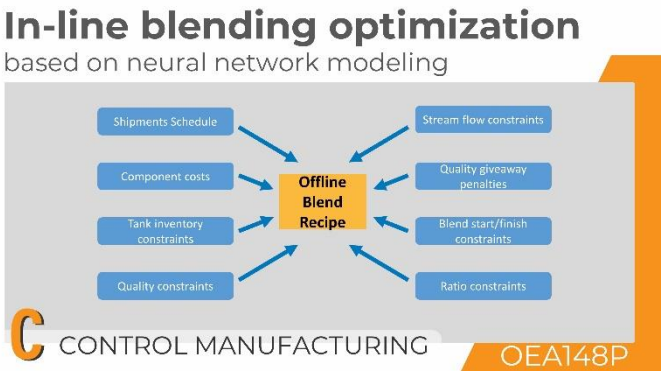
OMS eLearning Academy
For Refinery Offsite Operations Professionals



Topic ID	**OEA148T**
Title	**In-line blending optimization based on neural network modeling**
Category	**C-Control Manufacturing**
eLearning Level	**Basic**

Introduction

This topic discusses the neural network modeling method for the in-line blending optimization for crude and fuel blending systems.

This topic will discuss crude versus fuel products blending and blending properties and compare batch from tanks versus rundown blending directly from the process units.

Crude and Product Blending Systems

Crude oil blending aims to get the crude for the crude unit and second product blending to obtain the final fuel products most cost-effectively. In addition, crude blending allows refineries to use opportunity crudes.

These are cheap sources of crude oil, the properties of which are not admissible for the Crude Distillation Units (CDU) of the refinery. However, by mixing these crudes with others, the refinery's CDU can process the resulting mix.

Optimal recipes for mixing intermediate refinery products require consideration of multiple factors, considering the constraints on the properties of the blends and the capacity limitations of the refinery infrastructure.

Artificial Neural Network (ANN)

In mixing the intermediate refining products, some dependencies between the properties of the blending components and their product are linear, while the rest are non-linear.

Therefore, an Artificial Neural Network (ANN)

serves as an effective tool to model the non-linear properties of the blend products.

How is ANN implemented?

The predictive blend model based on ANN can solve the optimization problem for two principal gasoline blending cases.

The first is mixing the intermediate distillation products stored in tanks. The other is directly mixing rundown streams from the refinery's process units.

The second case is more challenging as it requires handling more real-time adaptations as the streams from the units may vary in time.

Summary

The research shows clear economic benefits of using blend optimization technology.

We must note that the ability to adapt the recipe in real-time depends on the storage tanks' qualities and the blended product's final qualities.

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