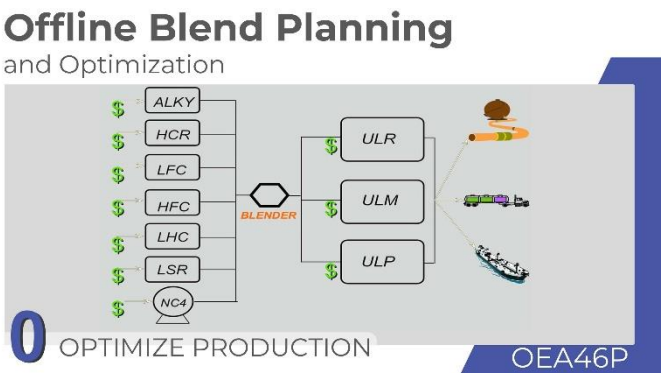

Topic ID	**OEA46T**
Title	**Offline Blend Planning and Optimization**
Category	**O-Optimize Production**
eLearning Level	**Basic**

Introduction

Enterprise-wide blend planning is useful in the optimization process of refinery operations. This type of planning requires integrated scheduling and planning to minimize the gap between the operations required for production scheduling and raw material procurement. Therefore, blending optimization is subject to many constraints. These model constraints are operational constraints – meaning limits of the equipment used, availability constraints – involves the limits on volume, and quality constraints – includes analyzer limits.

This topic will discuss the blend planning process, gasoline blending, model constraints, optimization options, heel tracking, quality correlations, optimization algorithm, multi-product / multi-period planning.

Additionally, concepts of rollover planning, interfaces with other systems, enterprise-wide blend planning, blend short-term planning process, etc. ara also discussed.

Gasoline Blending

Construction of fixed structure using the blending mechanism is facilitated by a first-principle gasoline blending model that predicts the octane number. Experimental data is used to estimate parameters. The predictive model uses regression analysis to predict the octane number of a product. Here, there is no fixed model structure.

Multi-Product, Multi-Period Planning

This process involves providing the product to multiple markets from a single stock. This also involves the calculation of composition and properties. In addition, it facilitates the estimation of the average qualities needed for a set of blends.

Available Optimization Algorithms

There are many algorithms available. For example, MINOS, CONCOPT, DICOPT, CPLEX, LAMPS, OSL, etc.

Optimization Options

A proposed optimization approach involves the solving of sub-problems independently. This is how each problem is solved at an optimal level. However, when their results are combined, they produce an inferior solution. For example, the formulated hierarchy removes the blending process from the rest of the section. This is done for localized optimization in the blending process. Another optimization option involves the use of secondary process units that can provide better quality and flow.

Property Correlations

Several characteristics help in determining the quality of the product. These properties are flashpoints, viscosity, distillation points, Reid vapor pressure, the octane number, etc. But after the blending process, these properties are hard to predict and require more complex models.

Summary

Offline/manual blending helps to avoid re-blending and loss due to giveaways. In addition, no large investment is required for the equipment in this process. Another benefit is the short payback period. It is just 1 -2 months, even for semi-automated refineries.

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

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