Topic ID	**OEA73T**
Title	**How to Implement a Blending Control and Optimization Project**
Category	**M-Manage Infrastructure**
eLearning Level	**Basic**

Introduction

A refinery uses a specific number of tanks. To maximize the usage and value of these tanks, the refinery improves its operational flexibility through tank farm automation and automatic gauging systems. This allows a refinery to function efficiently despite operational and process constraints like feed quality, stock availability, etc.

This topic will discuss the role of a tank, tank inventory, tank process parameters, the automatic tank gauging system (ATG), level sensing technologies, float and displacer type gauges, reflection of a wave from the surface, hydrostatic pressure gauges, cylindrical tank anatomy and conventions

It will also discuss tank volume calculations from tank geometry, strapping factors, tables, temperature stratification, temperature measurement, density measurement, pressure/interface measurement and alarms, comparative accuracy, interfaces, etc.

Tank Farms & Automatic Tank Gauging Systems

The selection of a tank farm's appropriate build and material depends on the fuel to be stored and its compliance with laws and standards. First, the tank quantification procedure is done by an operator using manually observed measurements and referring them to ASTM tables. Next, tank inventory is assessed by using and maintaining automatic tank gauging (ATG). Here, calibration is done to ensure reliable results.

Strapping tables are prepared by conducting tank strapping measurements. They include tank shape, roof, wall roundness, and floor profiles. There are different methods of automatic tank gauging as described in engineering standards. The most common one is the Manual of Petroleum Measurement Standards (MPMS) by the American Petroleum Institute (API). For the integration of tank information systems (TIS), real-time database applications are used. They provide quality tank information for the calculations and alarms necessary for effective automation.

Level sensing methods have developed gradually from manual gauging to the latest non-contacting gauges. For manual gauging, meters, sticks, and eyes are used. Different gauging methods and instrumentation may be evaluated by considering their relevance to purpose, material, accuracy level, maintenance, installation process, mean time between failures (MTBF), compatibility to an automation system, and cost. Temperature measurement and thermal stratification play significant roles in the accuracy of automated tank gauging.

The hybrid tank gauging system is used by combining ATG and hydrostatic tank gauging. It is used when a refinery requires mass and/or density data. In addition, computational fluid dynamics and/or wind tunnel testing are used to determine the influence of wind load on fuel tanks.

Summary

This topic discusses how to increase the operational flexibility of a refinery through tank farm automation. In a refinery, tank farm risk "hotspots" are identified.

Options for eLearning this topic

Mode of eLearning	Available?
Free Course	No
Refresher Course	Yes
Pick N Choose (Custom Curriculum)	Yes
Advanced Level Course	Yes
Structured MCOR Curriculum	Yes