

Presentation to the Canadian Society for Chemical
Engineering
Process Safety Management Division
Symposium
Calgary October 3 – 6, 2004

*CSChE-PSM Summer
Institute for Canadian
Chemical Engineering
Professors*

by

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HISTORY

A brief history as to why this event was felt to be necessary. The answer goes back to MIACC (Major Industrial Accidents Council of Canada) and specifically the technical management committee. This committee was made up of many of Canada's experts in the field of Process Safety Management (PSM). The advancement of PSM in industry pointed to the need to include an impact in the educational area. The demise of MIACC in 1999 saw this initiative along with others disappear, but only temporarily. The members of the technical management committee maintained their commitment and were able to resurface as the PSM Division of the CSChE. Impacting university engineering education became one of the committee objectives and through the Division's Education Team came up with the specific goal to put on a program much like what is provided by the AIChE SACHE group in the US. However, as this US particular program is not available to people from outside the country Canada really needed it's own.

I should mention that four other parties interested in pursuing this program, and represented on our committee. One being the Minerva organization, which develops case studies for Business and Engineering schools on the topics of risk management and other subjects related to the management of Health and Safety. Minerva was also a major fundraiser. As well, the Departments of Chemical Engineering from Dalhousie University and the Université de Sherbrooke. And the Industrial Safety and Loss Management Program at the University of Alberta, Faculty of Engineering.

The PSM Division Education Team met with the chairs of the Canadian chemical engineering programs in Vancouver in 2002 to test the waters and again introduced the concept at the 2003 CSChE conference in Hamilton. All were supportive. Giving the committee the go ahead to continue to pursue putting on the program.

PLAN

Our initial plan has always been to make the program available to one professor from each university in Canada at no cost to them. This way we would make contact across the country. This meant a budget of about \$47,000.00 (of which we spent ~\$42,000.00) and the monetary support would come from industry and government. We did share the proposed program with the CSChE's annual conference in Hamilton (Oct. 2003). There the audience provided valuable input and support. Armed with the program, direct contact with the 20 chemical engineering programs across Canada was made soliciting attendees. Some selling of the idea was needed but in the end 19 of the 20 programs plus one industrial program committed to having one representative attend. An overwhelming response! Our funding and budget managed at the end to support having two professors from five of the universities attend because of their interest.

Having gone down the road of organizing conferences and gathering funding before, we were somewhat cautious. Our original goal was to hold the first Summer Institute in 2005. But as the fundraising effort was showing much promise we set a “drop dead” date for holding the institute as the end of January 2004. We easily met that date and proceeded to make the commitments for May 30 – June 2, 2004.

Thanks to our supporters, for stepping up to the plate as they did. The idea of having safety and loss management taught in engineering schools is obviously important to them.

We wanted to give a real industrial flavour to the Institute and chose Sarnia as the location for the “First Summer Institute”. For many reasons it was the best choice. Centrally located in Canada, close to many of the universities meant lower travel costs, and being heavily industrial has many, many different chemical processes to see. The strong support from Nova, Lanxess (Bayer) and Imperial Oil who volunteered to host the sessions meant managing the logistics and time was made easier by holding it in Sarnia.

OUR COSTS

The budget included all costs for professors and a few of the organizing committee members to attend. These costs included travel (plane & personal car) plus hotel, meals, bus transportation and a rather thick binder of information including a CD of all presentations. Also included was an evening dinner on the St. Clair River with Scott Munro of the Sarnia Lambton Environmental Assoc. discussing the environmental component of loss management.

THE PROGRAM

Each session consisted of several presentations followed by a break out of the professors into 4 teams to discuss ways of implementing the content into courses in general. The team outcomes were then shared with all professors. This provided a valuable sharing of ideas and priorities for our committee to work on towards meeting the specific needs of the professors.

Each day’s program was evaluated by each professor and input given to our organizing committee for next time. A final evaluation was conducted using a survey adapted from a questionnaire used by industry to measure their awareness and use of the twelve PSM principles. The purpose was to measure where each university stood opposite implementing the topic into their programs. It was not unexpected that their evaluations showed they had a long way to go. But it gives us a baseline to monitor change. As well a specific survey of each schools progress in detail is planned. Both of these tools will help us to continue to be helpful in a positive way. We now believe we are well-positioned and able to assist impacting university chemical engineering curricula in the future. Our connections include most of those original MIACC Technical Management Committee people in the process too as resources.

