

SPLIT FLOW TECHNOLOGY

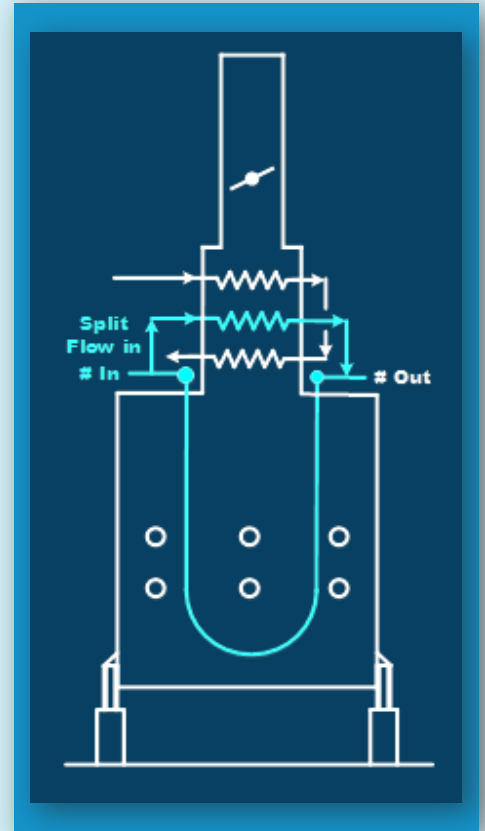
Low Cost Solution for Capacity Improvement & Efficiency Improvements.

When refiners wish to increase the capacity of their existing fired heaters, “Split Flow” aims to improve the utilization of thermal energy for process heating. In split flow technology FIS has developed a new approach to increase the capacity of fired heaters without increasing the process side pressure drop. This is achieved by splitting the process fluid into two parallel streams. For the heater under consideration the split flow is perceived to work as described below:

Main Stream – The fluid in the first stream is heated in the radiant section.

Split Stream – The fluid in the second stream will pass through the convection section and is heated predominantly by the convective heat transfer mechanism. The two streams are combined at the heater outlet.

This technology has been very successful for capacity increase revamps in many Heaters. It is extremely efficient and a low-cost process. The capacity increase is in the range of 15-30%.



ADVANTAGES

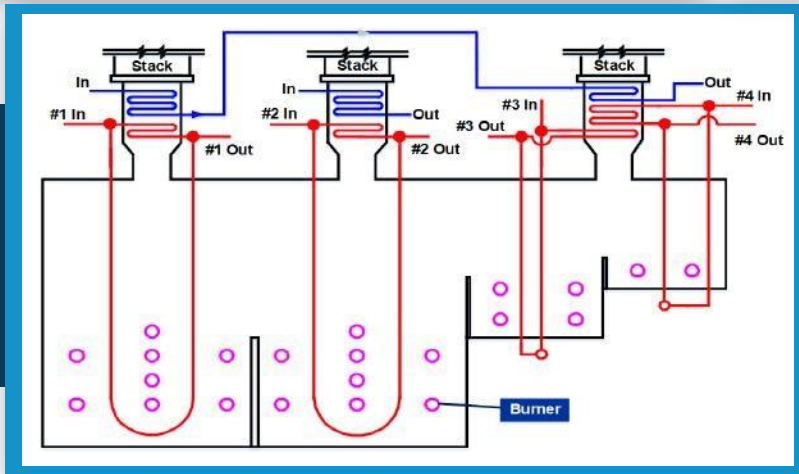
- ✓ Higher Capacity
- ✓ Lower Firing Rate
- ✓ Longer Tube Life
- ✓ Lower TMT
- ✓ Lower Pressure Drop
- ✓ Higher Efficiency
- ✓ Lower Firebox Temperatures
- ✓ Lower Radiant Heat Fluxes

Case Study: Capacity Improvement of No.4 Platformer

The four-cell Reformer Heater was originally designed for a heat duty of 181.32 MMBtu/hr in 1970. The heater was operating at 67% thermal efficiency. Client wanted to increase the capacity and improve the efficiency of this heater but didn't want an air preheater system and neither generates steam.

FIS was contacted by the refinery to develop an economical scheme for improving efficiency. FIS redesigned the heater with our "Split Flow Technology" scheme. In this scheme, the feed is heated parallel in the convection and radiant sections. This design works very well to increase capacity and minimizing the pressure drop during the process. FIS carried out the entire scope of activities from conceptualization to commissioning of this heater revamp.

The heater was successfully commissioned in October 2002. After revamp, the capacity of this heater was improved from 18,000 BPD to 26,000 BPD. The Scheme was nearly half the cost of conventional revamp. The client is very pleased with the heater performance. The heater has been running successfully since 2002.



Reformer Heater Data Comparison

Parameter	Unit	Before Revamp	After Revamp
Capacity	BPD	18,000	26,000
Heat Release	MMBtu/Hr	234	225
Stack Temperature	°F	1,092	478
Fuel Consumption	MSCFH	244	242.8
Fuel Savings	\$/annum	5.8 Million (Based On \$6 /MMBtu)	

Furnace Improvements Services

Uniform Heat Transfer in Fired Heaters

Furnace Improvements Services

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