



Process Safety as a Career Foundation

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Abstract

The foundation of one's profession can have an exponential effect on the lifelong development of their careers. There may be no stronger launching point than the lessons learned as a young engineer specializing in process safety. A young engineer building a foundation on process safety may have the opportunity to work on and visit a magnitude of different processes and environments. One may also see similar processes operated in different manners. However, a vast range of exposure is not the only valuable material in the development of a career. In a relatively short period of time, one specializing in process safety can learn to understand how safety can sometimes become an afterthought for many process engineers. This can ultimately lead to costly or even life-threatening consequences that must be addressed reactively. With a foundation in process safety, one is of the mindset to address safety issues in a proactive manner, and thus ultimately becoming a more efficient engineer.

Smith & Burgess
Process Safety Consulting

1. Introduction

Every young engineer leaving school to begin their career has various ideas of what they would like to accomplish. Process safety offers young engineers a tool that can form a platform for multiple career paths. In order to understand the opportunities a young engineer can create for themselves, a glance into how the variety of lessons learned in the first few years of process safety can help create opportunities and influences.

2. Process Safety as a Career Foundation

2.1 *Diversified Process Experience*

Process safety applies across many different fields of process engineering and gives young engineers the opportunity to diversify their process knowledge.

2.1.1 Process Safety in Refining

A young process safety engineer often has the opportunity to work in oil and gas refineries to develop the necessary safety documentation. A process safety engineer working on refinery documentation will not be limited to one unit/process, but will gain exposure to various refining units/processes.

Even brief experiences with new process units offer new learning opportunities. When evaluating a new process for upset conditions, a process safety engineer must understand how minor changes can affect the system. For example, the exact same refinery could drastically change the process to maximize its diesel production and this could have an effect on the entire analysis. It is differences like this that offer opportunities to grow as an engineer.

2.1.2 Process Safety in Petrochemicals

When a process safety engineer is working with a petrochemical facility, there is an opportunity to learn about the effects specialty chemicals can have on a process unit. Many specialty chemicals create unique hazards that must be understood to correctly understand process upsets. For example, when dealing with a component that may decompose when exposed to heat, it may be insufficient to use a standard external fire overpressure analysis. The actual required protection from overpressure may be controlled by the rate of decomposition.

Each chemical facility will offer learning experiences that are unique because when dealing with a unique process, unique considerations must be made regarding safety.

2.1.3 Safety Engineers Don't Get Caught in the Weeds

Unlike process engineers working to optimize units, engineers in process safety spend much of their time learning and understanding processes. Very rarely would a young engineer in process safety spend more than a few days on a single problem where a unit process engineer may spend multiple weeks working towards optimizing a single heat exchanger. This lack of time spent working on the tiniest of details allows for far greater exposure to the industry and provides a much steeper learning curve for engineers to develop.

2.2 Safety Applies to All Business Levels

An engineer can decide to take a technical career path, a managerial career path, or a combination of both. However, safety is a factor no matter what career path is taken.

2.2.1 Safety as a Plant Engineer

A plant unit engineer will be responsible for maintaining and enhancing their respective unit in order to continue to make products with profit in mind. While doing this, the unit engineer must know that the process is also safe. After a young engineer spends their first few years in process safety, no decision/change would be approved or made without considering process safety. This creates an engineer with an understanding of the safety impacts that can make proactive safety decisions rather reactive recovery decisions.

2.2.2 Safety as an Engineering Manager

Later into an engineer's career, management may be the chosen career path. Although it may take time and various positions, this manager will be faced with many decisions. It is a fact that many of these decisions will be critical safety decisions that could affect a capitol project, a process unit, a small company, a corporation, or an industry.

Decisions that can have that type of effect should always be made with safety in mind. An engineering manager that spent their first few years in process safety could make these decisions with confidence based on the lessons learned early in their career.

2.2.3 Safety as a Corporate Engineer

Engineers that progress into the corporate engineering ranks must also have a sound understanding of the safety impacts changes can have on an organization. Corporate safety directives and initiatives must be well thought out based on both the impacts they will have on a facility's operations and the value added (process safety can create value even if profit is not quantifiable).

2.3 Safety as an Afterthought

Many process engineers' main concerns lie with creating and maintaining more efficient processes in order to make them more profitable. This is key for any industry, as no industry would survive without innovation; however, this thought process may result in engineers having tunnel vision on that goal. This in turn can cause process safety to be an afterthought instead of something at the forefront of the decision making process. When process safety is at the forefront of any decision, it has the potential to prevent costly and life threatening incidents.

Conclusion

There are hundreds of different ways to begin a career as a chemical engineer, process safety being one of them. Beginning a career in process safety offers young engineers an opportunity to build a solid foundation in a diverse way. How an engineer evolves over their career will depend on their knowledge gained and work ethic, but lessons learned by a young engineer in process safety could greatly enhance this career.