Refinery to Reap Savings, Achieve Top-Quartile Performance Through Restructuring of Maintenance Work Processes, Workforce

Solomon’s Workforce Optimization (WFO) analysis identifies opportunities to ensure efficient and effective work processes are implemented.

CHALLENGE

A refinery was not fully utilizing its maintenance staff to eliminate defects and assure asset reliability, causing maintenance reliability to be lower than those of top-quartile performers.

SOLUTION

Using its Workforce Optimization analysis, Solomon identified changes to the facility’s work processes and workforce to enhance reliability.

RESULTS

By implementing the recommended changes, the operator could enhance maintenance reliability and reap savings of over 25 million USD per year.

Looking for opportunities in best practices

The owner of a US refinery wanted to optimize the facility’s work processes and workforce to maximize its financial performance. Using its Workforce Optimization (WFO) analysis, Solomon assessed the refinery’s staffing compared with a custom peer group (CPG) of refineries similar in size and complexity that demonstrated first-quartile operational availability performance.

Lack of effective utilization of maintenance staff

The project involved Solomon consultants interviewing 20% of the workforce, reviewing procedures, and scoring best practices. This evaluation included a review of the structure, capabilities, and work processes as compared to Solomon Best Practices, refer to Figure 1. Solomon found that the organization already was performing at a good level, having implemented more than 85% of industry best practices. The facility also had remained competitive through the years due to routine onsite preventative maintenance. However, the 15% of identified performance gaps represented major opportunities for improvement. The facility employed a higher level of non-maintenance staff than CPG companies and was achieving maintenance reliability results below those of top-quartile performers in the CPG group. Solomon also found that the refinery’s maintenance staff was not utilized as much as the CPG companies in eliminating defects and assuring asset reliability. While workers were aware the facility had a goal of achieving high reliability, little understanding existed within the workforce in how to meet this goal.
Achieving high reliability

To optimize the refinery’s work processes for better reliability, Solomon recommended the client create a refinery-level reliability management organization. Solomon also suggested other strategic reliability improvements be made, such as the implementation of defect elimination and reliability investigation programs, and a reliability-centered maintenance methodology. Additionally, Solomon advised the client to develop a consistent risk assessment methodology. In terms of tactical reliability improvements, Solomon recommended the client form a reliability steering committee, create area maintenance engineer roles and a reliability strategic business plan, and develop and deploy a reliability policy.

Staffing recommendations

Solomon recommended the client optimize staffing in key areas of project engineering and operations and engineering to meet future needs. Sustainable optimization is outlined through clearly defined goals and objectives as shown in Figure 2. Solomon advised the client to make these changes both through attrition over time and the reassignment of full-time engineers in existing groups to focus on area maintenance and reactive defect elimination. These reliability engineers would primarily provide technical support to operations and maintenance. Solomon also proposed responsibilities for some existing roles be expanded, workers be cross-trained on jobs to allow more flexibility in covering vacancies, and compensation practices change.

Eliminating capital project waste

Solomon also saw an opportunity for improvement in the refinery’s capital project group. The group—one of the largest Solomon has ever seen—tended to categorize all project ideas as capital projects without focusing on non-capital improvements first. As a result, the group was spending money and directing manpower to study projects but later rejecting many of them, meaning the analysis effort was “non-value-added work” and consumed resources unnecessarily.

Instead of designating all process unit projects to the capital projects group, Solomon recommended the client refocus approximately half of these projects to its area teams utilizing constraint-busting methodology. Solomon also advised the client to optimize its non-major capital and expense projects process and its check-out procedure.

This new approach is expected to help process engineers better understand their process areas and the factors that limit the processes and equipment. It can also help them understand how their area of responsibility impacts the refinery’s profitability, and the value of working around or removing constraints. Solomon estimates the approach would improve profitability by 0.02 United States dollar per barrel (USD/bbl) or 1.5 million USD per year.
The path to top-quartile performance

Solomon identified more than 25 million USD in savings per year associated with work process improvements and workforce optimization, as well as opportunities to capture additional value. By refocusing the refinery’s workforce towards maintenance, establishing metrics, and creating solutions to improve reliability, Solomon has set the client on a path towards achieving top-quartile performance relative to its CPG.