



**PROJECT REPORT (PR-013):  
XYLENE SPLITTER REVAMP WITH AMT'S ADV PINNACLE PERFORMANCE TRAYS**

Customer: Major Petrochemical Company

Project: Xylene Splitter Revamp

Date of Revamp: 1998

**BACKGROUND**

There are two Xylene Splitters, each with two towers in series and a total of 150 trays. The No. 1 Xylene Splitter (4.9 meter I.D.) has 31 two-pass trays and 119 four-pass trays in the rectifying and stripping sections, respectively. The No. 2 Xylene Splitter (7.5 meter I.D.) is basically scaled up from the No. 1 Xylene Splitter, with the exception that four-pass trays are used throughout two columns.

**REVAMP OBJECTIVES**

The objectives of this revamp were to:

1. Increase Xylene Splitter throughput by 20%;
2. Improve Xylene Splitter tray efficiency to 80% minimum; and to
3. Allow the unit to operate at two modes, i.e.,
  - Mode 1: Max. P/M-Xylene production
  - Mode 2: Max. O-Xylene production

**COLUMN PERFORMANCE**

Before Revamp

While the No. 1 Xylene Splitter has an observed tray efficiency of 80% throughout two columns, poor efficiency was observed in the No. 2 Xylene Splitter. This low tray efficiency resulted in

excessive energy consumption and limited further reflux and/or throughput increase.

After Revamp

The scope of mass transfer internal modifications for the revamp includes:

- Replacing all (150) valve trays with (146) ADV™ Trays.
- Converting the top tray in each column to a liquid distributor tray.
- Converting the bottom tray in each column to a vapor distributor tray.
- Installing a new feed distributor.
- Reusing the existing major beams and tower attachments.

After revamp with ADV™ Trays, the Refinery was able to meet the targeted 30% increase in throughput, while maintaining the same overall pressure drop across the tower. In addition, there was a notable increase in tray efficiency after revamp. All four columns were revamped with ADV™ Trays and the same improvements were consistently observed.

**Performance Comparison**

	<u>Before</u>	<u>After</u>
Column Diameter	7'-0"/8'-6"	7'-0"/8'-6"
Type of Internals	Conventional	ADV
Feed Rate	100%	>130%
Purity, wt% HAC:		
Distillate	0.46%	0.43%
Bottom Product	92.8%	93.5%
Column dP, kg/cm <sup>2</sup>	0.47	0.47

