



Improving Customers Profits through Innovation and Technology

by Jon Moreau, Director, Sales - Jiskoot Quality Systems



With the price of crude oil remaining high, many oil companies and refiners are focusing on how new technology can reduce costly measurement errors. The importance of quality as a part of the overall quantity measurement process is being put in the spotlight by rising hydrocarbon prices. 100,000 barrels of crude oil does not have the same value if it contains 1.5% water as it does if it contains 0.5% and poor 'quality' measurement that masks these figures can have a significant impact on profitability.

Many companies are now investing to improve custody transfer and quality measurement systems based upon the significant savings that can be made, even at

much lower crude prices. In a recent comparative test in the USA, the latest custody transfer sampling technology saved one refinery over \$380,000 in the first three months of deployment!

A well considered investment in improved quality measurement technology should deliver the following:

- Greater profitability.
- A rapid return on investment.
- Advanced operations audit and management tools.
- Better supplier relationships.

Saving money through improved custody transfer sampling

Measurement of water in crude oil or liquid hydrocarbons, for custody transfer or quality control, is governed by international standards. The most widely recognised standard is ISO 3171, however much of the equipment deployed in the field is now out-dated and improvements can have a significant effect on the bottom line.

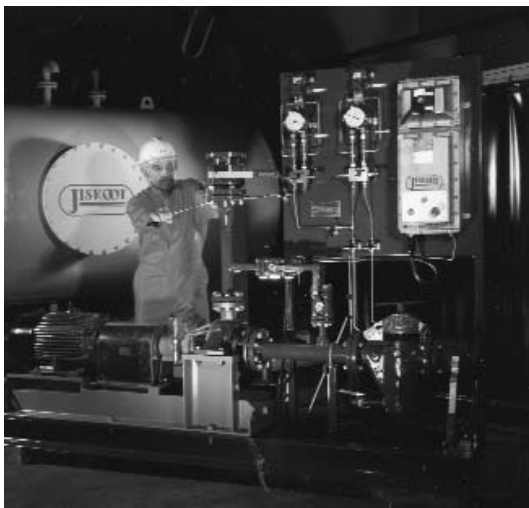
The valuation of a cargo of crude oil, which could be in excess of 250,000 tonnes, is normally based upon the laboratory analysis of a sample, which is normally only 1ml.

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This brings into sharp focus the need for accurate measurement and to minimise bias and uncertainty in the valuation process. Field data from over 200 installations worldwide shows that sampling technology has a systematic bias to under-measure water. Older equipment, such as insertion probes show the largest bias while newer technologies offer significant improvements.

The latest Co-Jetix combined mixing and sampling system uses a large-bore sampling and mixing loop to reduce the systematic bias to - 0.025% (with 0.06% uncertainty). While these numbers may seem small, they have a

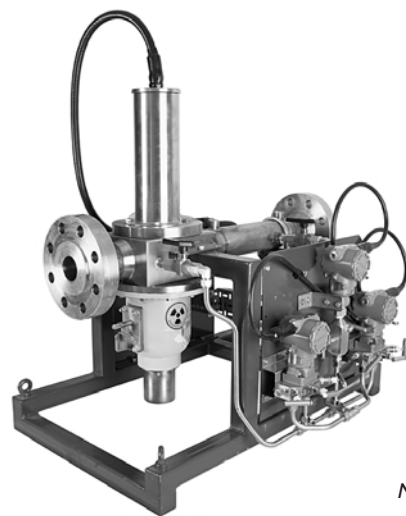


Co-Jetix sampling system

significant impact on profitability because of the large volumes of crude oil being handled. This means that selection of the right sampling technology for custody transfer can significantly reduce costs. In 100,000 bbl/d refineries Co-Jetix sampling systems have

consistently delivered return on investment in less than four months because they are no longer paying oil prices for water!

Jiskoot is the world's leading specialist in the field of custody transfer, allocation and quality sampling measurement. Over 60% of world crude oil is handled or valued on the basis of Jiskoot equipment at most of the major crude oil transit facilities throughout the world. The company is committed to the long-term improvement of custody transfer measurement through best practice and the reduction of systematic bias and uncertainties.



Mixmeter

Reducing production measurement time and costs

The fluid dynamics of multiphase flow is sufficiently complex to have an industry sector devoted to its analysis and prediction. However, the simultaneous real-time measurement of oil, water and gas offers long-term savings and this is driving investment and deployment of new multiphase metering technology.