SUMMER INSTITUTE – 2005

Our next Summer Institute planning is underway with a similar date in 2005. The program will once again focus on the chemical engineering programs to solidify our connection and strengthen curricula content and we will consider branching to other engineering disciplines for 2006. Right now we are proceeding with caution to protect and build on the success we saw in Sarnia this year.

And we need funding. Again thanks to those companies who supported our first program and hopefully we have reported it as a successful investment for them. Hopefully they will find supporting this venture again will help to meet their own company goals. This is a long-term program we know will have valuable impact on companies and Canadian industrial performance into the future. Our request for support also means involvement of industry with university programs. Lecturers, site visits, case studies, program involvement are some of what we see being important to our program's success.

To those other companies who did not support our program we would like to extend an opportunity to get involved as well. We will be shortly making our plans for 2005 known and will include several items to see around our program success in 2004. Hopefully this will influence other companies to take part and we would appreciate that. If you have any questions feel free to contact any of the organizing committee.

SUMMARY

As you can see we have enjoyed success. We see a need for more and the need for broader involvement. The safety and loss management knowledge already developed is extensive. To have that knowledge presented to undergraduate students is our challenge and a large challenge it is. It is a long-term program we are embarking on and we will need long-term financial support.

Our committee is one that brings together industry with the existing programs provided at Dalhousie and the University of Alberta, along with the Minerva program, CCPA and CChE. We believe we have the knowledge in place to continue a very effective program.

If successful we will plan to continue our relationship with the various Faculties in order to help them to develop the content they need for their specific programs. Each university is different and will need special assistance. And if successful we will be looking for future funding as well. For now the institute plan is our starting point, one we hope will be an annual function. We look forward to your support.

Funding Supporters

BASF

Canadian Chemical Producers' Association

Canadian Society for Chemical Engineering

Chemical Education Trust Fund

(Chemical Institute of Canada)

Dow Chemical Co.

Environment Canada

Health Canada

Imperial Oil Ltd.

Interquisa Canada s.e.c.

Irving Oil Ltd.

LANXESS Inc. (formerly Bayer Inc.)

Minerva Canada Inc.

NOVA Chemicals Corp.

Recochem Inc.

Royal Polymers

Suncor Energy Inc.

Workplace Safety & Insurance Board of Ontario

Doug McCutcheon, P. Eng.

(Summer Institute Committee Chairman)

Professor and Program Director

Industrial Safety and Loss Management Program

Faculty of Engineering

University of Alberta

Summer Institute 2004 Program

2004 CScE Summer Institute Agenda

Rev Date: 3-May-04

Location: Sarnia, Ontario

Institute Overall Objectives and Conditions:

- 1 Industry and universities to help each other with respect to ultimately improving safety & loss management in the industrial workplace
- 2 Professors to gain knowledge on what to teach, how to incorporate topics into curriculum and what resources are available
- 3 Industry to gain knowledge on how to assist Universities with respect to resources and support
- 4 Establish a follow-up program to provide continuing support of implementing topics into curriculum
- 5 As a condition for participation, Universities to commit to a strategy on how to implement EHS topics into curriculum

Item	Activity	Who	Time	Duration (hr:min)	Status/ Comments
1.0	Sunday, October 26, 2003				
1.1	Issue Steve Coe's Process Safety Management (PSM) Questionnaire to Chairs of Chemical Engineering Departments to survey what is and what is not taught at the universities. This will be used by the professors as a reference point when they do the workshop sessions at the summer institute. Instruct professors to bring completed survey to summer institute.	Steve Coe and Paul Amyotte			
2.0	Sunday, May 30, 2004				
	Location: Hotel				
2.1	Register and refreshments (cmte to man and set up)		4:30 PM	1:00	
2.2	Supper		5:30 PM	1:30	
2.3	Introduction	Doug McCutcheon Professor U. of Alberta	7:00 PM	0:15	

