Practicing Chemical Process Safety: 
A Look at Layers of Protection

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Introduction

World-Class Chemical Plants typically focus on a mission with at least four distinct elements. The focus of these elements: provide continuous customer satisfaction; strive to provide a safe work environment; strive to fully protect the environment; and be a low-cost producer. Over the past decade numerous organizations accepted the challenges to incorporate all the requirements of the U.S. Occupational Safety and Health (OSHA) Process Safety Management (PSM) Standard and Practice Chemical Process Safety in a performance-based manner. The PSM standard required a quantum leap in well-developed procedures and readily available documented information. While increased protection of the worker was the focus of the PSM standard, enhanced preservation of the environment was a bonus.

Those corporations who accepted the challenge by using these performance-based standards are being rewarded. Good access to key information is paramount in any well-run organization. Many locations developed or improved extensive electronic data bases to cope with PSM requirements.

Today, a chemical plant’s decision process can be enhanced by all the readily available information required by the OSHA PSM Standard. Updated P&ID’s, comprehensive Process Hazard Analysis details, and the well-documented Operating Procedures can help with training and many decisions. The substantial efforts to provide a stronger Mechanical Integrity program should reduce the risks of major leaks and extend the interval between shutdowns. An effective and rigorous use of Management of Change system should help keep information current.

This paper will review public perceptions of safety in the chemical plant workplace. By using Bureau of Labor Statistics, comparisons will be made between the degree of safety experienced while working in a chemical plant to the degree of safety in some better understood occupations.
such as fishers, timber cutters, truck drivers, construction laborers and others trying to make a living. Next, in the heart of this presentation, we will review many of the layers of process safety protection that world-class chemical plants utilize to be proactive in protecting people, property and profit.

Concluding sentences will suggest that an operation supported by multiple layers of effective protection can also provide increased security for the employees, the public and increased profits. However, recent statistics of five-year summaries of property losses provided by Marsh’s Property Risk suggest that we still need lots more practice to reach the goal of making safety second nature.

Finally, there will be a few words to persuade key members of the audience to develop a program similar to the “heart” of this presentation to help convince each company’s employees and their citizen neighbors that Chemical Process Safety is “Second Nature”. Industrial facilities should have ready-to-use presentations supported with action images of their operations to help the community understand the levels of safety that are incorporated in the design, operation and maintenance of our facilities.