

Director's Corner



“The point of investigation is not to find where people went wrong, it is to understand why their assessments and actions seemed right at the time,” the Australian safety scientist, Sidney Dekker, makes this keen observation in his book on human error. Safety performance has been challenged by the complexities of the interaction between the people, the process and the environment, but the research and application of Human Factors’ principles have provided an opportunity to alleviate some of these challenges.

In the director’s corner in the spring 2015 *Centerline*, I raised the importance of leaders in developing and implementing effective process safety programs. A key point of influence is the organizational culture, which is again significantly influenced by the human element of the organization, making leadership an outcome of recognizing the importance of the human element in achieving excellence in process safety performance.

Process safety management over the past decades has focused on and achieved considerable success in developing and deploying safety barriers, hazard and risk assessment and alleviating many of the technical challenges associated with the process safety. A central element of many of these challenges has been the “human element,” which plays a critical role in achieving operational excellence. Recently, regulatory and industry standards organizations have also recognized the significance of issues related to humans. Cal-OSHA in its recently revised regulatory requirements has introduced ‘Human Factors’ as one of the items to be considered under process hazard analysis. API has Human Factors subjects in its recommended practices such as API RP 754, which tackles issues related to fatigue management and API RP 75 which has Human Factors considerations for safety management systems in the offshore domain. Although these provide, a direction to the industry, challenges remain on how to operationalize many of these guidelines. Without a clear “*cause-effect*” relationship established through a combination of fundamental and empirical research, there continues to be lack of clarity on how many of the actions translate into an improvement in safety performance.

The challenges with the human elements have manifested in several incidents and in some cases have exacerbated the severity of consequences, which have amplified the significance for further investigations into Human Factors Engineering. The Baker panel report recommended the development of guidelines on operator fatigue after the Texas City incident. Even after having engineering barriers such as safety interlocks, many incidents continue to emphasize the need to address challenges with Human Factors at the design and engineering stage, as well as during operations.

Although traditionally assumed to be associated with a behavioral and cultural challenge, the science and principles of Human Factors has broad applicability in design, construction and technical barriers; by ensuring that barriers consider not only *how* the risk is mitigated but also how the mitigation is *designed* and *who* is responsible for the action. Human Factors research covers a wide variety of subjects including fatigue, alarm management, interface design, procedures, crew resource management, human machine interaction, human-centric design, and other topics, which influence the human interaction in the process. It must be recognized that measuring and improving human performance is not the same as understanding and improving human-system integration through Human Factors Engineering. While both ultimately impact safety performance, focusing on “human performance” places an inherent emphasis on improving the performance of the human by methods such as training and behavioral programs. On the other hand, taking a “Human Factors approach” allows us to concentrate on human-centric design and operations, thus reducing error-

likely situations.

Research in Human Factors and the explicit implementation of the learnings into both the design and operation of facilities offer an opportunity to engineer the human into the process. The increase in automation alongside, the highly-instrumented processes have brought to the fore unprecedented complexities and issues such as alarm overload, lack of situation awareness, which have presented the need for innovative solutions to alleviate the risk presented by these complexities.

At the Center we have started to take up some of these challenges to understand the underlying science of subjects such as the writing and management of procedures, and tackling issues of fatigue in offshore personnel using a combination of laboratory-based and field-based empirical research. This is in addition to research in safety culture and risk assessment in collaboration with the multiple disciplines.

It needs to be recognized that Human Factors inherently requires a multi-disciplinary approach since it requires in-depth understanding of the consequences of a safety upset from the technical perspective and the human interactions with the entire system. This requires a concerted effort from the experts from both academia and industry to establish common language and standardization of guidelines based on research, which can positively impact safety performance.

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MKOPSC Collaboration with Chemical Processing for Webinar Series on Process Safety Topics

The Mary Kay O'Connor Process Safety Center, in collaboration with **Chemical Processing**, has been hosting a webinar series on Process Safety topics of interest to the chemical process industry. The 2017 webinar series titled, "**Our Quest to Improve Process Safety Performance in the Chemical Process Industries**," features four one-hour webinars including a live Q&A session. The four webinars in the 2017 series are:

- Leadership in Process Safety (February 16, 2017)
- Enforcement and Operational Discipline (April 18, 2017)
- Process Safety Competence (June 15, 2017)
- Failure to Learn (August, 17, 2017)

These webinars are available on-demand on the **Chemical Processing** website (<http://info.chemicalprocessing.com/chemical-processing-webinars>). Below is the short abstract of the Process Safety Competence webinar followed by answers to the questions by the participants that could not be covered during the webinar.

Process Safety Competence

Every post-incident investigation has revealed that competency in executing certain process safety tasks led to the incident directly or contributed to the severity of consequences. As a result, it is imperative that competence should be a basic pillar on which improvements in process safety performance should be built. Requirements for achieving and maintaining competence for various activities should be spelled out very clearly. Process safety competence and performance should also be recognized and compensated properly. However, best-in-class organizations also recognize that performance management tools must be used with great care in the field of safety. The