2.4	<p>Presentation on</p> <ul style="list-style-type: none"> a) Reason/ objectives for Summer Institute (How We Got To This Point) b) Focus for Institute -i.e., Env, Health, Occupational Safety, Process Safety Technology, Process Safety & Loss Management (PSLM) c) Expectations After This Institute (see comments) d) Future Expectations for Institute (wrt content, deliver, funding, etc) <p>Include discussion on how questionnaire may be used in sessions. Explain that this is an introductory session or starting point. Future institutes can expand more in-depth on specific topics.</p>	<p>Doug McCutcheon Professor U. of Alberta</p>	7:15 PM	0:30	<p>Expectations After the Institute: Professors to prepare specific path forward or plan for possible implementation at their own universities and then to report back to the Summer Institute within one month after the institute. The Summer Institute via Minerva to contact the professors for a status update and to offer ongoing support.</p>
2.0	Sunday, May 30, 2004 (Continued)				
2.5	<p>Presentation on Industry Needs for Institute</p> <ul style="list-style-type: none"> a) Improvement in new grads knowledge wrt Responsible Care, Env, Health, Occupational Safety, Process Safety, PSM, Loss Management Why? <ul style="list-style-type: none"> i) leads to improve safety performance ii) enhance safety culture in industry iii) improves ease of introduction of new employee into professional work life iv) benefits new employee's career progression b) Make universities appreciate need to do item (a) c) Encourage universities to take on research in improved processes & tools 	<p>Jan Windhorst Process Safety Specialist NOVA Chemicals</p>	7:45 PM	0:45	
2.6	<p>Team development activity & organize teams (see item 1.30 in "Upfront Planning")</p>	<p>Daneve McAffer Principal & Owner Freeborn & Associates Consulting</p>	8:30 PM	1:00	

2.7	Conclusion of team development session	Doug McCutcheon Professor U. of Alberta	9:30 PM		
3.0	Monday, May 31, 2004				
3.1	Bus leaves hotel to Institute Location		7:00 AM	0:30	
3.2	Arrive at Location: NOVA Corunna Site, Beckwith Rooms 1 & 2 Continental Breakfast Break Out Rooms: Ascot & Belmont Rooms at 2nd Floor Mtce Bldg; Lexington Room at 2nd Floor East Admin Bldg	Manny Marta (Host) Process Safety Engineer NOVA Chemicals	7:30 AM	0:30	
3.3	Safety Rules	Manny Marta Process Safety Engineer NOVA Chemicals	8:00 AM	0:10	
3.4	Introduction (including going over activities for next 3 days & reason for summer institute)	Paul Amyotte Professor Dalhousie U.	8:10 AM	0:30	Include Westray information & Bill C-45 - Amendments to Criminal Code Affecting the Criminal Liability of Organizations
3.5	Opening Speech: NOVA Corporate Executive	Tom Strifler Site Manager NOVA Chemicals	8:40 AM	0:15	
3.6	Presentation by Student or New Grad on his/ her industrial experience and why teaching certain things in university can improve things	Jeff Harris Process Design Engineer NOVA Chemicals	8:55 AM	0:30	
3.7	Break		9:25 AM	0:15	

3.0 Monday, May 31, 2004 (Continued)					
3.8	<p>Presentation on University Needs</p> <p>a) We Know Some Things But We Want to Understand Better and More Completely - i.e., the Big Picture</p> <p>b) Want to Appreciate Societal Pressures:</p> <ul style="list-style-type: none"> - public outrage/ concerns - environmental protection - sustainable development - regulations - CCPE Accreditation Board requirements <p>c) Want to Understand Better and More Completely Definitions and Concepts</p> <p>d) Want to understand how we can teach the topics (this will be the common question for the workshops)</p>	<p>John Shaw Professor (U of Alberta)</p>	9:40 AM	0:30	
3.9	<p>Presentation on Process Safety Management Educational Module (PSM)</p>	<p>Graham Creedy Senior Manager Responsible Care CCPA</p>	10:10 AM	1:00	
3.10	<p>Lunch on site (Piper Alpha Video)</p>	<p>Paul Amyotte Professor Dalhousie U.</p>	11:10 AM	0:45	
3.0 Monday, May 31, 2004 (Continued)					
3.11	<p>Presentation on Process Safety Management (PSM) elements (presentations to include available resource information)</p> <p>When time comes to explaining the Process Risk Management element include information on:</p> <ul style="list-style-type: none"> a) hazard identification/ reviews b) Consequence effects analyses c) Inherently safer design principles d) Layers of protection analysis & SIS's e) Definition of risk and risk concepts <p>Do Accountability element at the end.</p>	<p>Steve Coe Process Safety Engineer Irving Oil Limited</p>	11:55 AM	1:15	Incorporate Steve's PSM survey results into presentation

