

# North American Refinery Improves Tank Dewatering Safety and Operation with ELITE™ Coriolis Flow Meters

## RESULTS

- Less than 1 gallon (~4 liters) of hydrocarbon per draw
- Improved process and personnel safety via automation of dewatering process and detection of hydrocarbon break
- Eliminated inaccuracies in mass balance
- Greatly reduced operator exposure to VOCs during dewatering process



## APPLICATION

Offsites Tank Dewatering

## CHALLENGE

A common operational challenge with hydrocarbon storage tanks is the accumulation of water in tanks. Periodically, water needs to be drained from storage tanks to reduce corrosion and other potential process problems. There are many methods utilized for dewatering tanks. At this refinery, operations was manually overseeing the dewatering process and closing a manual valve once hydrocarbon withdrawal started to occur. The results varied between operators as well as processes fluids. For example, some hydrocarbon products such as naphtha resembled water. Other potential risks included sending excessive hydrocarbon product in the discharge to the sewer system, volatile organic compound (VOC) emissions, environmental fines, safety incidents, and even mass balance inaccuracies in cases where excess water was left in tanks and accounted for as hydrocarbon product.

## SOLUTION

To improve the tank dewatering operation, the refiner installed 2" Micro Motion™ ELITE™ Coriolis flow meters and the Micro Motion 2700 Multivariable Flow and Density Transmitters on 25 tanks. Coriolis flow meters directly measure density and mass flow and are an ideal use for interface detection between the hydrocarbon and water. The Micro Motion ELITE Coriolis flow meter was selected due to the high accuracy measurement for mass flow of  $\pm 0.10\%$  of rate and density of  $\pm 0.0005 \text{ g/cm}^3$ . The 2700 transmitter was configured to use API tables to set up an event triggered output that detects hydrocarbon at around 5% break through.

ELITE Coriolis flow meters can be used to detect interface changes in applications like tank dewatering



## REFINING

For the crude storage tanks, a fully automated system was implemented that incorporated a motor control valve actuator. This was included on crude storage tanks due to the large volumes of water coming in from crude shipments by marine vessels. When the hydrocarbon break through occurs, the valve is automatically closed.

For other tanks, a light signal was activated when the changes in the density of fluid occurred. This light signal alerted operators to manually close the valve. By adding automation to the dewatering process, less than 1 gallon (~ 4 liters) of hydrocarbon discharge occurred per draw.

Future project plans include potentially implementing this automated solution on additional tanks as well as adding a Wireless THUM adapter to provide additional data that can be used for real time analysis of water sent to the sewer.



Fully automated configuration with valve actuator



Semi-automated configuration with light alert for event trigger

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