Petrochemical Plant Troubleshoots with Aspen Plus® and Saves $2.4M USD per Year
“Aspen Plus is a very useful tool to predict and troubleshoot actual plant behavior, helping us to validate the actual performance and predict performance for revised hardware/operating conditions. Additionally, Aspen Plus helps us to optimize the new configurations.”

- Karuna Potdar, Vice President
  Reliance Industries Limited

Reliance Industries Limited is an Indian conglomerate holding company. Reliance businesses span hydrocarbon exploration and production, petroleum refining and marketing, petrochemicals, retail and telecommunications. They strive to maintain innovation-led growth in each of these areas and achieve global leadership by maintaining their position as the largest polyester yarn and fiber producer in the world and a leading producer of ultra-clean fuels.

Reliance Industries uses the aspenONE® Engineering suite of products in many of their businesses when designing new plants, revamping existing plants, and troubleshooting underperforming units. Using solutions

Toluene separation was disrupted due to unit shutdown. In order to avoid the loss, the revamp for benzene-toluene became essential.

<table>
<thead>
<tr>
<th>CUSTOMER PROFILE - Reliance Industries Limited - Energy, Petrochemicals, Textiles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHALLENGE</strong></td>
</tr>
<tr>
<td>Toluene separation was disrupted due to an offsite unit shut down, therefore an urgent revamp was needed to employ the local separation unit.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>SOLUTION</strong></td>
</tr>
<tr>
<td>To effectively troubleshoot the benzene/toluene units, an Aspen Plus model matched to plant data was developed.</td>
</tr>
</tbody>
</table>
like Aspen Plus®, Aspen HYSYS®, and Aspen Capital Cost Estimator (ACCE), Reliance can address a multitude of design, operational, and estimating challenges across their E&P, petroleum refining, and petrochemicals businesses to increase production and drive down operating and capital costs.

**MATCHING DESIGN AND PLANT DATA**

Using Aspen Plus and plant data, Reliance built a model rigorous enough to correctly explain what was occurring in the underperforming unit. Reliance determined that poor benzene-toluene separation tower efficiency was the reason (55% vs 76% in design) and found the benzene column to be hydraulically limited. Since the separation column required more trays to reach the required performance, a redundant column was identified as a potential alternative to avoid column replacement or re-traying, which would result in further losses in production. By confirming that the redundant column could be used as a stripper and reconfiguring the two columns, Reliance could effectively reach the required separation and locally separate the toluene.

The scheme was implemented successfully and the actual column performance matched the predicted performance by the Aspen Plus model. This change resulted in a savings of $2.4 million dollars a year.

To further improve the process, the feed temperature was optimized to handle the revised load and heat from the upstream of the process that was integrated to reduce the utility costs. Furthermore, a suitable control scheme was identified and implemented to meet the tight specifications for benzene and toluene.

Reliance effectively reached the required separation through plant configuration changes to locally separate toluene. This change resulted in a savings of $2.4 million dollars a year.

**UNDERPERFORMING UNIT AND REVENUE LOSS**

The existing benzene separation column was underperforming, with the benzene content in the bottoms being higher than the required 200 ppm, resulting in an unsuccessful planned revamp for benzene-toluene separation. The vendor was unable to offer a viable solution to the underperforming column, stating the column was too tightly designed resulting in offsite processing of the benzene column bottoms containing toluene and heavies.

Following the shutdown of the offsite processing facility, the revamp for benzene-toluene became essential. Because of heavy losses due to the lack of a local toluene separation facility, an urgent revamp became critical. Reliance turned to Aspen Plus and the hydraulic modeling capabilities to troubleshoot the underperforming column and find a viable alternative. This was completed in-house, avoiding the costs and delay associated with getting help from an outside simulation expert.

**With the urgency of the situation, Reliance turned to Aspen Plus to complete the analysis in-house, avoiding the costs and delay associated with an outside simulation expert.**
PROCESS SIMULATION IN THE FUTURE

With advancements in technology and changes in raw materials and product specifications, organizations like Reliance with businesses in the refining, petrochemical, and textile industries, must be able to adapt to stay competitive and maintain market leadership. With Aspen Plus and the aspenONE Engineering suite, Reliance can predict and troubleshoot actual plant behavior, allowing them to validate actual performance and predict performance for revised hardware/operating conditions.

AspenTech is a leading supplier of software that optimizes process manufacturing—for energy, chemicals, engineering and construction, and other industries that manufacture and produce products from a chemical process. With integrated aspenONE® solutions, process manufacturers can implement best practices for optimizing their engineering, manufacturing, and supply chain operations. As a result, AspenTech customers are better able to increase capacity, improve margins, reduce costs, and become more energy efficient. To see how the world’s leading process manufacturers rely on AspenTech to achieve their operational excellence goals, visit www.aspentech.com.

Worldwide Headquarters
Aspen Technology, Inc.
20 Crosby Drive | Bedford, MA 01730 | United States
phone: +1-781-221-6400 | fax: +1-781-221-6410 | info@aspentech.com

Regional Headquarters
Houston, TX | United States
phone: +1-281-584-1000
São Paulo | Brazil
phone: +55-11-3443-6261
Reading | United Kingdom
phone: +44-(0)-1189-226400
Singapore | Republic of Singapore
phone: +65-6395-3900
Manama | Bahrain
phone: +973-1360-400

For a complete list of offices, please visit www.aspentech.com/locations.

© 2015 Aspen Technology, Inc. AspenTech®, aspenONE®, the Aspen leaf logo, the aspenONE logo and OPTIMIZE are trademarks of Aspen Technology, Inc. All rights reserved. 11-7756-0815