Question 28: What are your best practices around initial crude oil qualifications? Upon receipt, what are your best practices for continuous inspection/receiving crude oil at a plant?

BILL CATES (Hunt Refining)

At our facility, we utilize a combined effort from three separate groups to locate, evaluate, purchase and deliver a crude to the refinery.

The first group is the crude purchasing group which is constantly looking for potential crude oils that we can process.

Once they have located these crudes, our economic/planning group will utilize the assay of the crude to evaluate this crude using our linear program (LP). This will generate the possible net back for processing the crude.

In a parallel path, a committee of technical and operations personnel will evaluate how the crude will impact actual operations and equipment. This group will look at many factors which include total acid number (TAN), nitrogen content, hydrogen sulfide (H2S) content, and potential compatibility issues. A matrix was developed for the crude blend crossing unit battery limits. The potential crudes are evaluated as to their fit within the matrix.

The final group that factors into the crude oil system is the logistics group. This group facilitates the delivery of the crude and the blending to the degree possible for the crude coming to our crude unit. Crude is delivered by pipeline, barge and rail at our facility. The pipeline predominantly supplies the Crude Unit while the barge and rail crudes are used predominantly at our Delayed Coker.

Once the crude arrives at the refinery, a sample is pulled and compared against the projected quality using quick lab analysis tests such as gravity, BS&W, TAN and nitrogen content. Variations against expected values are investigated to determine the reason for the variances. In some cases, additional sampling is done at contract lab for more detailed analysis of the crude. The result from this testing is relayed back to the crude purchasing group for working with the supplier to resolve issues.

PHILIP THORNTHWAITE (NALCO)

During the discussions around initial crude oil qualification, information should be gathered on the crude in question acquiring knowledge on its potential to present processing issues and / or cause process upsets. This information is not available on crude assays, so it is important to discuss the processing of new crudes internally within the refining organization and to gain knowledge from chemical service companies on their experience with the crude in question.

Gathering as much information upfront allows the refiner to make informed decisions regarding potential opportunity it presents versus the risk involved. By being informed and prepared, the refiner is better

placed to mitigate processing threats rather than watching them happen as the new crude is introduced or understand their cause and impact later after the event.

Additionally, the incorporation of online analyzers that constantly monitor key control parameters around the crude unit provides a statistically significant increase in the volume of data, giving the refiner greater clarity we have as to what been truly happening and providing actionable intelligence to then begin putting corrective measures in place before a significant event can escalate.

Essentially, gathering as much information up-front on a new crude combined with gathering an increased volume of good data allows us to make smart, informed decisions that will enable the selection of higher margin crude with more certainty of a successful outcome.

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