



*We're Going Global*

## Shore Tank Loss Control

Last month, TECHTALK examined Vessel Loss Control in great detail. This month, the focus shifts to shore tank loss control and the varying contributing factors to volume discrepancies.

**Meters** - Custody transfer measurements may be carried out using meters. Some knowledge of how the various meter types operate, potential errors and the generation of the final figures will allow pertinent questions to be asked when investigating a gain or loss.

Meters may be incorrectly installed, maintained, operated or have errors due to wear and tear of components. Points of consideration include the following:

- a) Meter proving frequency (this should be in accordance with manufacturer's recommendations, company or national legislation.
- b) Maintenance records.
- c) Control charts.
- d) Meter factor or K factor on the custody transfer document compared to the most recent prover record.
- e) Prover calibration records.
- f) Possible application of incorrect (out of limit or out of date) meter factors.

The terminal should be able to provide meter factor control charts and the last prover calibration report with traceability to national / international standards. If possible, metered volume should be compared with shore tank volumes.

*NOTE: Custody transfer meters should be properly proven, certified and operated to a recognized industry standard. If any of the meter data cannot be obtained, the metered volume may be questionable.*

**Shore Tank Measurements** – Tank calibration tables should comply with recognized industry standards. The date of the most recent calibration should be noted and confirmed. When addressing suspected problems with shore tank measurements, the following issues should be considered:

- a) Differences between manual and automatic gauge (ATG) measurements.
- b) Tanks may move or deform over time causing reference points to distort and capacity tables to become inaccurate.
- c) Inadequate settling time before gauging may result in inaccurate liquid measurements, particularly with regards to water determination.
- d) Tank bottom flexing may affect measurements especially if the tank level has changed considerably during the product movement.
- e) Temperature or density (degree API gravity) stratification may have an effect on floating roof correction calculation.

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- f) Valve leakage.
- g) Product density / API gravity may be incorrect. A comparison should be made with density / API gravity at other measurement points.
- h) The observed reference height should have been measured and may not be the same as stated on the tank capacity table. However, the difference between the two should be minimal. Any significant differences should be investigated and may be due to distortion or a buildup of sediment.
- i) The datum plate height above the tank bottom may not allow for identification and quantification of material below the datum plate.
- j) Unslotted standpipes may have been used for measurements.
- k) Sediment buildup in the tank or standpipe may affect free water determination, measurement accuracy, and / or tank critical zone positions. Also, the presence of sediment on the tank bottom may complicate free water determination as the horizontal water / oil interface may not extend across the whole tank.
- l) Tank shell thermal expansion corrections may not have been correctly applied.

In addition, terminal balance and stock records may be needed to investigate any potential cargo diversions.

**Floating Roof Tanks** – If the shore tanks have floating roof tanks it is important to verify that the roofs were not in the critical zone at the start or finish of the product movement. Measurements taken in the critical zone should be avoided. As mentioned in a TechTalk #006, the critical zone is when tank roof is about to come out of floatation and is neither resting totally on its supports nor freely floating. It is essential that opening and closing measurements should be taken with the roof floating freely or with the roof resting on its legs. Tank capacity tables should show the levels at which the roof is fully grounded or floating. Tanks may be calibrated for both high and low leg positions and it is of utmost importance correct tables were used to obtain volumes.

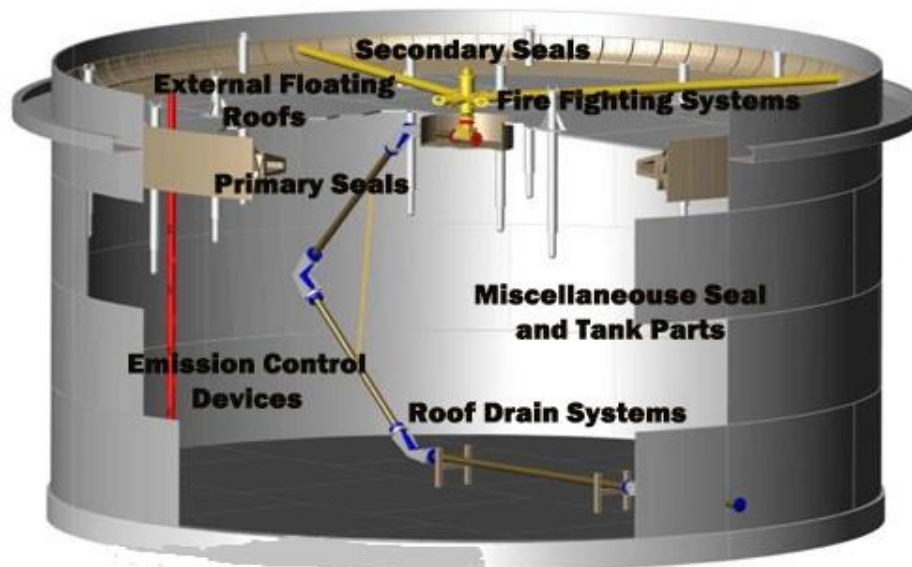


Figure #1 Source <http://www.hmttank.com/Products.htm>

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Issues encountered when gauging a floating roof tank are as follows:

- a) When a measurement is made and the roof is thought to be floating but is not then an incorrect quantity will be measured.
- b) In older tanks, sediment buildup can extend the critical zone.
- c) Movement of the floating roof due to windy conditions.
- d) Change in tank roof orientation, i.e. tilting, sinking, etc...
- e) A change in the weight of the floating roof, i.e.... rainwater, snow, product on roof.
- f) Roof leg position at time of measurement should be verified.

**Line Verification** – The fill condition of the shorelines before and after the product movement should be correctly determined and documented. Slack lines can result in a discrepancy in the bill of lading or the outturn quantities. The fill condition of the vessel lines after loading and discharge should also be documented to determine there is no unmeasured cargo on the vessel.

**AmSpec inspectors are trained to detect all scenarios listed in this document and are ready to serve you to account for all barrels from load to discharge.**

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