3.12	Workshop # 1: Question: After seeing presentations so far (yesterday & today), how can universities incorporate topics into curriculum? Include discussion on information resources needed and available; teaching strategy, etc (Team presentations at end: 4 @ 5 minutes each - typical for all workshops)	Manny Marta Process Safety Engineer NOVA Chemicals	1:10 PM	1:30	Use flipcharts for presentations
3.13	Break & Bus tour of NOVA Chemicals Corunna Site (organize tour to maximize "showing" how various PSLM elements are applied in industry)		2:40 PM	2:30	
3.14	Bus back to hotel		5:10 PM	0:30	
3.15	Arrive at hotel; Rest at Hotel		5:40 PM	0:45	
3.16	Bus Leaves To Dock for River Cruise		6:25 PM	0:10	
3.17	Arrive at boat and board		6:35 PM	0:10	
3.18	River Cruise (focused on environmental protection) - Narration on Chemical Valley Environmental Improvement Efforts - Supper	Scott Munro Manager Sarnia Lambton Environmental Association 332-2010	6:45 PM	2:00	Rob, Lyle, Manny - ideas on what to include and suggest to Scott (e.g., recent spills attention)
3.19	Bus back to hotel		8:45 PM	0:10	
3.20	Arrive at hotel		8:55 PM		
4.0	Tuesday, June 1, 2004				
4.1	Bus leaves hotel to Institute Location		7:00 AM	0:30	
4.2	Arrive at Location: Bayer Bayer Research & Development Vidal Street South (East Side) Near Cabot Carbon Continental Breakfast (need to determine safety orientation requirements)	Rob Cairns (Host) Process Safety Engineer Bayer	7:30 AM	0:30	
4.3	Opening Remarks by Bayer Senior VP - Importance of PSLM knowledge for new grads	Bayer Senior VP	8:00 AM	0:10	
4.4	Workshop # 2: Question: After last night's river cruise, how can universities incorporate topics into curriculum? Include discussion on information resources needed and available; teaching strategy, etc	Rob Cairns Process Safety Engineer Bayer	8:10 AM	1:30	

4.5	Presentation on Major Accidents and Lessons Learned (including resources available)	Rob Cairns Process Safety Engineer Bayer	9:40 AM	1:00	
4.6	Responsible Care	Graham Creedy Senior Manager Responsible Care CCPA	10:40 AM	0:45	
4.7	Presentation on DOW Fire & Explosion Index (including resources available)	Steve Coe Process Safety Engineer Irving Oil Limited	11:25 AM	1:00	
4.8	Lunch on site (Video on Inherent Safety)	Paul Amyotte Professor Dalhousie U.	12:25 PM	0:45	
4.0	Tuesday, June 1, 2004 (Continued)				
4.9	Presentation on toxic releases and US EPA Risk Management Plan, DOW Chemical Exposure Index	Doug McCutcheon Professor U. of Alberta	1:10 PM	1:00	
4.10	Introduce Question for tonight's workshop (homework question): After seeing today's presentation and tour of Bayer, how can universities incorporate topics into curriculum? Include discussion on information resources needed and available; teaching strategy, etc.	Rob Cairns Process Safety Engineer Bayer	2:10 PM	0:15	
4.11	Break & tour of Bayer facility. Focus on facilities with toxic materials and how prevention, preparedness and response have been taken into account.	Rob Cairns Process Safety Engineer Bayer	2:25 PM	2:30	
4.12	Bus back to hotel		4:55 PM	0:15	
4.13	Arrive at hotel & rest		5:10 PM	1:00	
4.14	Supper		6:10 PM	1:30	
4.15	Workshop # 3 at hotel		7:40 PM	1:30	
4.16	End of workshop		9:10 PM		
5.0	Wednesday, June 2, 2004				
5.1	Bus leaves hotel to Institute Location		7:00 AM	0:30	

5.2	Arrive at Location: Imperial Oil Limited Imperial Oil Research Building Christina Street (between Confederation and Clifford) Training Rooms 1 & 2 (3rd floor) Continental Breakfast	Dave Beer (Host) Site Leader for Health, Safety, Security & ER Imperial Oil	7:30 AM	0:30	
5.3	Welcoming and opening remarks by IOL Executive Introduction to Imperial Oil Operations Integrity Management Framework	Steve Griffiths Petrochemicals VP and GM Imperial Oil	8:00 AM	0:30	
5.4	Presentation on IOL Occupational Health and Personnel Safety Program - "Nobody Gets Hurt"	Tony Pasteris P&C Operations Integrity Manager Imperial Oil	8:30 AM	0:45	
5.5	Presentation on Equipment Overpressure Protection	Don McKessock Site Senior Technical Advisor Imperial Oil	9:15 AM	0:30	
5.6	Break		9:45 AM	0:15	
5.7	Presentation on Human Factors in Plant Design (by IOL Corp. Safety Program Manager) and Behaviour Based Safety (By Site Safety Advisor)	Eric Bristow (Safety Program Manager) Imperial Oil Rob Menzies (Site Safety Advisor) Imperial Oil	10:00 AM	0:45	
5.8	Presentation on Emergency Response Facilities Design Considerations (by IOL P&C Senior Operations Integrity Advisor) and Emergency Preparedness (by Site Health, Safety, Security & ER Leader)	Syed Ahmed (Senior Operations Integrity Advisor) Imperial Oil Dave Beer (Site Health, Safety, Security, ER Leader) Imperial Oil	10:45 AM	0:45	

