PROJECT REPORT (PR-029)

GAS PLANT – C3 SPLITTER REVAMP

Plant Location: Major Refinery in Asia

Project: C3 Splitter Revamp

Date of Revamp: 2000

PROJECT BACKGROUND AND OBJECTIVES

The C3 Splitter is a key column for LPG fractionation in a Gas Plant to recover propylene. The separation of propylene and propane is difficult due to the close-range boiling points of the two components and a high purity of propylene needs to be maintained for further polymer processing downstream.

Due to the capacity increase of the customer's RFCC Main Fractionator after revamp, increased LPG needs to be sent to the C3 Splitter for processing but it was determined that the existing unit was not able to handle the new capacity. AMT evaluated the existing equipment and performed a process simulation study in order to successfully revamp the subject C3 Splitter in 2000.

The objectives of the revamp were:

1. To increase the unit processing capacity by 35% from 0.20 Mton/yr to 0.27 Mton/yr; and
2. To improve propylene recovery.

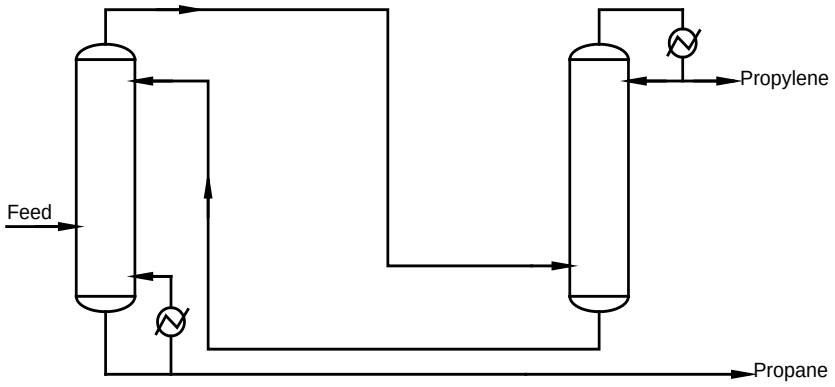
PERFORMANCE BEFORE AND AFTER REVAMP

Before Revamp:
The C3 Splitter had a total of (200) conventional 2-pass valve trays divided into two columns for sequential processing, as shown in the figure below. The feed enters in the mid-section of one column, which has both a stripping and a rectifying section. The other column contains additional rectifying trays.

After Revamp:
ADV® Pinnacle Performance Trays were installed for a one-to-one tray revamp. A new feed location and corresponding distributor was included in the scope of the revamp to effectively decrease the reflux ratio. Reflux and reboiler vapor return distributors were also optimized. The existing tower attachments were reused.

After revamp, the C3 Splitter was able to achieve a processing capacity of 0.30 Mton/yr, over 10% greater than the original revamp objective. The products purities were improved with decreased reflux ratio. See the Table below for a comparison summary before and after revamp.

	Before Revamp	After Revamp
Tray Type	V-1	ADV®
ID (mm)	3000	3000
Capacity	100%	150%
Propylene Purity at Top, vol.%	99.6	99.7
Propane Purity at Btm, vol.%	96.0	99.8
Reflux Ratio	16	<15.7



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