



DIRECTOR'S CORNER



As we complete our 10th year of operations, it is probably appropriate to look back and review the programs and activities we have addressed over these 10 years. In creating the Mary Kay O'Connor Process Safety Center at Texas A&M University, the Board of Regents, the University administration, and the supporters of the Center gave form and substance to the opinion that the academic world must play its appropriate role for an embryonic change in process safety; both in terms of safety performance and also in terms of integration of safety in all aspects of plant operation. Of course, there were and are education, research, and extension needs that have to be fulfilled, but the most important objective that remains a continuing goal even today is a new breed of graduates and leaders. The Center mission continues to be the integration of process safety, through education, research, and service, into the education and practice of all individuals and organizations involved in chemical operations.

As I look back at the ten years of the Center operations, I can fondly talk about our accomplishments and successes. While we have been able to establish major programs on process safety, both education, as well as research, I would have to say that our single most significant accomplishment in that respect has been the adoption of process safety as a core course for the chemical engineering curriculum. Process Safety Engineering is offered every semester and since 1995, about 600 undergraduate students have taken the Process Safety Engineering course. In addition, a System Safety Certificate option is available for undergraduate engineering students. To qualify for this certificate, undergraduate engineering students have to take a combination of five safety courses within their engineering curriculum. Two of the courses are introductory safety courses, two are advanced safety courses, and the fifth course is a capstone design course.

At the graduate level, 9 PhD and 10 Masters students have completed their research and course of study at the Center. The research conducted by these PhD and Masters students has led to dissertations and theses and over 200 peer-reviewed publications, proceedings, and conference presentations. The dissertations, theses, and publications contribute to the body of knowledge to help advance the understanding of process safety issues. On the continuing education front, the Center offers a slate of courses in process safety at several sites in Houston as well as customized on-site courses. The Center has trained over 400 individuals over the last five years.

The Center has conducted and published the results of several benchmarking studies, including management of change and emergency response plan. The Center has also been a catalyst for industry forums for exchange of ideas and development of best practices. In this regard, the work on the National Chemical Safety Program has been of great benefit. Through White Papers and other forums, we have provided good science based counsel and input to regulators and other stakeholders.

In summary, I could recount a number of things that have been very rewarding and satisfying. I think if I had to name three things, I would have to say that the work with the students stands first. Right behind that is the opportunity to work with the Columbia Accident Investigation Board and the production of the 3rd edition of *Lees' Loss Prevention in the Process Industries*.

As I look towards the next ten years, I must say that a lot still remains to be done. The first thing that is near and dear to my heart is the issue of not being able to quantitatively say whether or not we are making progress in safety. Currently, there is no way of determining if we as an industry, country, or world

are getting safer. While individual companies keep data on their safety performance, there is as yet no “herd measure” of the safety performance of the industry. It’s impossible to answer the question ‘Are we doing better or worse?’ without having data, without having statistics. We produce periodic ‘report cards’ on almost everything (e.g., state of the economy, health, education, etc.) except chemical safety. This situation is really ‘scandalous.’ In 1999, the Mary Kay O’Connor Process Safety Center convened a group of experts from industry, academia, government, and environmental groups to undertake an ambitious effort called the National Chemical Safety Program. The program’s mission was to establish a rational, objective baseline by which to measure the ongoing status of national chemical safety. It culminated in the production of four reports, the crowning jewel of which was the April 2002 publication *2001 Assessment of Chemical Safety in the United States* (<http://ncsp.tamu.edu>). The report was mainly designed to establish a framework for prospective quantitative assessment. It included suggested methodologies for analyzing several existing federal databases to yield useful comprehensive information on incidents, fatalities, injuries, and other parameters, along with proposed indicators and metrics for measuring chemical safety and the results of a survey on public trust and community interaction. The report did provide some statistics as well, but they were unavoidably limited in their utility. For example, during the eight-year period examined, fatalities and injuries due to all chemicals (as opposed to specific agents or classes) had decreased. But the Center was unable to normalize its findings by correlating them to industry trends during the period.

For example the report stated that the fatalities had gone down, but there was no way of knowing if the chemical industry had increased or decreased. Despite its inherent limitations, the report did establish a baseline for future comparisons, and the intent was that the status of national chemical safety be assessed annually against that baseline. But the Center was unable to secure continued federal funding for the effort, and no one else has come forward to provide the necessary support. We are spending millions and billions of dollars on these programs on the industry side and the government side, and yet there’s no way of knowing what the health of the patient is. The fact remains that if the 1999–2000 effort established one thing, it is that the only way you can answer the question ‘What is the status of chemical safety in the United States?’ is to have statistics. Somebody has to start doing data collection and analysis every year. Only then will we know where we’re going and how fast we’re going there.”

On the academic side, universities have to do more in curriculum development. Take, for example, the US. It has about 125 major universities that have chemical engineering departments and may be around 20 of them offer process safety engineering as a course in the curriculum, but it is offered as an elective, so not everyone is required to take it. Out of the 20, may be around 5-7 of these universities require all their chemical engineering graduates to take that course. So, we still have a lot of progress to be made. The first thing that any engineer faces when they go into a plant is to deal with safety issue. Therefore, I think it is very inappropriate for universities not to be teaching process safety to their chemical engineering graduates.

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