Incorporating Inherently Safer Design Practices in Process Hazard Analysis

David A. Moore, PE, CSP
President
AcuTech Consulting, Inc.
100 Pine Street, Suite 2240
San Francisco, CA 94111

ABSTRACT

Inherently safer design concepts are particularly useful for risk reduction and are highly recognized and recommended by safety professionals as a first choice in process design practices. These concepts can be easily applied, particularly in the design phase of a process, and may have very powerful benefits at relatively low cost. In the practice of engineering new or modified processes, however, these concepts are often not incorporated in a structured manner. Without knowledge or insight of these concepts, engineers may be retaining unnecessary risk or employing less reliable and more expensive alternatives to reducing risk.

Due to regulatory requirements to conduct process hazard analyses, such as OSHA's Process Safety Management standard (29 CFR 1910.119) and EPA's Risk Management Planning regulation (40 CFR Part 68), process hazard analysis reviews are being conducted more than ever. There is a requirement in these regulations to also establish and maintain a baseline risk understanding by retroactively evaluating existing processes. With all of this effort being expended, a major opportunity to improve process safety of U.S. businesses may be lost if teams are not well informed and prepared for the job.

There may be several explanations for the claim that inherently safer design practices are not being used to maximum advantage: These may include factors such as the lack of standardized approaches to commonly applied process hazard analysis studies, the lack of a recognized method for incorporating inherently safer design issues into the process safety management process, and the lack of experience and knowledge of many of the teams who are applying these approaches. Several trends have emerged over the past 5-7 years; 1) thousands of engineers inexperienced in many of the principles of process safety and inherently safer design are conducting or participating in studies, 2) For many companies, particularly medium to smaller ones, they do not conduct any other type of formal safety design review.

Clearly there is room for improvement and a simple, yet effective approach is needed that can be well recognized, accepted and practiced by a wide spectrum of industrial companies. Incorporating these concepts into process hazard analysis studies ensures that they are considered and is more efficient than conducting a separate review. As such, they are more likely to actually be used.

The paper will explore these issues, and recommended ways to incorporate concepts into process hazard analysis. Key concepts of inherently safer design will be outlined. These methods can then be adopted by industry as part of a process hazard analysis, and can benefit them by reducing risk more effectively and easily.