



**December 2008**

**Newsletter**  
**The System Safety Society**  
**Eastern Canada Chapter**  
**Ottawa, Ontario, Canada**  
<http://www.russona.com/ECC-SSS>  
[www.system-safety.org](http://www.system-safety.org)

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**System Safety Society Membership**

Consider completing the required form on the web [www.system-safet.org](http://www.system-safet.org) to become a member of the System Safety Society. Membership is not expensive and it offers benefits including the best system safety journal available, reductions at System Safety Society events, job ads, etc.

**Chapter Website**

Look for Chapter information on our website <http://www.russona.com/ECC-SSS>. There will be some changes made soon. We have purchased the domain name [www.systemsafetycanada.org](http://www.systemsafetycanada.org). In the new year we will move all the material currently on our website to this new location.

**President's Message**

Many positive changes have been occurring in the world of system safety in Canada. Safety related organizations are becoming more receptive to spending resources on system safety analyses, safety culture evaluations, and Safety Management System implementation. Owners and Boards responsible for safety critical operations are beginning to accept that money spent on system safety is money well invested. Parliament has passed into law the requirement for operators of safety critical organizations to implement a Safety Management System. As more people realize how proactive safety management identifies hazards which would eventually cost more to fix or possibly result in an accident, there is increased support for applying the system safety process.

**TRACES For Health Care: Training for Adverse and Critical Events in Safety in Health Care**

Sam Sheps and Karen Cardiff, based at the School of Population and Public Health at the University of British Columbia (UBC) have been funded by the Canadian Health Services Research Foundation (CHSRF) competition *Research, Exchange and Impact for System Support (REISS)*<sup>i</sup>, jointly with the Canadian Patient Safety Institute, to partner with three health authorities in Canada (Winnipeg Regional Health Authority, Saskatoon Health Authority, Vancouver Coastal Health) on an innovative program of system safety research that is based on the theories of resilience and resonance<sup>ii</sup>. This project provides an opportunity for patient safety leaders from three regional health authorities to work together with researchers from UBC to

develop and implement a staff training model for investigating and learning from “near misses” and adverse events in health care. The project also creates an opportunity for the regions to develop and test methods to evaluate the impact of the model on organizational learning with reference to patient safety. The three health authorities already share interests in creating a culture of patient safety. Thus regular engagement around a common interest and responsibility (i.e. patient safety) will strengthen existing collaboration and facilitate collective learning and lay the groundwork for building a community of practice with regard to understanding the genesis of adverse events in healthcare. This creates an opportunity for the decision makers and practitioners to continue to learn from and support each other through routine collective engagement beyond the completion of the project. Recognizing that the Winnipeg Regional Health Authority (WRHA) is actively engaged in a broad training strategy to acquire the requisite skills, knowledge and change in culture that is required to implement an innovative accident model that considers the dynamic and complex nature of safety in healthcare delivery, the key learning activities will be led by mentors within the WRHA. The approach will focus on building frontline staff and management skills in a number of key areas such as leadership and decision making to facilitate cultural change related to understanding, investigating and learning from “near misses” and adverse events. Moreover applying and, sharing ideas with, and learning from decision makers in different settings that share common challenges with regard to patient safety the three regions will gain additional benefit from comparing the application of new safety concepts in separate regions and provide useful information about the environmental/ structural constraints and incentives that influence the uptake and effectiveness of the model across geographic settings. Finally, this project is aligned with one of the key messages from our earlier work<sup>iii,iv</sup> in patient safety in which we emphasized the importance of developing the structural arrangements (e.g. Safety Management System) to support sustainable patient safety activities, such as investigation,

analysis, development of recommendations, with feedback to management and frontline staff, to promote organizational learning. For additional information about this project, contact Karen Cardiff <[karen.cardiff@ubc.ca](mailto:karen.cardiff@ubc.ca)>.

### References

- <sup>1</sup> See CHSRF website for details about the competition and the investigators on this project  
[http://www.chsrf.ca/funding\\_opportunities/reiss/index\\_e.php](http://www.chsrf.ca/funding_opportunities/reiss/index_e.php)  
<sup>1</sup> Hollnagel, E., Woods, D., & Leveson, N. (2006). *Resilience engineering: Concepts and precepts*. Aldershot, UK: Ashgate Publishing Co.  
<sup>1</sup> Sheps, S and Cardiff, K. *Governance for patient safety: Lessons from non-health risk-critical high-reliability industries*. A Report to Health Canada (Project #:6795-15-2003-5760006); December 2005.  
<sup>1</sup> Sheps S, Cardiff K. *Creating high reliability organizations in the Canadian health care system*. Report submitted to the Canadian Patient Safety Institute. June 2008.

