

SINOPEC Refinery Increases Vapor Recovery and Liquid Product Measurement Accuracy at Truck Loading Terminal with Preset Controller

RESULTS

- Uniquely measured liquid and vapor simultaneously
- Measurement accuracy within 0.2%
- Transporters reliably charged for loaded product without including recovered vapor
- Refinery can ascertain amount of vapor recovered during custody transfer
- Compatible interface with DL8000™ presets and Micro Motion™ Coriolis Meters



APPLICATION

Refinery truck loading rack and vapor recovery monitoring system

CUSTOMER

SINOPEC Refinery and Chemical Company, Zhenhai, Zhejiang Province, China

CHALLENGE

The refinery loaded a single non-blended liquid product, propylene oxide, on tank trucks at its 3-inch forward loading line. Each of the ten loading installations also had a 1-inch line to return recovered vapor back into the refining process. Previously, the liquid was measured by gross volume which included an unknown amount of vapor. The vapor, recovered and not vented to the atmosphere, was not measured and, therefore, unaccounted for.

The transport company was charged for the gross volume of liquid / vapor in the custody transfer. This measurement resulted in inaccurate customer bills of lading without credits for product recovered. Additionally, the vapor recovered was not accounted for by the refinery, resulting in inaccurate inventories of product delivered.

The DL8000 with the Micro Motion coriolis meter measures the mass of the fluid so no volume corrections are required to compare gas and liquid volumes.

The normal liquid flow was 39,000 kg/h at the forward loading line, while the normal return line had a normal flow of only 115 kg/h. The low vapor flow made measurement options difficult and unreliable using turbine meters or other volumetric measurement devices.

SOLUTION

By installing the DL8000 Preset Controller, in conjunction with a Micro Motion 300 CMF coriolis meter on the forward loading and 100 CMF meter on the vapor return line, the refinery was able to employ an Emerson solution. The DL8000 with the Micro Motion coriolis meter measures the mass of the fluid so no volume corrections are required to compare gas and liquid volumes. It accurately measured both the mass of the propylene oxide liquid and the mass of the recovered vapor simultaneously at each loading installation with the same device, and calculated them consistently. The net delivered product could be easily calculated using mass measurement.

The DL8000 allowed a net delivery calculation, giving the customer accurate and reliable delivery receipts. It provided the refinery an accounting of vapor recovered and returned to the system, with an accuracy of better than 0.2%. The refinery then had a highly accurate inventory of product delivered in this batch process.

In the past two years, the refinery has installed 10 DL8000 Preset Controllers for this specific application. The plant additionally operates a total of 47 DL8000 for loading arms for other hydrocarbon products not requiring vapor recovery.



Global Headquarters

Emerson Process Management
Remote Automation Solutions
6005 Rogerdale Road
Houston, TX, USA 77072
T +1 281 879 2699
F +1 281 988 4445

www.EmersonProcess.com/Remote



Europe

Emerson Process Management
Remote Automation Solutions
Unit 8, Waterfront Business Park
Dudley Road, Brierley Hill
Dudley, UK DY5 1LX
T +44 1384 487200
F +44 1384 487258



North America and Latin America

Emerson Process Management
Remote Automation Solutions
6005 Rogerdale Road
Houston, TX, USA 77072
T +1 281 879 2699
F +1 281 988 4445



Middle East and Africa

Emerson Process Management
Remote Automation Solutions
Emerson FZE
PO Box 17033
Jebel Ali Free Zone - South 2
Dubai, UAE
T +971 4 8118100
F +1 281 988 4445



Asia Pacific

Emerson Process Management
Remote Automation Solutions
1 Pandan Crescent
Singapore 128461
T +65 6777 8211
F +65 6777 0947

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