

Chemical Company Reduces Maintenance Costs in High Temperature and Pressure Application

RESULTS

- Reliable replacement of nuclear gauge
- Robust signal despite process conditions
- Minimized condensation and deposits in the antenna
- Reduced maintenance costs



APPLICATION

PTA Crystallizer, 3rd stage

Application Characteristics: Pressure of 289 psi (20 bar) and temperature of 450 °F (232 °C) agitation, occasional foam. Purified Terephthalic Acid Slurry. Product tends to solidify at cooler temperatures and form deposits over time.

CUSTOMER

BP Chemical, Cooper River, SC

CHALLENGE

BP Chemical's Cooper River site had been using nuclear level gauges to measure their higher temperature and pressure PTA crystallizers. The combination of the higher pressure and temperature along with agitation and the continual precipitation of solids eliminated the use of most other level technologies.

The style of nuclear gauges on these vessels included a detector that was inside the vessel. While it could handle the heat and pressure and most process changes, it would gradually become coated. The coating eventually built up enough to cause erroneous level readings.

SOLUTION

BP Chemical installed the Rosemount 5600 Radar Level transmitter with a special quartz process seal that could handle the pressure and temperature conditions. In addition, the Rosemount 5600 had the capability of filtering out signal noise resulting from agitators, baffles, and other internal objects.

The installation nozzle was midway between the agitator and the wall. From this position, the radar beam could detect the smallest disturbances. The installation nozzle was a 6 inch nozzle that was 19 inches (0.5 m) tall, allowing the head of any device to be easily accessible from the floor above the tank. Because of the longer nozzle, an extended cone antenna was



The Rosemount 5600 is on a nozzle that allows easy accessibility at floor level. The flange and nozzle of the 5600 are insulated to prevent condensation on the antenna in this potentially cooler area.



The 19-in. (0.5 m) insulated mounting nozzle allows the head of the gauge to be above the floor level.

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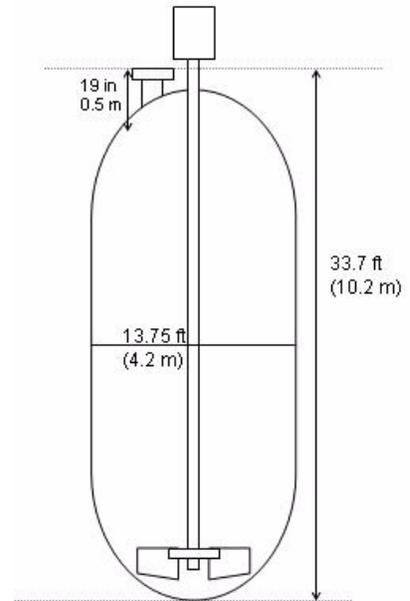
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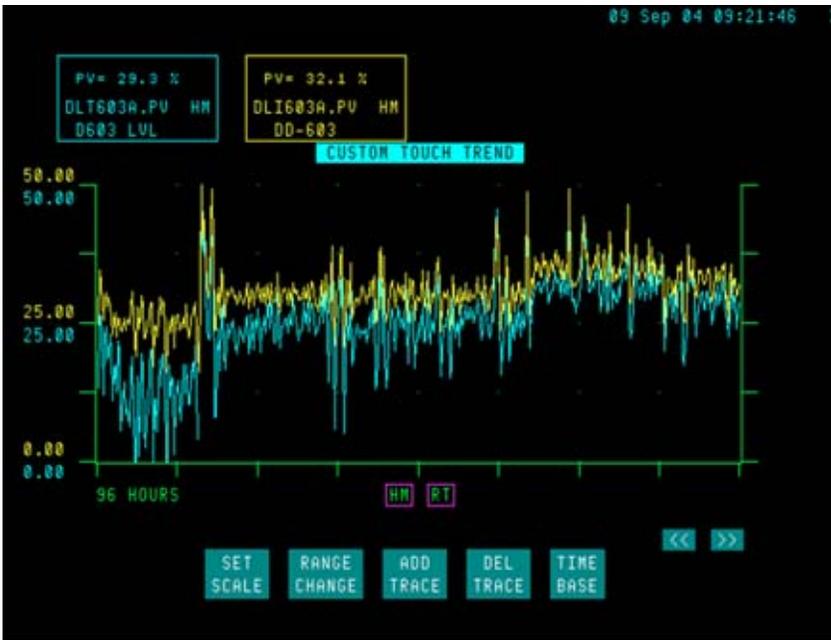
used to ensure that any disturbances from the nozzle were eliminated by the antenna walls.

Initially, with this longer nozzle, some condensation occurred in the cooler areas and attenuated the radar signal. Insulation was added around the nozzle and over the mounting flange to keep the antenna and waveguide free of condensation.

Engineers AJ Lambert and Jennifer Kessler are very satisfied with the performance of the third crystallizer radar level transmitter and know the operators are too. They keep it on the Rosemount 5600 radar for control all the time.



The rough dimensions of tank and nozzle.



Comparison of the 5600 radar trend (yellow) with the Nuclear level trend (blue). The trend of the nuclear device at the lower levels is thought to be incorrect due to more deposits in the lower areas.

RESOURCES

Rosemount 5600

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

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