PROJECT REPORT (PR-011)

ACETIC ACID DEHYDRATION COLUMN REVAMP

Customer: Major Chemical Company in Korea

Project: Acetic Acid Dehydration in PTA Plant

Date of Revamp: November, 1997

BACKGROUND

A PTA (purified terephthalic acid) producer has four identical Acetic Acid Dehydration columns with the purpose of removing water from a vapor feed of acetic acid and water mixture. Unlike most distillation columns, these four dehydration columns have no reboilers. Instead, the heat source is provided by a hot vapor feed (from oxidizers) that enter the columns below the bottom tray.

REVAMP OBJECTIVES

The objectives of this revamp were to:

1. Initially increase column capacity by 17% and, ultimately, to meet a >30% increase in capacity; and
2. Maintain the existing product purities.

COLUMN PERFORMANCE

Before Revamp

The first Dehydration Column to be revamped consisted of (60) conventional valve trays. Prior to revamp, the column was achieving acceptable acetic acid, or HAc, purities.

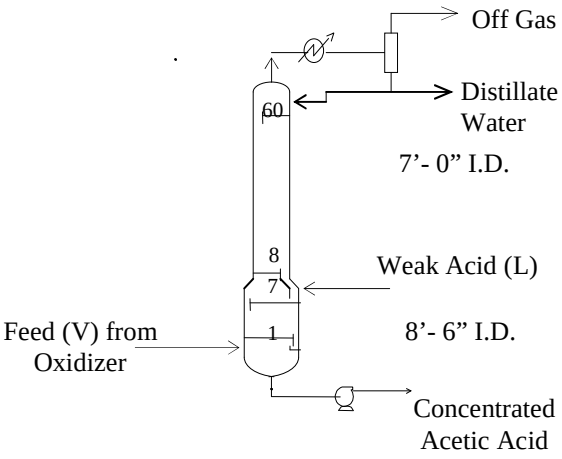
After Revamp

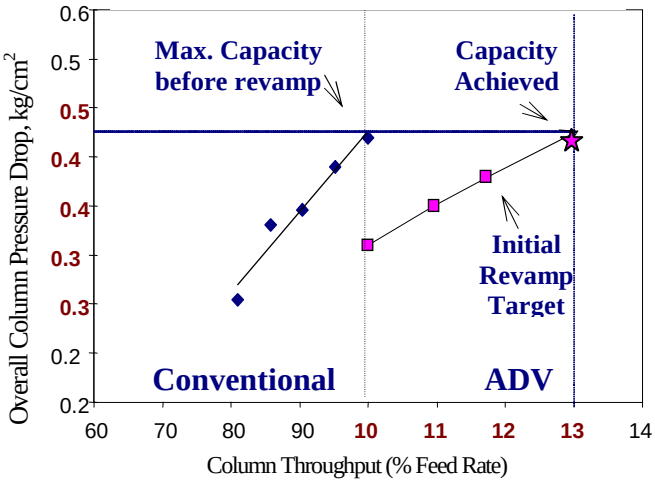
To meet the revamp objectives, AMT proposed to replace all of the existing trays with AMT's field-proven, high performance ADV Advanced Dispersion Valve Trays for this service. Since it was found that the downcomers of the existing trays were oversized and to balance tray design for the new trays in terms of jet flood and downcomer capacity, the original segmental downcomers were converted to swept-back downcomers throughout the columns, which resulted in marginal increase in active areas and outlet weir lengths.

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

	Before	After
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^2	0.47	0.47





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For more information, please contact AMT International Inc., 100 N. Central Expwy., Suite 1100, Richardson, Texas 75080, USA. Tel: 972-783-1770, Fax: 972-783-1848, Email: information@amtintl.com