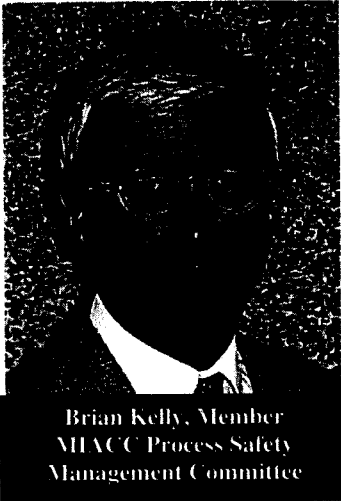


Process Safety Management in Canada

By Brian Kelly, Syncrude Canada and Member of MIACC's PSM Committee



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Process safety deals with the potential release of hazardous chemical substances, which might result in fires, explosions and toxic effects to people and the environment. Most process incidents, however small, can escalate into large-scale releases with devastating consequences unless preventive and responsive measures are planned and pursued early. During the past decade alone, process accidents have been responsible for hundreds of injuries and fatalities in North America as well as billions of dollars in property damage and lost profits. With the trend towards larger plants and higher output, large-scale process accidents are far more likely today than previously. In fact, over 80% of the largest 50 industrial accidents worldwide have occurred since 1977. Equipment failure or rupture, which results from procedural error, metallurgy failure, or equipment malfunction, typically precedes large-scale releases. A complete understanding of a process is therefore required to

ensure that large-scale process accidents cannot or will not occur.

The risk of releasing large quantities of hazardous substances also exists in the commercial and public sectors. Hazardous chemicals and other consumer goods are commonly transported on public highways, railways and waterways. Bulk storage of hazardous goods is sometimes located in close proximity to populated communities. Regardless of the source, an unexpected release of any hazardous material can result in severe consequences. Appropriate safe work practices and emergency procedures are required to ensure public safety.

Process safety management (PSM) is a systematic approach to minimizing process incidents. Introduced in the mid-80s in many highly industrialized countries, PSM was in direct response to a number of catastrophic losses, which made headlines worldwide. Unlike conventional safety programs, which focus on human behavior, process safety management addresses the basic culture, which is essential for safe and reliable process operations. Today, regulations exist in the U.S. which require chemical process operations (oil, refineries, chemical plants, bulk storage facilities) to have active programs addressing codes and standards, process hazards, safe operating procedures, personnel training, risk assessment, management of change, equipment integrity

and process information management. Since this legislation was introduced in 1991, there has been a marked reduction in process incidents particularly in the U.S. Gulf Coast Region. This is largely attributed to the success of process safety management.

Process safety management provides significant benefits to any organization involved in the handling, transportation, processing, storage or disposal of hazardous materials. It develops a fundamental understanding of how chemical substances behave under normal and abnormal circumstances. It provides a framework for addressing critical activities, which can result in more reliable and predictable business operations with fewer losses. Other direct benefits include fewer leaks, fewer production upsets and improved up time. Process safety management ultimately addresses the safety and well being of workers and members of the community at large.

The most important ingredients of any PSM program are commitment and accountability. Commitment requires a senior person in charge to publicly declare that a business will follow certain principles. Commitment must begin at the conceptual stage of any new plant, facility or scheme to handle hazardous materials. Accountability establishes specific responsibility for actions arising out of the PSM commitment. For example, chemical properties,

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Brian Kelly is a long-standing member of the MIACC Process Safety Management Committee. He has written numerous articles on the subject.

The implementation of the 12 principles of PSM at all facilities that handle hazardous substances, is one of the actions currently being promoted under MIACC's *Partnerships Toward Safer Communities Initiative*.

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inventories and conditions must be carefully reviewed, challenged and appropriate measures put in place to ensure against their accidental release. Once a facility is operating, personnel must be trained to deal with normal and upset conditions, and accurate records of inventories, conditions, and significant operating deviations must be kept. Over time, a knowledge culture should evolve which will

better prepare workers and emergency responders to deal with undesirable events.

In Canada, PSM exists as a co-operative venture and is largely based on successful examples elsewhere and the belief that it adds value. Several organizations, such as MIACC (Major Industrial Accidents Council of Canada), sponsor workshops and provide technical assistance in implementing PSM programs. While there is no formal PSM

legislation, all corporations and communities are expected to demonstrate both the knowledge and practice of good process safety management.

If your company or organization has not already embarked on such a program, you are urged to contact a participating member of MIACC or Responsible Care for direction and possible assistance.

Evaluating How Hazardous Sites are Managing Risks (cont'd)

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various situations commonly found at the respective sector's sites.

Rob Cairns, Co-chair of the MIACC PSM Committee states, *"Although it was first developed to integrate process safety into the management of an organization that handles hazardous substances, the principles of PSM can be applied to virtually any industry or process."*

To help hazardous installations measure the effectiveness of their current PPR activities, it made sense to use PSM as the basis for a self-assessment tool. To do so, the 12 principles were broken into three levels to match those of the community status levels—Essential, Enhanced and Excellent. The Essential Level contains all the actions that if not undertaken have the potential to result in a serious release of hazardous substances or initiate a reaction of dire consequences. The Enhanced level involves those actions that ensure that subsequent actions based on

the earlier decisions will not result in a release of hazardous substances. And the Excellent level includes those actions that reduce the potential severity or likelihood of major industrial accidents by substituting site factors such as input substances or tank sizes; or by supporting process safety through the integration of the principles into an organization's management philosophy.

Later this year, all tracked hazardous installations will be sent the Site Self-assessment Tool. The results will help indicate what actions are currently being taken by industry and identify where MIACC partners need to increase awareness; provide technical assistance, training and tools; or to further enhance community preparedness levels.

Summary information on the levels attained across industry sectors will be provided in MIACC's future annual PPR Status Reports. This will help community stakeholders increase the knowledge of PPR

practices by their local industry sites as well as to support the process of determining risk and risk acceptability levels.

To find out more about when the Site Self-assessment Tool will arrive, how information will be handled or to get assistance in completing the Site Self-assessment Tool, site representatives can contact one of the members of the MIACC Process Safety Management Committee. Regional-specific contacts are listed in the instructions that come with the self-assessment tool.

These individuals have also agreed to respond to queries from industry representatives who want to implement PSM at their site. Simply completing the tool will help site personnel understand that Process Safety Management is not substantially different from many loss control programs currently being used. It will also help demonstrate some of the benefits and value of implementing PSM at their facility.

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