

## Process Progress December 2011

### Where did the gain go?

In a refinery at the end of the month as the books are closed, the Refinery Manager or Finance Manager may ask the Operations or Technical Manager "Where did the gain go?" launching a search for missing oil due to a missing or incorrect tank gauge, a lost product shipment, or unrecognized loss to the flare or a product spill.

The source of the problem is usually found but after a great deal of financial, operations, and engineering time is spent. In addition to the loss of the important work they could have been doing, the incident puts doubt on the location's credibility.

Although stock balance problems have decreased with improvements in instrumentation and tank gauging systems, they persist and continue to be highly disruptive.

What can be done to avoid this?

First, recognize the business objective of the stock balance is to provide the material accounting for the financial statement. Ideally the business imperatives and tolerance for imbalance should be defined up front along with a corresponding compliance plan, staffing, and program cost. Understanding yields, gain, and performance analysis are secondary. Again, it is ideal to define the business objective, risk tolerance, compliance plan, staffing, and cost up front.

Second, the better your instrumentation systems the fewer problems you have. The tank gauging system is especially important. But, finding money to upgrade existing instrumentation is difficult. So most of the time you have to work with the instruments you have.

Third, it is important to have a good stock balancing system. Two good, market leading systems are Aspen Technology's *Advisor* and Visiant Pimsoft's *Sigmafine* (previously provided by OSIsoft).



Fourth, the information flow and work processes for collecting raw material receipts and product shipments should be reviewed. This includes consistent cut-off times for shipments, receipts and inventory measurements; adequate technology for custody transfer meters; joint witnessing of daily readings & testing of prover-loops. These can be weak links in the overall system since several different companies are involved.

Finally, monitoring of the material balances should be reviewed. Most refineries produce daily operating summaries for the refinery as a whole and for each process unit. They should be routinely monitored daily.

The most common cause of the material balance problems and are:

- bad tank gauges,
- incorrect identification of tank contents,
- lost pipeline transfer tickets,
- lost barge shipment tickets,
- a bad process unit meter (although a bad process unit meter, unless part of a custody transfer, does not actually affect the stock balance), and
- long conversion unit startups.

And, yes, occasionally there is actual loss of hydrocarbon to the flare or spills but these are usually recognized.

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## Activities, Partner and Associate News

### Stock Balancing Support

Our new Associate, Fred Salmen, has extensive experience and expertise implementing stock balancing systems and can provide assistance in improving or tuning-up your stock balancing and yield accounting system.

Although stock balancing and yield accounting have benefitted from improvements in instrumentation and new software systems, the real key to success is application of process engineering principles. Best practices have been developed to allow reductions in inaccuracies, early detection of imbalances, and systematic identification and correction of problems. Application of these practices can greatly improve utilization of valuable staff time and reduce the disruptive impact of periodic searches for losses.

C. F. Gillard and Associates are consultants to the Process Industries providing assistance in process engineering, operations management methods and systems, IT strategies and project scoping and implementation, and plant management. Several people have asked for access to previous Newsletters. They can be accessed by clicking here: [Archive](#).

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