5.9	Lunch on site (Fires & Explosions Video)	Manny Marta	11:30 AM	0:45	
5.0	Wednesday, June 2, 2004 (Continued)				
5.10	Workshop # 4: After seeing today's presentation, how can universities incorporate topics into curriculum? Include discussion on information resources needed and available; teaching strategy, etc.	IOL Facilitators Syed Ahmed Dave Beer	12:15 PM	1:00	
5.11	Summarize the 3 days	Doug McCutcheon Professor U. of Alberta	1:15 PM	0:20	
5.12	Open discussion around the summary		1:35 PM	0:25	
5.13	Complete PSM Survey		2:00 PM	0:30	
5.14	Feedback & Discussion: surveys, how to improve next institute; what should be the future for the institute; summarize next steps	Doug McCutcheon Steve Coe Renzo Dalla Via - (Manager Consulting Services; IAPA)	2:30 PM	0:30	
5.15	Closing Remarks by IOL Sarnia Site Manager	Warren Burton Site Manager	3:00 PM	0:15	
5.16	Adjourn & Good-byes		3:15 PM	0:15	
5.17	Bus ride back to hotel or airport or train station or use taxis (group needs to decide strategy)		3:30 PM	0:30	
5.18	Arrive at hotel ???		4:00 PM		

Photograph of Participating Professors



Front – Professor Sohrab Rohani (University of Western Ontario), Dr. Louise Creagh (The University of British Columbia), Dr. Huu Doan (Ryerson University), Professor Doug McCutcheon (University of Alberta), Dr. Norman Peters (McGill)
Middle – Professor Anand Prakash (University of Western Ontario), Dr. John Shaw (University of Alberta), Dr. VT Bui (Royal Military College of Canada), Professor Toks Oshinowo (University of Toronto), Dr. Allan Gilbert (Lakehead University), Dr. William A. Anderson (University of Waterloo), Professor Levente L. Diosady (University of Toronto),
Back – Dr. Dusko Posarac (The University of British Columbia), Dr. André Y. Tremblay (University of Ottawa), Professeur Jerzy W. Jurewicz (Université de Sherbrooke), Dr. Faisal Khan (Memorial University of Newfoundland), Dr. Paul Amyotte (Dalhousie University), Dr. Michael J. Pegg (Dalhousie University), Barrie W. Jackson (Queen's University), Dr. Aaron Phoenix (University of Saskatchewan), Frank Collins (The University of New Brunswick), Dr. Carlos Filipe (McMaster University), Professeur M. Denis Rodrigue (Université Laval), Dr. Maen Husein (University of Calgary)

Organizing Committee

Summer Institute Planning Committee				
	Name	Affiliation	E-mail	Phone
1	Amyotte, Paul	Professor, Faculty of Engineering, Dalhousie University, Halifax, Nova Scotia	paul.amyotte@dal.ca	(902) 494-3976
2	Cairns, Rob	Process Safety, Bayer, Sarnia, Ontario	rob.cairns@bayerpolymers.com	(519) 337-8251 ext. 5143
3	Coe, Steve	Process Safety, Irving Oil Limited, Saint John, New Brunswick	steve.coe@irvingoil.com	(506) 202-6148
4	Creedy, Graham	CCPA, Ottawa, Ontario	GCreedy@CCPA.CA	(613) 237-6215
5	Dalla Via, Renzo	Manager - Consulting Services Team, IAPA, Toronto, Ontario	RDallaVia@iapa.on.ca	(416) 798-0220
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8	Marta, Manny	Process Safety, NOVA Chemicals, Sarnia, Ontario	martam@novachem.com	(519) 481-2747
9	McCahill, Patti	Business Analyst, NOVA Chemicals, Sarnia, Ontario	mccahipa@novachem.com	(519)862-2911 x2957
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