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LUBES'N'GREASES

**Taming
Turnarounds**

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Taming the Terror of Turnarounds



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erhaps the most stress-inducing times at refineries occur during maintenance shutdowns or turnarounds, events requiring Herculean efforts in organizing manpower and mobilizing material on a massive scale. Every day of a turnaround presents new challenges and possible pitfalls, but if done correctly, the end results are greater efficiency and higher profitability for companies.

One in four oil industry professionals rated their turnaround below a five on a scale of one to ten, in a 2016 poll by Oil & Gas IQ; the average rating was only 6.7.

Industry professionals told *Lubes'n'Greases* that a number of factors exacerbate the headaches associated with turnarounds, from factors stemming from outside the plant—corporate headquarters breathing down their necks to stay on schedule and on budget, to those within the plant—cramped spaces, untrained workers and inadequate planning.

The scope of a turnaround is simple: to sustain operation of the refinery by inspecting and testing equipment and conducting mechanical repairs and upgrades, according to Mumbai, India-based conglomerate Essar, which declined *Lubes'n'Greases'* interview request, but provided educational videos about its oil and gas industry activities.

If defining the scope of a turnaround is easy, the actual work is not, said Kevin Buck, senior business leader for Hydroprocessing at Des Plaines, Illinois-based Honeywell UOP, which supplies and licenses technology for the oil industry. "Some [turnarounds] require crews to check equipment

from reactors and catalysts to on/off valves, while others focus on a certain piece of equipment," he said.

Turnarounds are a response to the need for periodic maintenance or renovation of facilities. At base oil plants, they are usually scheduled every three to four years for API Group II and III facilities and every five years for API Group I plants, said Stephen B. Ames, managing director of SBA Consulting LLC in Pepper Pike, Ohio. Ames has 50 years of experience in the downstream oil industry, including positions with Gulf Oil Corp., the former Standard Oil of Ohio and BP.

"There are no firm rules for shutdowns, as it is highly dependent upon the age and past maintenance of the units, feedstock quality and the severity of the operations," he explained. "Old Group I plants may have equipment that has greater need of maintenance.

"For Group II and Group III plants, the quality of feedstock and level of operational severity (for example, producing stocks with higher viscosity index or lower Noack volatility) may dictate the length of runs. Poorer quality feedstock or higher severity operations generally correlate with a shorter period between turnarounds," said Ames.

Both Ames and Buck said turnarounds can include myriad activities: preventative equipment maintenance, general corrections or repairs, and even complete replacements or overhauls of certain units. However, "the biggest pressure during a turnaround is to get the refineries back online," said Buck. "During a turnaround, refineries aren't making money."

The direct cost and the loss of productivity is why some refinery operators delay or even skip performing turnarounds, according to Frost & Sullivan.

“Refinery maintenance is often overlooked due to high costs, shutdown time and the resultant loss of production,” the 2013 survey of the global oil and gas refinery maintenance, repair and overhaul services market found.

Lubes’n’Greases reached out to a

for a high-complexity job clock in at about 20 percent. Schedule slips are almost three times greater at a highly complex job than at a less complex project—about 30 percent versus 10 percent, respectively.

Essar explained that staffing for larger projects can run as high as 40,000 to 60,000 people. Contractors and subcontractors bringing new, untrained or undertrained employees to the jobs is a key reason for missed deadlines and

and Petrochemicals World conference last year in Vietnam. “If your challenges are not technical, stop seeking technical improvements... People are the key to safety and performance on turnarounds,” he emphasized.

Some in the industry would call this view unorthodox; others would say it’s heresy. But a shift in thinking is vital for more successful turnarounds, Goddu said. Thinking should switch from control to enroll. “The culture of getting people engaged is more important than what you’re doing,” he explained. Important factors in achieving that engagement are a focus on culture and leadership, and engagement with the contractors to form one team.

Goddu said he experienced some pushback on this new approach to turnarounds. Some engineers and managers believe the old ways served a purpose.

