



PROJECT REPORT

PR1550/93

HiTRAN[®] Thermal Systems Technology

PROVIDES COMPACT, MAINTENANCE-FREE HCGO COOLING IN CATALYTIC-CRACKING OPERATIONS AT IMPERIAL OIL

PLANT

Refinery, Ontario, Canada

SERVICE

HCGO Cooler

EXCHANGER

TEMA type BEM, 1 tube pass
371 tubes: 25.4 x 2.03 x 6096
(1in. x 14 bwg x 20ft.)



PROBLEM

The cooling of viscous heavy cycle gas oil, arising as a fractionation product from cracking operations, suffers from poor heat transfer and is prone to sticky deposits forming on cooled heat transfer surfaces. It would also be difficult to control fin-fan air coolers across the variable ambient air conditions prevailing at the Client's Canadian site location. Instead of accepting inadequate performance from an unnecessarily large heat exchanger, Imperial Oil consulted Cal Gavin to provide an economic and more effective solution.

SOLUTION

Following a study of both air-cooled and shell and tube heat exchanger designs, Cal Gavin determined that the necessary temperature control would more readily be achieved in the shell and tube arrangement. Also, by removing the stagnant boundary layer, a HiTRAN Thermal System would overcome the laminar flow limitations imposed by the viscous HCGO, and precise control of tube wall temperature would maintain the fluid above the solidification point of its heaviest components.

BENEFIT

80% reduction in surface area and 55% diameter reduction compared to the plain tube equivalent. Duty achieved in one-eighth flow length with film temperature controlled at all points. Maintenance-free since its commissioning, sticky deposits are a thing of the past.

INSTALLATION

February 1993

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