Case Study: TOPS® Methodology

Improving Startup/Shutdown Processes: Saving Millions, Reducing Incidents, and Improving Operator Morale

A large South American petroleum company’s primary near-term goal is to achieve “membership” in the top 27 companies in the Petroleum Intelligence Weekly ranking by the year 2015. As part of the company’s effort to improve its international ranking, it wanted to upgrade various aspects of its operations. The company identified the following issues:

- Operators faced challenges in performing startup/shutdown (SU/SD) activities in a safe and efficient manner.
  - A lack of access to training and experience with industry best practices existed.
  - Units often had access to only outdated procedures and manuals.
  - Materials existed only in hard-copy format and were difficult to update.
  - Employees were sometimes trained with incorrect or incomplete documentation.

- Varying levels of knowledge and experience—due to the lack of a formal training structure and the lack of a process to update procedures—contributed to incidents, lengthy commissioning, and weak morale.

- Inefficient SU/SD procedures added millions of dollars in expenses per year across all units.
  - Some unit shutdowns took an entire day, followed by a startup of two days.
  - A single day could cost $20,000 to a quarter-million dollars.

- Lack of context and unit knowledge led to waste and knowledge gaps.
  - Employees focused too much on specific tasks and did not understand the big picture of their unit and refinery operations.

These issues led to inefficiencies and greatly increased risk, which cost the company millions of dollars in repairs, time and production lost, and more. The company partnered with GP Strategies™ to solve these issues.

Teaming to Produce Solutions

GP Strategies experts partnered with the company’s subject matter experts and developed leaders at the facilities who would understand and know how to teach best practices. Not only did this involve identifying best practices for specific process units, but also identifying the refinery-wide best practices to give workers the “big picture” that they needed. Since GP Strategies has worked with so many of the world’s top petroleum organizations, GP Strategies was ideally suited to provide the South American petroleum company with state-of-the-art knowledge for specific processes, as well as for general refinery operations.

Working together, GP Strategies and the company published the refineries’ new best practices, both as hard copy and online, onto the company’s network. Now they are readily available for training and reference, and far easier to manage and update.

Drawing from extensive experience in petroleum plant training, GP Strategies staff instructed the trainers who would be transforming the way in which employees worked and helped define and implement various improvements. GP Strategies created and deployed the following training tools that convey the most effective, efficient, and safe ways to execute procedures:

- Procedure sequence flow diagrams (PSFDs), which visually describe how a particular procedure is carried out. They optimize SU/SD in terms of timing and resources. The PSFDs help operators to memorize their tasks and understand why they’re expected to take certain actions.
• Large control diagrams (LCDs), which are the basis for practically all the tools that GP Strategies provides for optimizing and running petroleum plants. They’re used to train operators on procedures and to review emergency response steps. They define how a unit reacts when there is some change in a variable and help to troubleshoot a unit to come up with prompt answers.

• Task Reference Analyses (ATRs), which are procedures developed by the South American petroleum company refineries for implementing the task of the operators.

• Updated procedure manuals and emergency procedures and made them much easier to use—whether on paper or electronically.

• Testing of employees to identify knowledge gaps and determine opportunities for improvement. The same test was administered after the training to gauge the effectiveness of training materials and instruction.

SU/SD Improvements Realized
GP Strategies applied its Technical Operations Performance Support TOPS methodology, which has helped contribute to incident-free SUs/SDs by providing:

• Operators with the tools to make optimal decisions.

• Improved troubleshooting and emergency management.

• An established methodology and systematic tool to raise the level of the operators’ performance to high standards.

In addition, a month before each SU/SD, workshops are held to refresh the operators’ skills and knowledge, and prepare them for the event. After a startup or shutdown has occurred, a lessons-learned workshop is held to review the completed process—looking for opportunities for further improvement and examining any issues that may have arisen.

Day-to-day operations benefit from procedure documentation that tags each instrument, valve, or other piece of equipment throughout the refineries that has not been previously identified.

The SU/SD campaign has produced dramatic improvements. Personnel who have received the training have been able to consistently minimize turnaround time.

The Impact
After GP Strategies helped to improve the South American petroleum company’s training and SU/SD procedures, the company achieved significant results:

• Shutdown takes only 10 hours.

• Startup takes only one day.

• Estimated cost savings amount to millions of dollars per year.

• Safety and equipment incidents have been reduced.

• Health, safety, and environmental indicators have been improved.

• Worker morale has climbed.

• Operators enjoy greater mastery and personal investment in their plants’ success.

While the company hasn’t yet attained its goal of cracking the top 27 in the Petroleum Intelligence Weekly ranking, its campaign with GP Strategies helps to lay the foundation for this achievement.