radar due to its immunity to density changes. The Rosemount 3300 Guided Wave Radar Level Transmitter with a Coaxial probe gave the customer a reliable level reading. The dielectric constant of liquid CO₂ (1.6) is suitable for the coaxial probes.

The level transmitter reduced measurement variability and operations costs so that the customer was able to manage the CO₂ supply more accurately.



Neither differential pressure or load cell technologies gave the desired result

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A pressure relieving valve was part of the nozzle, so an extension was made to suit the installation. The best implementation practice is guided wave radar. The coaxial probe is immune to disturbances from obstructions, such as the valve, so the customer did not make any major modifications on the existing opening during installation.

The level transmitter reduced variability in the measurement. It also reduced operations costs because the customer was able to manage the CO₂ supply more accurately.

RESOURCES

Rosemount 3300

<http://www.emersonprocess.com/rosemount/products/level/m3300.html>

Emerson Process Management's Food and Beverage Web Page

<http://www.emersonprocess.com/foodandbeverage/>



The Rosemount 3300 installed on the horizontal liquid CO₂ storage tank.

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