



# DIRECTOR'S CORNER



The events of September 11, 2001, have had a profound effect on all of us. It is therefore appropriate that I address some issues that I feel are pertinent with regard to common interests as well as process safety. First, I feel that it is very important that we return to business-as-usual. This is even more important for the economy in this day and age of intertwined financial dependence. Second, the events of September 11 and later have also caused significant distraction and competition for “energy”. By competition for energy, I mean that while attention to security issues is essential, we must also continue to give the same attention to our routine and regular safety and engineering activities. Third, we need to use the aftermath of this terrible event as an opportunity for redoubling our effort for making our plants inherently safer. I firmly believe that an inherently safer plant is also a more secure plant. However, there are a number of challenges to implementing inherently safer design and concepts in existing as well as new plants.

Proposed legislation now being considered in the Senate calls for improvements in inherent safety to reduce the potential risk from terrorist activities. While improvements in inherent safety are desirable, it is likely that such efforts will require years to develop and implement and may be very costly. Consideration must also be given to existing plants and developing new technologies.

Inherently safer processes, design, and equipment are best addressed during the earlier stages of the plant's life cycle. In fact, if inherently safer issues are not addressed during the conceptual design phase and in some cases the process chemistry phase, the battle may well be lost. Thus, the challenge I want to put forth is two-fold. First, how can we incorporate inherently safer aspects in existing plants without putting industry out of business? Second, how can we make sure that inherently safer concepts are given the fullest consideration during the process chemistry and conceptual design phase for

new plants?

Often it is difficult to determine whether a proposed change to improve inherent safety will actually accomplish that goal. It is similarly difficult to determine what is the most economical method of achieving an improvement in inherent safety. For example, consider the costly retrofitting of an alkylation process in an existing refinery by substituting hydrogen fluoride for sulfuric acid. Instead, options such as addition of inhibitors to the hydrogen fluoride in addition to installation of mitigation devices such as water curtains may afford a comparable reduction of hazard potential at far less cost. Another issue is that it requires a much larger quantity (by several orders or magnitude) of sulfuric acid for the alkylation process as compared to hydrofluoric acid. Thus, by making the substitution, we are buying into other risk management issues, such as the transportation and storage of larger quantities of sulfuric acid. Whether or not the substitution of hydrogen fluoride for sulfuric acid reduces the overall risk must be determined on a case-by-case risk assessment. The risk assessment would consider specific issues relevant to the site, process, transportation routes, surrounding population, and other factors. Thus, implementing inherently safer options on existing plants may be easier said than done and must consider the entire process of manufacture, storage, transportation, and use of alternative technologies as well as the economics of such changes. Our society will be challenged to answer what level of risk do we accept and what costs are we willing to accept to achieve that level of safety?

Ensuring consideration of inherent safety during the process chemistry and conceptual design phase for new plants is somewhat different. First, the individuals involved in these phases may not be involved in the latter phases of the plant's life cycle and thus may not be aware of the potential significance of their decisions with regard to the inherent safety of the plant after it is built and in operation. Second, in many cases, it is quite

difficult to look at the process chemistry and be able to visualize what the scaled-up version of the plant would look like and thus be able to visualize the potential inherent safety problems.

During the design phase there is often too little time to thoroughly consider all alternative process schemes, materials substitutions, etc. In many cases significant and time consuming research may be required to develop inherently safer processes. Once the economic conditions exist to justify building a plant, time is of the essence. On the other hand if economic conditions do not exist for the construction of new plants for a certain product, there is little economic incentive to pursue such research and development.

Other changes toward inherent safety may also require changes in the industries infrastructure to process, transport, store, and use substitute materials or processes.

Given the uncertain economics and long-term nature of these challenges, it may be appropriate for government agencies and industry groups to sponsor research and development of inherently safer designs for new and existing processes. Priority research areas could be determined with a risk-based analysis based on information such as the worst case scenarios in the EPA RMP.

Fianlly, I want to address the dangers associated with making risk information widely available. Arguments have been made that this type of risk information could be used for evil purposes. That argument may very well carry the day given the current national mood and circumstances. Improvements in chemical safety are dependent on many factors, some of them quite complex. One of these factors, I believe is public trust. The more the public trusts the government and the industry, the greater the community interaction, which I believe fosters dialogue for inherent safety and emergency preparedness, the net effect being contributions to safety improvements.

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