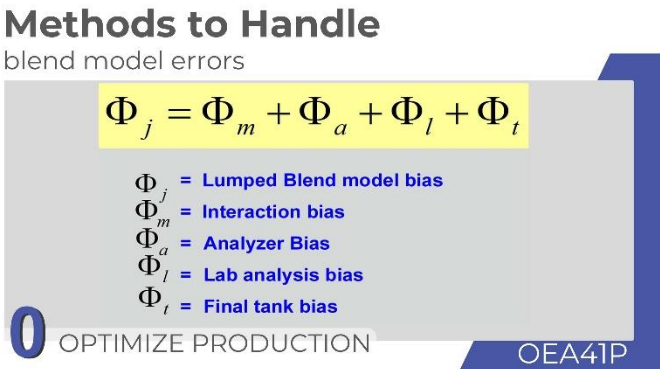
OMS eLearning Academy
For Refinery Offsite Operations Professionals



Topic ID	**OEA41T**
Title	**Methods to Handle blend model errors**
Category	**O-Optimize Production**
eLearning Level	**Basic**

Introduction

Linear and nonlinear data normalization, or reconciliation, entails a linear system and a nonlinear system with mass and energy scales and constraints. Therefore, a significant sum of work is required to devise a solution strategy or develop a model for nonlinear data reconciliation, as it is more complex. On the other hand, nonlinear blend models are closer to reality.

This topic will discuss the use of blend model bias, examples of bias for blend grades, the use of linear blending model with nonlinear blending values, the lumped parameter blending model, analyzer dynamics, methods to handle blend nonlinearity,

The topic will also discuss the use of interaction coefficients (DuPont or ethyl), nonlinear blending indexes, sources of errors in blending operations, lumped bias contributions, flow correction methods, tank prediction bias, etc.

Methods to Manage Blend Nonlinearity

For unknown nonlinearity and interaction, additional corrections are done by combining biased correction with other methods and blending models, including the use of interaction coefficient (DuPont or ethyl), nonlinear blending indexes, or a combination of these methods. Biased correction is done for blend errors based on the blended product and its recipe. It is not constant, but its implementation is easy. It requires a database under diverse conditions. An overall biased correction for the blended model comprises lab analysis bias, analyzer bias, blend model bias, and final tank bias. Statistically averaged bias is used for these stated biases.

In refineries, sources of possible errors during blend operations may include flow measurement errors, transport and dead time lag in the analyzer measurement, lag in the analyzer that measures the dynamic response.

The errors also include human error factors during a lab analysis, a measure of qualities by online analyzers for component streams and blend header, and inaccuracies in blending method and qualities correlation.

To identify all errors, crucial parameters of the lumped blend model include blend index, blending factor, biased blend and predicted unbiased blend qualities, etc. The flow correction method is used to accomplish correction in flows because the flow measurement of blending streams is as important as their qualities. Corrected flow is the sum of raw flow, zero offsets (at zero output), and calibration correction. In short, to minimize blend prediction errors, all model bias parameters can be estimated systematically.

Summary

This topic walks through the methods to manage blend nonlinearity in refineries, all blend errors, predictions, and corrections by lumped blend model. The blend models are customized by a biased correction to avoid the compromised blend quality due to errors in blending operations.

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