"My production costs are too high."

Petroleum refining is a highly energy-intensive process... Energy use accounts for approximately 50% of refining costs.

Ven V. Venkatesan, "Optimize Energy Costs in Petroleum Refineries, Part 1", 2012. www.chemicalprocessing.com/articles/2012/optimize-energy-petroleum-refineries-part1/

What if...

- You could eliminate 90% of the variability in energy content of your fuel gas?
- You could identify and minimize losses?
- You could could minimize downtime?

How do you keep your costs down?

Like every oil company executive, you have targets to meet and a budget to adhere to—and you're evaluated based on how well you meet these mandates. When supplies are plentiful and energy is cheap, it's fairly easy to keep your operation, and your costs, in balance. But as your refinery ages, it becomes more difficult to keep costs down. Equipment deteriorates and must be replaced. Instruments fail, creating costly downtime. And the cost of energy required to run your plant continues to rise.

You're challenged to meet your production targets at an acceptable cost, but excess maintenance expenses and the rising price of fuel are putting your margins at risk.

Refinery managers we talk to tell us about challenges like these:

"Energy costs are hurting my bottom line."

Energy- everything from the price of purchased fuel to demand from your boilers, fired heaters, and rotating equipment- consumes a tremendous portion of your operating budget. You'll do everything possible to reduce consumption and optimize fuel use. Proper management of the combustion process provides the highest, most stable output from your energy use. Poor combustion control results in wasted energy, excess emissions, and higher costs.

"Our refinery losses are too high."

Your plant-wide material balance isn't where you'd like it to be. The problem is, you're not sure how much of that unaccounted material is due to real losses or simply measurement inaccuracy. You also wonder if you're getting all of the feed you're paying for, whether that is crude oil or natural gas.

"Excessive downtime costs time and money."

Preventative maintenance is an important part of keeping the refinery up and running. However, unnecessary maintenance not only lowers throughput, but also costs the refinery money. Your preventative maintenance schedule is built to avoid failure, but you wonder if it is optimized.

REFINING

Minimize loss and uncertainty

OPTIMIZE FUEL USE AND IMPROVE HEATER PERFORMANCE

Boilers and fired heaters are often run below their capacity to allow for sudden swings in heating value due to fuel composition changes. More stable control provides higher unit throughput, and more efficient energy use. Combustion control is improved by accurate fuel heating value measurement. This is particularly challenging when your fuel is constantly changing, whether from the inherent composition changes in refinery fuel gas, or from supplementing with natural gas. Traditional volumetric flow meters are affected by this changing composition and the resulting change in specific gravity, leading to measurement uncertainties that can be greater than 10%. Micro Motion Coriolis meters directly measure the mass flow rate of the fuel gas, reducing the sensitivity of flow measurement to changing gas compositions by a factor of five. In addition to this measurement improvement, the Micro Motion 3098 Gas Specific Gravity meter can directly measure the specific gravity and correlate this to fuel stream heating value. The result is a fast response heating value measurement that can be used to control your fired heaters even when your fuel gas composition changes significantly. These solutions allow more stable control of your heaters, more efficient energy use and lower emissions, lowering the cost of regulatory compliance.

A refinery using fuel gas with 25-50% hydrogen content was able to increase steam capacity from 80% to nearly 100% by using a control system cascade loop for fuel to air ratio on a mass basis using a Micro Motion Coriolis flowmeter. They were also able to avoid hot spots and excess NOx emissions.

Source: Expertune, Inc., *How to Improve Performance of Process Control Assets*, 2011.

MINIMIZE LOSSES

Loss cannot be measured directly, but is calculated from inputs, outputs, inventory, and fuel quantities. Therefore, identifying and reducing loss in your refinery depends on accurate flow measurements. Measurement inaccuracies stem from errors in level measurement in tanks, and temperature, density, viscosity, and water content errors in volumetric measurement.
Micro Motion flow and density meters are immune to changing process conditions, eliminating apparent losses due to measurement uncertainty. This leaves you with real losses that you can address and minimize.

REDUCE MAINTENANCE-DRIVEN DOWNTIME

Asset downtime costs the refinery time and money, even if it is planned. Preventative maintenance is designed to avoid failure, but this maintenance-driven downtime can be reduced. Traditional flow measurement technologies all have inherent limitations that must be vigorously maintained to prevent equipment failure and process shutdown. This maintenance is built into your budget and operating plan, but there is another way. Micro Motion flow and density meters have no moving parts to maintain, no impulse lines to plug, and with the built-in diagnostic capabilities, you'll be able to reduce or eliminate pull and inspect events, freeing your resources for more valuable activities.

www.MicroMotion.com/Refining

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