



Total Refinery Protection

Gulf Coast Refinery, USA

Problem

Crude oil received by barge and pipeline is highly contaminated with black powder contamination. It enters the crude unit and causes (1) increased energy use to heat the crude feedstock, (2) lower product recovery efficiency, (3) trays to fill up, plug off and collapse, (4) more frequent and intensive turnarounds (TARs), which take longer to complete, and (5) contamination to move further into refinery process equipment.

Solution

Initially deploy BPS magnetic separator systems on all major pumps downstream of the atmospheric distillation column to remove contamination and lower energy use, prevent unscheduled downtime and facility upsets, extend the TAR cycle and improve product quality.

Results

The crude unit and overall facility is running much more efficiently with minimal downtime with BPS magnetic separators in place. As of June, 2019, there are BPS magnetic separators on the desalter process water, on the pumps identified in the table below and the refiner is looking at additional deployments on pumps and in the crude feedstock.

Refinery Magnetic Separator System Deployment			
Pump 102	Crude Reflux Pump	660 gpm	245° F
Pump 104	Kerosene Product Pump Around Unit	300 gpm	450° F
Pump 105	Distillate Product (Diesel) Pump	150 gpm	550° F
Pump 107	Distillate Product Pump Around Unit	1200 gpm	550° F
Pump 108	Kerosene Product Pump Around Unit	1200 gpm	450° F
Pump 110	Crude Reflux Pump	260 gpm	145° F
Pump 111	Crude Column Overhead Water Drum Pumps	15 gpm	140° F
Pump 115	LPG Product Pump	6 gpm	120° F

Pump 108 Kerosene



Crude oil in the refinery feedstock, loaded with black powder contamination.

Pump 107 Diesel Fuel



Contamination collected from finished distillate product: diesel fuel and kerosene, after 6 weeks of operation. The magnetic separator systems cleaned the product to the standard that it did not require clay-filter color removal.