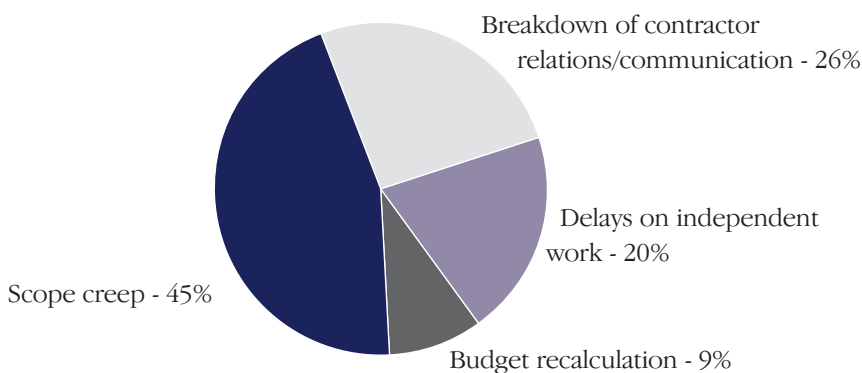
But he’s adamant that the new way of thinking about the turnaround process will result in more success. Look no further than the statistics, he said; they clearly show a pattern of lost money and opportunities.

The current culture of turnarounds includes an “us versus them” mentality, Goddu observed, where an expanding workforce and contractors are the scapegoats for blown finances and missed deadlines. Additionally, the top priority is bringing the project in on schedule and on budget. Goddu described this as a “don’t screw up” mentality.

He argued that instead companies should use an “integral” approach. Maintenance managers should switch from the current “default” mode to a “high integrity” model of shared commitment and goals, where contractors and key sub-contractors lead the execution team. “Contractors must be brought into the planning,” he said. “They must be treated as partners. People love to work for a cause and see their contribution in it.”

He cited a number of successful client turnarounds using this integral approach. At an Indian plant that Goddu described as one of the largest refineries in the world, a 10,000-person

Principal Source of Overruns during Turnarounds



Source: Oil & Gas IQ, 2016

number of base oil producers for comments for this story, but they did not reply or declined to comment, citing proprietary information.

Ames said most refineries have their own maintenance departments that decide which units are taken down and what work needs to be done when. The staff also supervises contract labor used for non-management activities.

Turnarounds can last as little as a few weeks to as long as several months. Extending a major turnaround, industry experts said, can result in market shortages, skyrocketing prices or both. This can have a negative effect on the whole industry, as other suppliers are strained to meet demand.

According to Mike Goddu, co-founder of Austin, Texas-based consulting firm MJM Associates, highly complex turnarounds incur much higher average cost overruns and schedule slips, and their performance is less predictable compared to simpler projects. Cost overruns for a low-complexity project are around 5 percent, while overruns

budgetary overruns, the company said.

The Oil & Gas IQ survey cited scope creep as the principal cause of overruns in the turnaround process, reporting that this was at the heart of 45 percent of over-budget projects. Scope creep refers to an unexpected increase in a project’s requirements after work has begun. Breakdowns of the relationship or communication with contractors accounted for 26 percent, delays on independent work for 20 percent and budget recalculation for 9 percent.

A New Approach

For more than three decades, MJM’s Goddu has worked with large and small companies, including a number of base oil facilities, on refinery turnarounds. MJM customers include ExxonMobil, Shell and Total. He’s seen his share of successful turnarounds as well as failures.

“The biggest challenges to most turnarounds are culture- and organization-related. What’s missing is leadership, not management,” he told the Refining

workforce completed a 2017 turnaround with just one lost-time injury in which a worker fell from a bicycle on site.

Both Buck and Goddu agreed that turnarounds are fraught with danger, but that danger can be contained. “When a person is involved, you want to make sure they are not at risk,” said Buck. “Safety has to be job one—it has to be.”

A current turnaround project in Asia, which included contractors in the two years of planning, is experiencing success, he said.

Those successes were achieved by “gaining the respect, attention and engagement of supervisors and workers from day one,” said Goddu, who is based in Singapore.

Increased Demand

Global base oil capacity continues to expand, and each plant—new or old—will eventually need maintenance.

Buck and Goddu said young employees are vital to help meet the growing demand in the energy sector.

Goddu said that young workers are needed in “all aspects of the industry, and they will reap rewards from the expected growth in most sectors, the need to overhaul the others, and replacement of the sources and sectors that are going away.”

The skills needed will be technical, both men said, presenting opportunities especially for young people with engineering degrees of many kinds. “But of even greater need will be young professionals and managers with what’s called holistic skills—the ability to see the big picture, embrace change, lead people, bring teams and aligned suppliers and licensors on a path to the future, not clinging to the past. This will show up in all areas, including refitting old plants and bringing new ones online,” said Goddu.

JMJ and Honeywell both provide development opportunities for young people, giving new workers the chance to learn from employees with more than 40 years of experience. ■

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