Increased Capacity and Greater Efficiency in Benzene and Toluene Towers

Customer: Leading German refinery

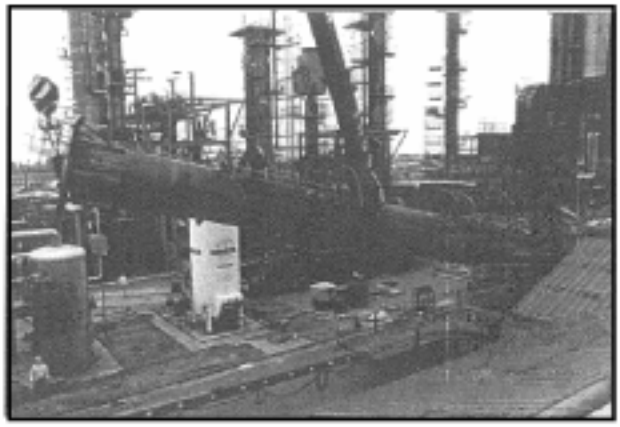
Location: Northern Germany

Problem: Two existing benzene and toluene columns could not meet an increase in demand for aromatics. The customer required 30% more capacity and 40% greater efficiency. A revamp shutdown could be no longer than one week.

History: Built in 1962, the aromatics unit was fitted with bubble cap trays. These were later replaced with GLITSCH® BALLAST® trays, but when the market began an upswing, even more capacity and more theoretical stages were desired. A structured packing revamp required a three week turnaround. Three weeks loss of production and hundreds of thousands of dollars of lost revenue was not acceptable. The customer asked for a solution which would reduce downtime to five days.

Solution: Replace the existing towers with two new towers fitted with high efficiency structured packing. Glitsch prepared a computer simulation of the separation system, which satisfied the customers needs. Glitsch then guaranteed the number of theoretical stages and throughput in the two column system. The turnkey proposal outlined complete replacement of the two towers, including installation of structured packing and installation of high efficiency distributors to gain the desired performance improvement.

The vessel fabricator pressure tested both columns. The columns were sent in two pieces to the refinery, welded and 100% X-rayed. To meet the turnaround schedule, the vessels were fitted with ladders and platforms, and insulated in place prior to erection. Glitsch Field Services removed the existing towers and erected the two new towers in under two days. For the next three days, 24 hours a day, the tower internals were installed by Glitsch Field Services. The job was completed on schedule.



Results: Start-up was smooth and uneventful. Initial feed rates at 90% of design were limited only by the amount of feedstock available. The much lower pressure drops of a structured packing tower (90 to 100 mm Hg vs. 375 mm Hg for trays) and the lower hold-up in packings provoked the only questions and, when additional feedstock was available, the tower was easily pushed to design rates. Glitsch met all guarantees—the number of theoretical stages was actually 10% more than guaranteed. Toluene in the top product off the benzene tower was 50-60 ppm, better than the 100 ppm that had been specified.

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