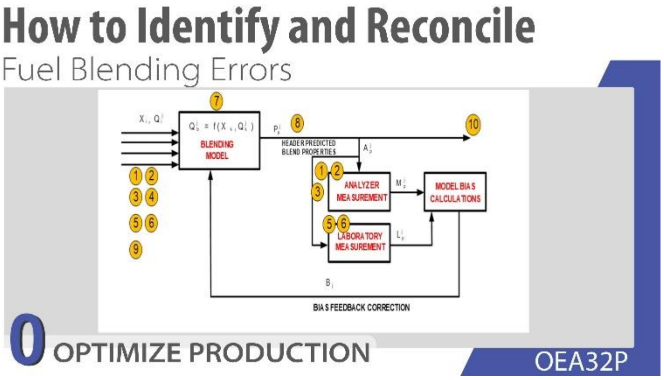
OMS eLearning Academy
For Refinery Offsite Operations Professionals



Topic ID	**OEA32T**
Title	**How to Identify and Reconcile Fuel Blending Errors**
Category	**O-Optimize Production**
eLearning Level	**Basic**

Introduction

Blending methods inherit multiple sources of error during operation. These mainly are in flow calculations, blending models, values, analyzers, lab testing, and forecasts. Optimization and reconciliation of blend model parameters must be carried out to maximize profitability.

This topic will discuss how to identify and estimate blending errors, error minimization, reconciliation and feedback, criticalities, sources of errors, blending goals, blending infrastructure and process, etc.

Identification and Rectification of Model Errors

Most inaccuracies arise from the use of online analyzers for quality checks of component streams and blend headers. Transport lag, dead-time lag, and dynamic lag in the analyzer accounts for radical errors. Also, inaccuracies in quality correlation and blending process as well as human and flow measurement errors are common causes of inaccuracies.

Identification of these errors is carried out through feeding these calculated errors into a blending model. It comprises a set of mathematical equations followed by analyzer measurements and laboratory measurements. Feedback correction from model bias calculations is then fed back into the primary blending model.

Correction in flow measurement is defined by an equation where corrected flow is the sum of raw flow, zero offset (value of raw flow at zero output), and calibration correction constant.

Analyzer error is the combined result of transport lag and dynamic lag. Analyzer error is measured as the difference between actual quality value and achieved steady state value. Common causes of these lags include calibration out, frozen signals, out-of-limit signal, violation of rate of change, bias limits, and downtime for repair. The online storage of lab analysis values and statistical history of analyzer biases plus the use of an analyzer to check algorithms can help in minimizing these errors.

In linear blend models, component qualities are blended by their indexed values. In nonlinear models, they are blended by their native values, a nonlinear interaction term, and a bias term. Two-step nonlinear regression methodologies can give the best possible values by successive substitution of parameters for each optimization step. Effective automation of blending infrastructure, installment of systems to measure real-time stream qualities, and use of nonlinear blend models to minimize errors are of key importance.

Summary

Fuel must be optimized by maximum use of cheaper components in order to make refineries profitable. The trim blend may use components at the end of blending process to adjust octane and RVP. Re-blends are carried out to the correct specifications of fuel for quality control. Both result in huge cost for a refinery. Thus, minimizing inaccuracies and errors during the blend process is important. It helps to avoid trim blends and re-blends.

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