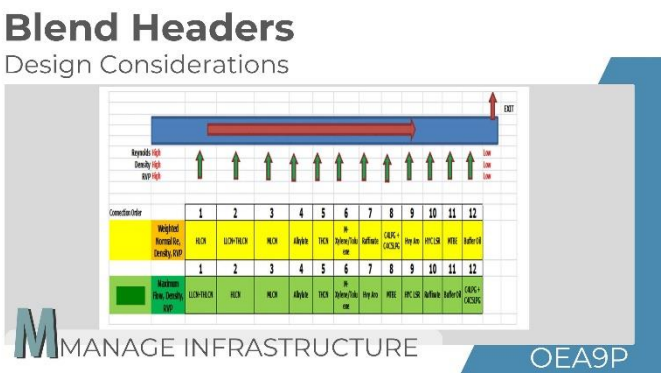

Topic ID	**OEA9T**
Title	**Blend Header Design Considerations**
Category	**M-Manage Infrastructure**
eLearning Level	**Basic**

Introduction

The blend header is a common point where the components of a blending system flow concurrently. In other words, passages of various blending components are connected to the main channel along its length, the endpoint known as a blend header.

The final product flows from one end of the pipe to the other end and then flows to a product tank. The efficient blending system involves automating field equipment, online analyzers, computer software and hardware, interfaces, and distributed control systems (DCS).

The prime objective of this topic is to outline the blend header design parameters that are indispensable to consider while designing it.

Design Parameters

The first essential design parameters are the physical dimensions of the blend header. These dimensions include the length and diameter of the blend header, which are calculated based on the distance of the components' pipeline and the blend rate range. Since the header dimensions are interconnected with the type of flow, you can determine the optimal dimensions of the header by considering a fully turbulent flow. The blended rate generally varies from 5000 to 12000 bbls/hr.

The flow regime of the components entering and flowing through the outlet of the header is determined by the Reynolds number (Re); thus, it helps to find out whether the flow is laminar or turbulent. Typically, the recommended Reynolds number is higher than 4000 for the flow inside the blend header.

Therefore, the Reynolds number is represented as follows:

$$\text{Re}=\frac{\rho VD}{\mu}=\frac{VD}{\nu}=\frac{QD}{\nu A}$$

Where:

μ = dynamic viscosity of the fluid

ν = kinematic viscosity

ρ = density of the fluid

V = mean velocity of the fluid

Q = volumetric flow rate

A = pipe inner cross-sectional area

Another crucial parameter is the pressure at the inlet and outlet of the blend header. In those designs where the booster pump is not used, the outlet pressure of the blend header ought to be more than the static head of the tank. All pressure losses are considered while designing, such as losses due to pipe elevations, pipelines, control valves, and strainers.

It is essential to consider the mixing pattern and connection order of different blending components. Each component has distinguishing properties for proper mixing with another component, such as Reid vapor pressure (RVP), flow rate regime, and density.

Summary

This topic has highlighted a few key design parameters of the blend header: header dimensions, outlet/inlet pressures, the importance of proper mixing, and the connection order.

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