

## Case Study: North American Energy Company Plant Launch Project: Chemical Processing Plant

### Client Need

A North American energy company decided to launch a new facility with the goal of having more control over their costs while achieving close to zero harmful emissions. The company developed a plan to implement process safety programs, design and deliver training internally, and perform comprehensive pre-startup qualification activities in order to successfully transfer to a more reliable resource to power the plant and achieve better cost control and improved overall efficiency.

To accomplish its goals, the company developed a new technology based on the coal gasification process to use low-value coal to power the plant and capture all by-products to sell as consumables. During the construction phase of the project, the company recognized a need for more robust procedures and training materials to align with Process Safety Management (PSM) requirements that would satisfy the needs of a plant with significant new technology and complexity. In addition, the company needed more detailed guidance and structured program elements for the management of highly hazardous materials.

### GP Strategies Solution

The company entered into a partnership with GP Strategies™ to ensure a successful plant launch. A team from GP Strategies performed the first step, a gap analysis, which included identifying needed training, technical documentation, procedures, and recommendations. The team drew on GP Strategies' extensive experience helping businesses pass OSHA standards to identify industry standards and best practices that fit this company's needs. The gap analysis concluded with the following recommendations:

- Establish a path forward that achieves the company's training and qualification goals in time for facility startup
- Merge current program elements into a perpetual program that complies with PSM standards
- Adapt industry best practices for training and qualification that provides:
  - Manageability and sustainability over time
  - Reduced time to qualification

The overarching goal was to achieve qualified operators in time for facility startup while addressing all regulatory requirements related to PSM.

GP Strategies worked in collaboration with the company to create an Operator Training and Qualification Process to rapidly and effectively onboard new employees from entry-level and duty-area training to post-qualification training. This process included a blended learning strategy with elements such as eLearning for plant fundamentals and simulations; structured, knowledge-based theory and application exercises; gun drills; skills demonstrations; and much more.



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GP Strategies developed customized technical documentation specific to the new facility for exercises and drills, operational and unit reference information, and corporate policies and procedures. The documentation developed and revised includes:

- Unit-specific troubleshooting exercises
- Emergency response matrices
- Gun drills
- Field training guides
- Large control diagrams
- Process description manuals
- Startup and shutdown procedures
- Emergency procedures
- Document standardization

As part of the troubleshooting package offered, GP Strategies developed Troubleshooting Workbooks. The example below is from a “What if” exercise. It provides the root cause “What if feed increases?” and the operators provide the symptoms, deciding how the unit is going to react and why.

## Client Impacts

Implementing these solutions has numerous proven benefits such as operators achieving rapid familiarity with major equipment, policies, and procedures. This solution was accomplished using a combination of GP Strategies’ vast experience in the industry and expertise with adult learning. ■



**“WHAT IF” Exercise: Feed API Decreases (Feed Becomes Heavier)**

**1. Situation**  
The FCC is operating normally when there is a decrease in the API of the feed from the Crude Unit. This results in heavier hot feed to the FCC.  
The Reactor and Regenerator have responded and there is a shift in the composition of the cracked feed to the Fractionator, indicated by increased wet gas, decreased LCN, decreased HCN, increased LCO, and increased HCO.

**2. Process Response**  
After the trainee has indicated the system response with a red marker on the LCD, discuss each of the following key points.

**Key Parameter Response Table**

Parameter	Direction of Initial Change	Steady State Change	Comments
Top Temperature	4. ↑	---	The reflux flow is on temperature control and should be able to handle the temperature shift.
HCN Draw Temperature	3. ↑	↑	HCN P/A flow is manually set. Since no auto-adjustments have taken place, the temperature rises.
LCO Draw Temperature	2. ↑	↑	LCO P/A flow is manually set. Same comments as for HCN Draw Temperature.

**3. Concern(s)**  
Ratio of reflux to overhead liquid (LCN flow) will be greater than 1:1, which can lead to flooding. Shifted temperature profile will result in heavier material at LCO and HCN side draws.

**4. Corrective Actions**  
What are key questions that should be asked and what are the appropriate corrective actions?

Key Question(s)	Corrective Action(s)
Should the operator make adjustments to the temperature profile?	Yes. Operator should react from the bottom of the tower up as follows: - Increase flow through steam generators in HCO P/A.

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