Used Oil Refining

Industry: **Oil & Gas**
Product: **Field Instruments**
RotaMASS Coriolis Mass Flow Meter

Introduction

Necessary oil is a family owned oil re-processor with a presence in the states of Tennessee, Virginia, North Carolina, South Carolina, West Virginia, Kentucky, Indiana, Ohio, and Pennsylvania.
A fleet of trucks pick up used oil and discarded coolant from oil change shops and industrial users. Waste water from industrial customers and leachate from land fills are also submitted for processing. The used oil is filtered and chemically purified and resold as #4 fuel oil to industrial users, asphalt plants and municipal power plants for firing furnaces and boilers. Industrial waste water and land fill leachate is treated to the point where it can be released into the municipal system.

Accurate tracking of the facility's intake and output is needed as multiple state and federal agencies and environmental programs are involved. Since re-refined oil is considered a renewable resource it qualifies for various state and federal energy credits or pollution programs, so accurate accounting is critical.

Mark Byington, Project Management and Environmental Compliance and Lab Technician Robin Hashbarger.

Application

When the trucks return to the facility, the used oil or waste products are pumped into holding tanks. Since there is little control over what may be recovered from the customer's waste tank, almost any liquid could be put through the meter. P/D meters will not tolerate the solids or particles, mags will not work since the process is predominantly hydrocarbons and non-conductive. Vortex will not work well because of the viscosity and the particles.

As the truck drains, it's also common for there to be large air slugs. This would cause other coriolis manufacturer's meters to "stall" and it might take a significant amount of time for the meter to restart. During that time, the meter is not reading, and the amount of oil that passes through the meter is not accounted for.

Necessary Oil pays for the used oil based on volume, so it's important to accurately know how much oil has been picked up. Since water can not be sold after it's been processed, it's of no value to Necessary Oil. If water is mixed in with the used oil, the customer is overpaid and that money is lost to Necessary Oil with no way to recover it.

Solution

RotaMASS is ideal for this application, as it does not matter if the media is aqueous or is conductive. RotaMASS can tolerate high levels of entrained air and is not sensitive to viscosity changes.

Also, since the unloading rack is outdoors and there are large seasonal temperature swings, the RotaMASS has the advantage of making a direct mass measurement. Temperature compensation is not an issue as it would be with volumetric or mechanical meters.

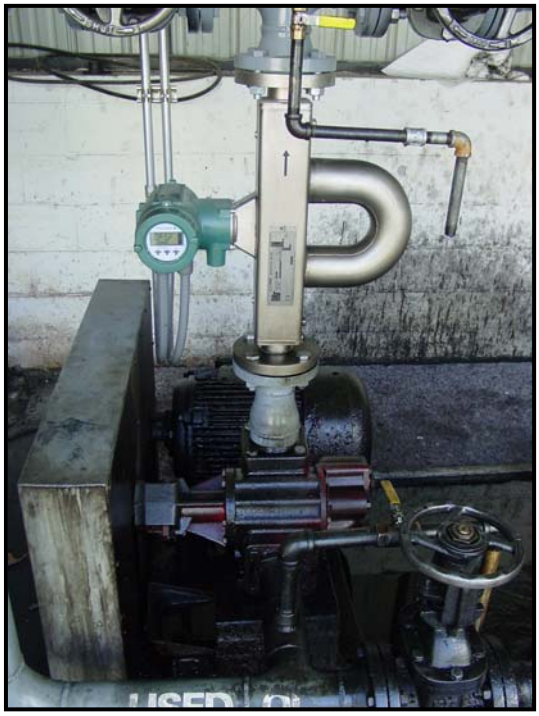
Since water and oil have different densities, RotaMASS can monitor density and alert the operator to the fact that it's seeing something other than oil, performing what is basically a net oil calculation.

Necessary Oil mounted the RotaMASS directly to the outlet side of the unloading pump. Mounting the competition's meter in this location would not be recommended due to vibration, but RotaMASS' box in box design and other technically advanced features allow the meter to operate properly where other meters won't.

Necessary Oil has put well over one million gallons of used oil and waste products through the RotaMASS and have been extremely pleased with the meter's performance.

According to Mark Byington owner/manager of the Bristol TN Facility, the RotaMASS' advantages are its ability to measure everything they put through it, its ability to tolerate air at the bottom of the trucks during unloading, and its overall ruggedness and reliability.

The first load measured after the installation of the RotaMASS had a large quantity of water mixed in with the oil. By monitoring the density of the product coming from the truck, the water was detected. The customer was paid only for the oil, not for the water, which resulted in a savings of over $900! Mark commented that the meter paid for itself in the first three months of operation.



The RotaMASS meter mounted on the unloading station pump

The RotaMASS Display