Staffing Adjustments to Ensure Performance Success of Proposed Olefin Expansion

A Q1 Day 1™ Level 3 process analysis in the design and construction phase identifies need for maintenance staff optimization

CHALLENGE
A company wanted to estimate the performance of a proposed expansion of a US olefin plant.

SOLUTION
The company utilized a Q1 Day 1 Level 3 process analysis of the planned expansion to determine performance and identify performance gaps.

RESULTS
The recommendations identified for optimizing work processes and planned staffing should allow the facility expansion to achieve optimal performance.

Hydrocarbon losses, property taxes to hit performance

A major petrochemical operator needed to evaluate the future performance of a planned expansion of a US olefin plant that was in the design and construction phase. The company, already familiar with Solomon’s capabilities, requested a Q1 Day 1 (first quartile from first day of operation) Level 3 process analysis for the facility. This analysis process is used to estimate plant performance and identify ways the company can minimize risk and maximize a facility’s return on investment in the categories shown in Figure 1.

The analysis was conducted using a “synthetic plant” created from Solomon’s 2015 Worldwide Olefin Plant Performance Analysis (Olefin Study) featuring the latest large-scale operating technologies for light-feed olefin plants. The case was then compared to the average for a custom peer group (CPG) of plants similar in design, size, complexity, and location.

The results show the expansion is capable of best-in-world performance, but performance gaps were identified related to two factors.
The first is the extremely low hydrocarbon loss across the facility; the latest technology is unable to sustain losses at reported levels between turnarounds (T/As). The second is excessive property taxes, which impacts all financial metrics, including margins and return on investment.

Assessing personnel levels at operational stages

A three-tier staffing analysis defined optimum staffing level targets for the initial start of operation.

The planned number of employees to manage the expansion workload during Tier 1 operations, or initial operations, was consistent with the analysis recommendation. The analysis indicated that the company should reduce the number of operating management positions in Tier 1 to balance the work hours closely with those sustained by the CPG. The planned Tier 1 staffing had a very high scheduled amount of overtime compared to the CPG, but the operator has consistently and successfully utilized this strategy in the past.

The analysis indicated the company should add more staffing to Tier 2 operations, or the first 1-2 years of operations, and use the typical regional organization structure for staffing the plant through the start of operations to the facility’s first scheduled T/A. Adding extra staff during Tier 2 would help eliminate difficulties in managing unscheduled overtime and providing extra manpower during the T/A.

Tier 3 of the analysis recommended that the organization increase the number of full-time equivalent employees across all departments to manage scheduled overtime.

The company was also encouraged to adapt a work schedule similar to that of regional competitors to maintain a staff of stable, well-trained employees.

The company made key staffing adjustments based on the analysis’ recommendations, particularly around its maintenance workforce. By following the recommendations, the operator should be able to achieve optimal performance in the plant expansion.