Canadian Society for Chemical Engineering | ***For Our Future***
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Your reference: RDIMS # 9128127

March 26, 2014

Captain Gordon Houston, Chair
Tanker Safety Panel Secretariat
tsep-cesnc@tc.gc.ca

Re: Invitation to submit input to Phase II of the Tanker Safety Expert Panel Review

Dear Captain Houston

Dr. David Fung, Chair of the Chemical Institute of Canada, has referred your letter of January 29, 2014 to the Process Safety Management Division of the Canadian Society for Chemical Engineering (CSChE) for response. The CSChE is Canada's professional society for chemical engineers, and along with the Canadian Society for Chemistry and the Canadian Society for Chemical Technology, is a constituent society of the Chemical Institute of Canada. This response may be made public in its entirety.

Process Safety Management (PSM) is the application of management principles and systems to the identification, understanding and control of process hazards to prevent process-related injuries and incidents. PSM was developed after lessons from several major accidents showed that such events can be difficult to prevent using traditional approaches. Many of the key decisions which lead to serious, unplanned events are beyond the control of the operator or even local site management. Effective control, therefore, calls for a much broader review of the process, including equipment, procedural and organizational factors, together with a management system to ensure all hazards thus identified are properly managed throughout the life of the process, regardless of changes in personnel, organization or **operating environment**.

The PSM Division is focused on the prevention of major industrial accidents, including the encouragement of a public policy framework that incorporates sound PSM principles. Given the focus of the PSM Division we are going to focus our response on prevention matters, rather than the bulk of your questions concerning preparedness and response. However, this should not be taken as having a negative view on the importance of having an adequate preparedness and response presence that can quickly respond to the worst credible event, especially in a fragile environment such as the arctic.

We have developed a PSM Standard, which is applicable to the production, handling and use of hazardous and noxious substances. The overarching purpose of this Standard is to identify the performance requirements that can be audited by an organization or a third party to recognize and address gaps that may exist in the overall management system. This Standard identifies the various policies, practices and procedures that will help to ensure the organization achieves the desired results; however, it is not the intent of this Standard to lay out prescriptive solutions that will meet the needs of every organization. Each facility is unique and the user of this Standard will find that a particular policy, practice or procedure that is effective at one operation or site may need to be modified or rewritten for it to be fully effective at another.

A copy of the standard is attached. While copyrighted by the CSChE, it can be downloaded without charge from the PSM Division webpage, along with the accompanying PSM Standard Audit Guide as well as an audit workbook.

Also available from the website is the 4th edition of the PSM guide, which shows the scope of PSM and explains briefly the meaning of its elements and components.

In response to the Panel's Lines of Inquiry, we have provided answers to the first 5 questions addressing Coverage and Prevention, as follows:

1. **How should HNS be defined for the purposes of a Canadian ship-source incident preparedness and response regime?**

   The PSM Subject Division supports the statement in the International Maritime Organization's HNS Convention Overview that "HNS include both bulk cargoes and packaged goods. Bulk cargoes can be solids, liquids including oils, or liquefied gases. The number of substances included is very large: the IMDG Code, for example, lists hundreds of materials which can be dangerous when shipped in packaged form. Some bulk solids such as coal and iron ore are excluded."

2. **What types of substances should be included in a Canadian regime for HNS? What is the rationale for their inclusion? What criteria should be used to inform the future inclusion of additional substances?**

As a starting point, the types of substances that might be considered for a Canadian regime could include those listed in the Environmental Emergency Regulations in section 200 of Part 8 of the Canadian Environmental Protection Act (CEPA), 1999. A second alternative might be the regulatory list under the Transportation of Dangerous Goods Act (TDGA). As the Panel is no doubt aware, these are divided into 9 classes according to the type of hazard they present. Some of these are further divided into divisions due to the nature and characteristics of the substances involved. A third option might be some combination of these two lists.

For CEPA s200, substances are included because they are: likely to explode, hazardous when inhaled or present other hazards. Under the TDGA, the 9 classes cover explosives, gases, flammable liquids, flammable solids, oxidizing substances, toxic and infectious substances, radioactive materials, corrosive substances and miscellaneous hazardous products.

3. **Should a regime address HNS transported in bulk or in packaged form (e.g. containers) or one or the other? Why?**

   The PSM Division supports the inclusion of both bulk and packaged forms of HNS in the scope of application. This is in keeping with the definition taken from the interpretation given in the IMO's own documentation on the HNS Convention cited above.

4. **What measures are already undertaken, either by government or industry, to prevent ship-source HNS incidents?**

   There are a number of measures already in place to prevent or minimize marine spills in Canada. These include regulatory oversight that encompasses design and construction provisions such as double-hulling of vessels, inspections including aerial surveillance and enforcement.

   The Emergencies Prevention, Preparedness and Response Working Group of the Arctic Council, in which Canada participates, has also done a great deal of work addressing the issue of Arctic spills. The focus is on what the 8 circumpolar countries can do to prevent, prepare for and respond to oil and gas spills into this particularly harsh and remote environment. These same principles could be applied to the proper management of HNS as well. Canada has also undertaken research in oil recovery methods.

Risk assessment processes, such as TERMPOL, play an important part in evaluating the probability of spills at oil handling facilities across Canada. Recent applications of this methodology have included Enbridge's Northern Gateway project and various LNG terminal proposals. Ship to shore (or vice versa) transfers of oil and gas products pose a significant threat that must be assessed and managed appropriately.

5. **What additional measures should be taken to reduce the risk of a ship-source HNS incident?**

   As stated above, our group's focus is Process Safety Management. We recommend that the principles of the PSM Standard be incorporated in any overall requirements your Task Force recommends for the prevention of ship-source accidents and accidental releases.

We would also recommend that shippers should be required to develop worst case scenarios with respect to the hazardous and noxious substances they transport and develop response plans for them.

We hope you will find this helpful.

Sincerely

Adrian J. Pierorazio, P.Eng.
Vice Chair
CSChE PSM Division

c.c. David Fung, CIC Chair
David Guss, CSChE President