The flow profile of multiphase flow is changeable and unpredictable and influenced by a wide range of unmeasured properties including up and downstream piping. This means that most multiphase flow meters require complex on-site calibration both when installed and regularly during their operating life.

Jiskoot manufactures a unique flow meter (Mixmeter) that is simple to calibrate, compact and isolated from the fluid dynamics that affect other devices. This means that the

meter is highly repeatable, accurate and needs significantly less initial and ongoing calibration than other technology.

Originally developed in conjunction with one of the world's leading universities, Mixmeter is the most compact multiphase meter on the market. Due to its size it offers capital savings on new-build projects in addition to the production flexibility and savings made by more regular production measurement.



Wet gas molecular sieve

Improving offshore wet gas measurement accuracy

Jiskoot's experience of single, two phase and multiphase fluid dynamics means it was ideally placed to develop technology for wet gas measurement that offers huge savings to production facilities.

Offshore gas production, often using shared platforms and flow-lines, is driving the need for new and improved measurement technology. Most gas production has entrained liquid (condensate, methanol, water etc), which causes measurement errors. These (often large) errors can be corrected using a number of defined equations provided the liquid/gas ratio can be accurately measured.

In conjunction with AMEC, Jiskoot has developed a unique wet sampling system to measure the fluid ratio. It utilises a patented design and is the most accurate measurement available for this application. In addition to providing the fluid ratio necessary for the correction of measurement errors, the sample provided by the system can be used to analyse the gas and liquid composition and provide a more accurate production valuation. The system can also be used for "production well testing" where very high gas content makes the use of a test separator impractical or not cost effective. This

innovative measurement technology allows operators to reduce their taxation liabilities and improve revenue allocation.

Optimising blended product quality

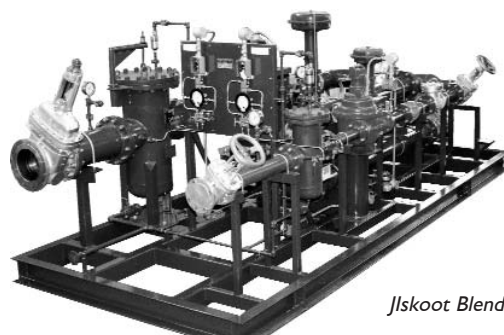
Blending a low specification fluid, with a higher specification and cost liquid to create an optimum product at the lowest cost is the basis of many oil and gas operations like crude oil and bunker fuel blending.

The accuracy of the final blended product is defined by the quality and consistency of the feedstock, the control and measurement equipment and the compatibility of those components, combined with a fundamental understanding of the blending process and control parameters. Where the feedstock to a blending process varies, the accuracy of the final batch becomes compromised. Often the only way to deliver a product that meets customer requirements is to blend an 'over-specified' product, based on the uncertainty of the feedstock quality.

Jiskoot specialises in the design, manufacture and supply of turn-key in-line blending systems that offer the optimum flexibility and return on investment through two key areas:

1. *Reduction of measurement uncertainty and improvement of control systems to guarantee product specification.*
2. *Integration of on-line analysers to provide real-time dynamic feedback to the control system to maintain the final product quality, even if the feedstock varies.*

Systems offer the optimum control and production capability and guarantee to reduce operating costs whilst maintaining product quality.



Jiskoot Blender



One recent Jiskoot customer claimed that his cost of blending a product (that sold for \$170 tonne) was reduced by as much as \$5 tonne!

World-class innovation and solutions

Jiskoot is the world's leading specialist in sampling, blending and multiphase measurement. The company is an independent organisation with offices in Houston and the UK. It has over 40 years experience of the design, supply and support of equipment for custody transfer measurement and applications with challenging fluid dynamics.

Jiskoot has strategic alliances with industrial and academic institutions and is certified to ISO 9001:2000. The company's capability and facilities enable them to accept total project management for any sampling, blending or multiphase metering application. Every Jiskoot system is synonymous with the highest accuracy and reliability, and boasts rapid return on investment and low lifecycle costs.

We have the capability to perform all design, manufacture and system testing in-house, where we custom-build systems to customers requirements.

Jiskoot is supported by an international network of over 50 local representatives who provide sales support and local maintenance and repair contracts directly to customers. The company is an approved vendor for most international and national oil companies and has alliances with major project contractors.

Jiskoot has a continued long-term commitment to develop technology that improves profitability for our customers and reduces the cost of installation, support and life-cycle cost.

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