

What comes to mind when I think about Process Safety?

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I was asked by the selection committee to say a few words about my experiences in process safety and to keep it reasonably short. I thought perhaps I should prepare some written notes because if I start talking about process safety, it is not going to be reasonably short!

I got into process safety and risk management in 1988 after I was recruited to join the Arthur D. Little EHS group by Dr. Elizabeth Drake, who was a pioneer in LNG safety at the time and an active member of CCPS. Arthur D. Little may have been one of the founding members of CCPS in 1985 or became an active member shortly thereafter. You may all remember that CCPS was formed shortly after the Bhopal tragedy in 1984 and that Arthur D. Little himself was instrumental to the development of chemical engineering as a discipline. I was invited to attend my first DIERS meeting in 1992.

Almost everyone in Liz Drake's group was a skilled EHS professional and I learned a lot. I spent 14 years at Arthur D. Little and rose through the ranks. During those 14 years, while working on various aspects of process safety and risk management, I can say without a doubt that I was not bored for one single second. Process safety is never boring.

I did not realize until much later during my tenure at Arthur D. Little that Process Safety was truly an "**Apex Discipline**". You probably do not hear that often. You may be even hearing this for the first time. What I mean by "**Apex Discipline**" is that process safety is much more encompassing than just measurements, modeling, compliance, and chemical engineering.

As a process safety professional and even as a process safety expert, you need to know enough about mechanical engineering, civil engineering, electrical engineering, societal and safety culture considerations, quality management systems, risk management practices, regulatory requirements, industry standards, recognized and generally accepted good engineering practices (RAGAGEP), and so on. Perhaps that is why it takes a long time to mint a process safety professional or expert. I have learned firsthand how encompassing process safety is because of the time I have spent, and I continue to spend on providing litigation support and expert testimony on process safety and risk management practices and requirements.

Once you get into process safety, you realize that it is really a way of life. You also realize that you have become a disciple of the “Power of Negative Thinking” mantra. We are always trying to prevent bad things from happening and to learn from incidents.

It is not always about negative thinking though; in process safety we convert failures into lessons learned and future successes. That is why AIChE through CCPS, the Safety and Health Division, and DIERS, has made and continues to make the world a better and safer place.

We also need to recognize that achieving excellence in process safety is a long and drawn-out exercise. Despite that, process safety is good for business and when properly integrated with other management and business support systems, process safety can also deliver operational and compliance excellence.

It is not always black and white in process safety and risk reduction. We need to consider lifecycle costs when we make important safety and risk decisions or recommendations. We must be aware of how process safety and risk reduction measures can also impact the safety, operability, and maintainability of a process or an entire plant, sometimes negatively.

For example, recommending adding another duplicate relief device to an existing installation just to improve the reliability of relief device actuation upon demand can be detrimental to safety. Having a significantly oversized relief capacity where relief devices have close set points can lead to destructive chatter of the relief devices or the relief piping leading to potential loss of containment. We do not want to be the cardiologist that prescribes heart attack saving medication if the medication can cause the failure of the patient’s kidneys leading to death. Saving the patient from a heart attack at the expense of other important systems is not a good practice.

We need to remember that many plants in the US and worldwide qualify as aging infrastructures that continue to operate today, well beyond their designed or expected operating life. Through debottlenecking, maintenance, and modifications, we have increased throughput and the longevity of these plants. It is important to ensure that this did not and does happen at the expense of reasonable safety margins. We also need to remember that operating multiple facilities increases the overall portfolio risk.

Even after 33 years in process safety, I still struggle at times with how to best communicate difficult risk-reward propositions and investments in safety. It is challenging at times to expend money and resources on losses not yet incurred and on potential losses that may never be incurred. This is especially true for potential high consequence and low probability events or scenarios.

I am convinced that process safety is a rewarding and honorable profession. For those of you who

are just “recreational” process safety practitioners or users, I invite you to jump in and make a full commitment. We help companies protect people, plant assets, the planet, and shareholder value. Despite what physicists say, some of the most important things in life still happen at the chemistry level and chemical process safety is an integral part of that.

Just like recognized and generally accepted good engineering practices continue to evolve over time, process safety competencies are perishable and need to be continuously enhanced and upgraded. In that regard, AIChE through CCPS, the safety and health division, and DIERS, offers several meetings and training classes each year that can help you to sustain, enhance, and improve your process safety competencies.

Finally, I would like to close by extending my thanks to AIChE and the Safety and Health Division selection committee. I am truly humbled by this award. I would like to donate the associated monetary award to AIChE/DIERS.