

PROJECT REPORT

PR1006/86

HiTRAN[®] Thermal Systems Technology

CUTS COST OF CAPACITY UP-RATE AT ICI BY INCREASING THERMAL EFFICIENCY AND REDUCING ENERGY USAGE

PLANT

Petrochemicals, Wilton, UK.

SERVICE

Feed vapouriser/reactor effluent interchanger.

EXCHANGER

Fixed tubesheet, TEMA type
BEM. 1342 tubes: 25.4 x 2.03 x 3658
(1in. x 14swg x 20ft.)



PROBLEM

Plant capacity was limited by the feed vapouriser train performance. With a high shellside boiling coefficient, tubeside heat transfer limited overall performance. It was possible to install more tubes, but the poorer coefficient resulting from lower velocity, diminished the benefit. Other conventional improvement strategies were considered to be similarly ineffective. ICI also had concerns about the effect of fouling, which was known to occur in the bottom 10% of the tubes.

SOLUTION

In partnership, Cal Gavin and ICI, conducted a thermal test programme from which the in-service enhancement could be predicted with certainty. In parallel, mechanical trials proved that even under severe adhesive fouling conditions, the HiTRAN Matrix Elements would be removable. The trials confirmed that 100% improvement in tubeside heat transfer rate could be achieved, and engineered within the allowable pressure drop. A HiTRAN Thermal System was consequently retrofitted to each pair of vapourisers.

BENEFIT

Careful performance monitoring quickly showed that the vapourisers were operating with an overall heat transfer rate of more than twice that in the original units. Furthermore, after years in service, only minimal evidence of fouling was observed even where the heaviest of fouling had previously been experienced. Indeed, such was the success of the application that HiTRAN Thermal Systems were employed to maximise the performance of new vapourisers in subsequent plant upgrades.

INSTALLATION

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* Full Technical Paper Available *

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