

# Vopak Terminal increases efficiency and reduces risk by combining two radar level gauges

## RESULTS

- Improved inventory control
- Reduced risk of tank overfill
- Less operating and maintenance costs
- Easy installation on an existing opening, while the tank was in operation



## APPLICATION

Inventory control and overfill prevention of liquid heavy fuel oil, heated to 50-70 °C (120-160 °F) in a 21m (70 ft.) tall storage tank.

## CUSTOMER

Vopak Terminal in Gothenburg, Sweden

## CHALLENGE

The existing tank gauging system was installed in the early 80's and needs to be replaced due to product obsolescence and lack of spare parts. Additionally, the existing mechanical switch used for overfill prevention has no diagnostics and requires frequent proof testing. This procedure, which requires permits, has to be done manually on the tank roof and interferes with normal operation.

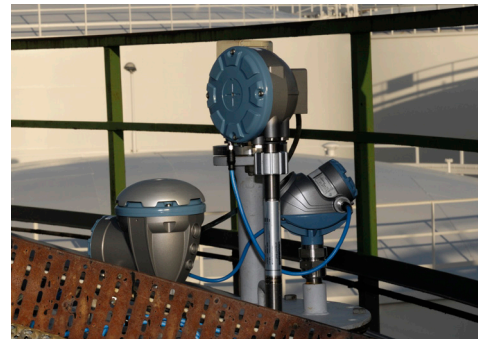
The tank has only one opening available and adding more is cost-prohibited, especially since the tank is insulated. Consequently, all measurement devices – level, temperature and overfill – have to enter the tank through the same opening. The product is viscous and therefore mechanical gauges with moving parts can not be used. It is not acceptable to take the tank out of service for installation of the new tank gauging system.

## SOLUTION

Vopak decided early that radar-based tank gauging was the best solution for current and future needs. Mainly because it has high accuracy, no moving parts, is maintenance-free, needs no re-calibrations and will fit all their products, both chemical and hydrocarbon. But what was the best solution for their overfill prevention requirements? The facility turned to Emerson Process Management. After evaluation, a solution based on the Rosemount Tank Gauging System was proposed:

- Primary Level Gauge: Rosemount 5900S Radar Level Gauge with Parabolic Antenna.
- Secondary Level Gauge: Rosemount 5300/5400 Radar Level Gauge.

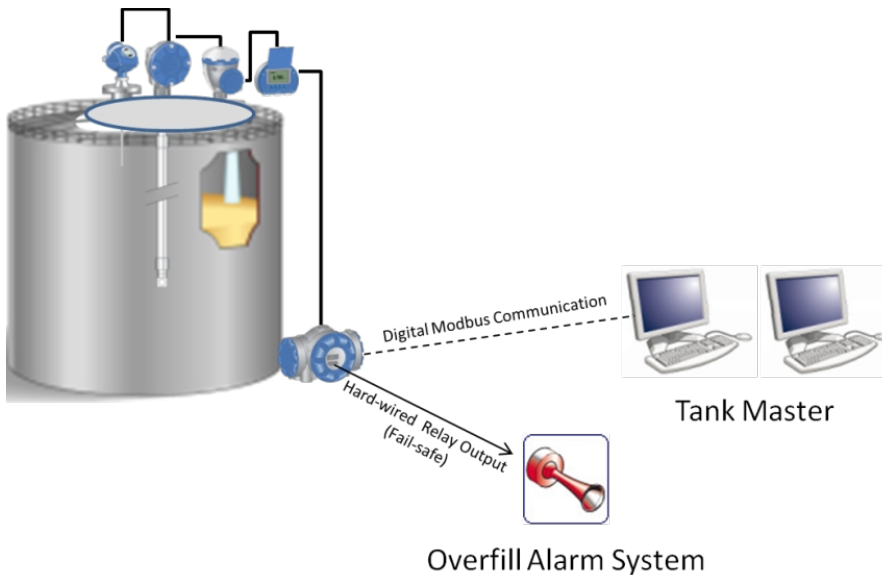
**Improved tank utilization and considerably reduced proof-testing intervals.**



*The Rosemount 5900S, 2240S and 5300/5400 gauges for level, multipoint temperature and overfill measurements mounted on the same manway.*

## TANK GAUGING

- Temperature Measurement: Rosemount 2240S Temperature Transmitter with Rosemount 565 Multiple Spot Temperature Sensor.
- Operator Interface: Rosemount TankMaster Software.



*Layout of the Rosemount Tank Gauging System on Tank TK350.*

The primary level gauge and multiple spot temperature measurement will be used for operational purposes and the net volume calculations, and the secondary level gauge will be used for overfill prevention.

There are consequently two radar level gauges on the same tank, both measuring the level continuously. The primary level measurement's accuracy requirement was 0.5 mm and therefore the 5900S Series FMCW radar gauge was selected. Vopak did not have the same accuracy requirements for the secondary level measurement and therefore the 5300/5400 pulse radar transmitter was selected.

A major advantage with this solution is that also the overfill measurement is continuous, as opposed to traditional solutions where point-level switches are used. The operators now have two online level measurements from the same tank which they can compare. An automatic alarm will indicate if the two measurements deviate. As a result, the proof-testing intervals have increased significantly compared to the previous point-level solution. Additionally, operators have gained confidence and can now operate the tanks faster and with a higher utilization rate. Another benefit with this solution is that all three transmitters could be mounted on the same DN600 (24-in.) flange, and were installed without taking the tank out of service. In fact, the complete installation took less than six hours to complete, including issuing permits, carrying all parts to the tank roof, mechanical and electrical installation, and commissioning.



*The Rosemount 2230 Graphical Field Display mounted right next to the hand-dipping hatch.*



*The Rosemount 2410 Tank Hub mounted at the bottom of the tank where power is already available and the display is easily accessed.*



*The TankMaster inventory management software is used for net volume calculations, batch transfers, reporting, alarm handling, commissioning and service.*

**ROSEMOUNT**  
Tank Gauging

Emerson Process Management

**Rosemount Tank Gauging**  
Box 130 45, SE-402 51 Göteborg, SWEDEN  
T: +46 31 3370 000 F: +46 31 25 30 22  
E-mail: sales.rtg@emerson.com  
[www.Rosemount.com/TankGauging](http://www.Rosemount.com/TankGauging)

  
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