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Reconciliation of Liquid Pipeline Quantities

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Introduction

In the ideal world, every drop of liquid received into a pipeline system and every drop delivered out of the system, as well as all liquid inventory within the system, would be measured and accounted for precisely, and a comparison of all receipts and all deliveries—adjusted for inventory changes—would be exactly the same. The system would never experience a loss or a gain. Unfortunately, this ideal pipeline balance seldom exists in the real world.

Most pipeline systems typically experience some degree of loss or gain over time. This represents the normal loss/gain (L/G) performance for a system. From time to time, losses or gains greater than normal may occur for a variety of reasons. Excessive or unexplained loss/gain often leads to contention between participating parties, sometimes requiring monetary settlements to adjust for abnormal loss/gain.

Reconciliation of Liquid Pipeline Quantities

1 Scope

1.1 General

This chapter provides methodologies for monitoring liquid hydrocarbon pipeline loss/gain (L/G) and for determining the normal loss/gain performance level range for such pipeline system.

This document does not establish industry standards for loss/gain performance level range because each system has its own characteristics and exhibits its own loss/gain level range and/or patterns.

This document also provides operational and statistically based tools for identifying when a system has deviated from normal, the magnitude of the deviation, and guidelines for identifying the causes of those variations. Troubleshooting suggestions are also presented.

1.2 Field of Application

The primary application of this publication is in custody transfer liquid pipeline systems in which there is provision for measuring all liquids that enter the system and exit the system, as well as liquid inventory within the system. The application is not intended for nonliquid or mixed-phase systems.

The applications and examples in this document are intended primarily for custody transfer pipeline systems, but the principles may be applied to any system that involves the measurement of liquids into and out of the system and possibly, inventory of liquids within the system. Such systems may include pipelines, marine terminals, marine voyages, bulk loading or storage terminals, tank farms, and rail and trucking systems.

2 Normative References

There are no normative references in this document.

3 Terms, Definitions, Acronyms, and Abbreviations

3.1 Tems and Definitions

For the purposes of this document, these terms and definitions apply.

3.1.1
control chart
A graphical method for evaluating whether a process is in or out of a state of statistical control by using warning and action limits determined by statistical analysis of the process data.

3.1.2
control limits
Lines on a control chart used to evaluate whether or not a process is in statistical control.

3.1.3
line fill
Quantities of liquid contained in a segment of pipeline.

3.1.4
loss/gain system
L/G
L/G is the difference between deliveries and receipts, adjusted for changes in inventory, experienced by a system over a given time period (e.g., day, week, month) or over a single (or multiple) product movement(s).