

Process Safety and the Accidental Expert

Loss prevention guru Dr. Trevor Kletz taps a lifetime of knowledge to improve chemical plant safety

Dr. Trevor Kletz is a chemist turned chemical engineer turned expert on loss prevention and process safety. He started his career in research at Imperial Chemical Industries, a large British chemical manufacturer, but moved on to production management and later became the petrochemicals division's safety adviser. "I guess really you could say the career chose me, not the other way around," he explains. After Imperial Chemical Industries had several explosions in which people were killed, the company decided it could no longer leave safety in the hands of people with non-technical degrees. "Since I had an interest in safety and a technical degree, I was asked to take the post," he recalls. "I thought I'd be doing it for a few years, but I liked the job and it suited me, and I was able to improve the safety record and stayed on task until I retired." Now Kletz is a lecturer on safety at universities throughout the U.S. and England as well as the author of 11 books. He will share his expertise at ISA Expo 2006 in Houston in October, where he will discuss how proper equipment and process design can prevent accidents.

By Joy LePree

Q: Based on your experience, what is the top priority in chemical plant safety?

A: I think the most important thing is to get people to learn and remember the lessons of the past. Having been involved in process safety for many years, I've seen the same accident happen over and over, sometimes even in the same company. I still read accident reports about the same things I was writing about decades ago. It is so important to have a systematic procedure for learning from experience instead of a hit-and-miss method of safety training. Professional organizations are trying to do something, but it's really up to each industry to have a proper procedure and not just an occasional action for the formal procedure. In England, the health and safety equivalent to OSHA has sent instructions to several companies, requiring them to set up formal systems for learning from experience.

Q: How important is accident investigation to the practice of learning from our mistakes?

A: Accident investigation is actually an area where we need to improve. A lot of accident reports are technically good in that they find out what's wrong and how to put it right, but they don't uncover the underlying weaknesses in the management system. Accident reports may reveal that an accident was caused by something an operator did, such as opening the wrong valve, which caused a leak. But in reality, it's not the operator's fault. It is the fault of a bad design, and accident reports need to determine things like this. It would stress the importance to equipment designers that they ensure that simple foreseeable errors don't have serious consequences.

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One thing you can be sure of in any accident, even simple ones, is that many people had an opportunity to prevent it. The people who chose the process, the designers, the operators, the manager and so on could probably have prevented the accident, and proper accident investigation would reveal this, thus allowing us to learn from past mistakes.

Q: Is poor equipment design why it's important for chemical companies to consider inherently safer design?

A: The industry needs to emphasize inherently safer design in all aspects, not just equipment design. What I mean is that it is better to remove a hazard if you can than to keep it under control. For example, if you use a flammable solvent, yes, you can keep it under control via various methods. But the best thing is to see if you can use a safer solvent that isn't flammable or toxic. If you can't change the substance, maybe you can use less of it.

Q: We've talked about improving safety on an industry-wide basis, but how can chemical engineers help improve safety at their own plants?

A: Chemical engineers are the ones who tie all the issues we've been speaking about together at their plant. They are the ones who choose the process design, so they have a big influence on how things will be done when a company decides to create a new process. Chemical engineers should be looking for a new way to do things that might be safer versus doing it the typical way. When they look at the method of operation, they should try to find processes that have mild conditions. They should also look at the detailed design of any equipment they might select to see if it is safe and that human error won't have major consequences. Chemical engineers are actually operating the plant, so they have the power and knowledge to find the safest way to do things.

Joy LePree is a contributing writer for CHEM.INFO. She has worked as a journalist for 13 years, covering a variety of issues and trends involving chemicals, processing, engineering and maintenance.

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