

Transcend IDEA™ Update – Solids from Hydrocarbons

Good design makes all the difference

PROJECT BACKGROUND

High Solid Particulates: Naphtha Reformer catalyst support plate broke loose allowing 30,000 lb. of catalyst to contaminate the naphtha.

Poor Fluid Quality: With 30,000 lb. of catalyst in the system, the refinery was unable to meet custody transfer specifications.

Inefficient Separations: The refinery installed a rental system to clean the reformat product. During the three months of using this system the refinery:

- (a) was never able to pass the custody transfer specifications,
- (b) experienced daily element changeouts, and
- (c) encountered high operating costs – over \$50,000 per month.

PROCESS CONDITIONS

- Unit: CRU- Naphtha Stream
- Design: 45,000 BPD
- Operating: 35,000 – 45,000 BPD
- Temperature: 80°F

CONVENTIONAL SEPARATOR

High Media Velocity: The original rental system comprised a 30" OD vessel, with 10 elements. The media velocity was high.

Element Configuration: The elements flowed inside-to-out which reduces their capacity.

Media: The media used for the separation did not provide the efficiency or capacity required.

Efficiency: Inlet concentration was 4.1 mg/L with effluent at 3.1 mg/L, for only ~30% removal.

ROOT CAUSE APPROACH

- **Custom Solution.** A strong understanding of fluid properties and their impact on element contaminant capture and capture capacity, allows Transcend to develop targeted solutions.
- **Preferred Flow Configuration:** The outside-in configuration maximizes element capture in a given vessel diameter.
- **Higher Efficiency:** Based on Transcend IDEA Labs' analytical work, Transcend had a clear understanding of the media technology required to effectively remove the offending contamination.
- **Lower Media Velocity:** By improving media velocity, greater contaminant capture was possible, thereby allowing longer online life despite higher removal efficiencies.

SOLUTION

- Optimized design. Media velocity reduced by over 50%.
- 36" OD separator.
- Thirty-three (33) Endur Tetra™ elements.
- Outside-to-in element flow configuration to maximize dirt capture per element.
- Coreless element, using semi-permanent cores within the vessel to reduce disposal volume.
- Fluid compatible O-ring seals to provide positive seals.
- Fluid compatible adhesives to prevent degradation in service.
- Spatially fixed pore structure of media to maintain fluid quality even at high differential pressure.

RESULTS

From initial startup the refinery experienced significant improvements.

- **Extended Run Life:** Transcend elements achieved a run life of over 1 month.
- **Improved Fluid Quality:** The refinery was now able to pass custody transfer. Effluent below detection limit of 0.2 mg/L.
- **Reduced operating Cost:** The refinery realized over 60% operating savings, equivalent to over \$30,000 per month.