### Safety Related Standards

During the past year, two international working groups met in Vancouver to work on safety-related standards, RTCA DO 178C and ISO CD 26262. Both meetings were organized by Critical Systems Labs, a Vancouver-based engineering consultancy that has activity participated in both of these working groups.

RTCA DO 178C is expected to replace RTCA DO 178B as the basis for the certification of airborne software. A variety of other industry sectors also look towards RTCA DO 178B for guidance in the development of highly dependable safety-related software. Approximately 130 members of the joint RTCA SC 205/Eurocae WG 71 working group met in January in Vancouver to continue their work on DO 178C. As the reader may know, the methods used to develop software for avionic systems are extremely conservative. For example, the objectives of DO 178B concerned with ensuring that avionics software is highly deterministic strongly discourage the use of dynamic memory allocation for Level A and B software. However, this restriction conflicts with the widespread use of object-oriented methods by the software industry as a whole. An important task for RTCA SC 205/Eurocae WG 71 working group is to determine how DO 178B can be updated to take advantage

of advances in software engineering knowledge without compromising the underlying principles of this standards such as ensuring highly deterministic behaviour. The System Safety Society helped to support this meeting through the loan of some equipment.

Switching from aircraft to automobiles, ISO TC 22 SC 3 Working Group 16 met in September in Vancouver. This working group is developing a new safety standard, expected to be known as ISO 26262, for the functional safety of electronic control system in road vehicles. With the introduction of various "drive-by-wire" technologies and active safety features, the family car is becoming a highly sophisticated network of software-intensive systems. The current draft of the standard includes a particularly interesting method of risk assessment that involves the evaluation of the risk associated with hazards in terms of severity, exposure (i.e., how likely is the vehicle to be in the traffic situation when an occurrence of this hazard would have harmful consequences) and controllability (what is the likelihood that the driver can intervene to prevent the harmful consequences of the hazard). Approximately 40 members of this international working group attended this meeting, including delegates from Germany, Canada, the UK, the US, Japan, Italy, France, Belgium and Sweden. This meeting was scheduled in conjunction with this year's annual conference of the Society. As hoped, a number of meeting delegates came early to Vancouver so they could participate in the conference. This included several excellent contributions by General Motors in the form of tutorial and paper presentations.

Jeffrey Joyce, P.Eng., Ph.D.  
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**Human Factors at WorkSafeBC**  
WorksafeBC is a statutory agency responsible for regulating Occupational Health & Safety in the province of B.C. To achieve this mandate and assist workers and employers in creating a culture of health and safety in the workplace, WorksafeBC

educates; consults; inspects and investigates accidents and diseases.

In 2003 WorksafeBC created the Fatal and Serious Injury Division to reduce serious injuries and mitigate fatalities. To fulfill this objective, WorksafeBC implemented a systematic approach to accident investigation adopted from the Canadian Transportation Safety Board and in 2004; Human Factors Specialists were integrated to support investigations of fatal and serious injuries.

The systems approach adopted by WorksafeBC recognizes in any incident, there are numerous interactions between the various workplace elements. By evaluating the interaction between people, workplaces, and management systems — the elements that make up the "workplace system" -we can probe into why a worker's decision or action made sense to that worker at the time. By understanding the context we can drive to change industry practices so their system of work is more compatible with human interaction.

Findings from investigations are communicated through the Lessons Learned team at WorksafeBC to industry and other key stakeholders with the goal to advance safety and prevent recurrence.

Applying the human factors approach in an industrial context is very interesting. No two investigations are the same. The opportunities that exist are unique and exciting. While it is very rewarding to see that industry is taking an interest in the human factor approach the most rewarding aspect is uncovering the system failures that might, on the surface, first appear to be operator error.

### **Beyond Investigations**

In addition to fatal and serious file assignments, the Human Factors team carries out independent investigations, conducts research, supports the WorksafeBC Lessons Learned initiatives, delivers education and training sessions and produces Human Factor bulletins, Hazard Alerts and reports to promote a systems perspective with the objective to

advance safety.

### **Reaching the World**

The Human Factor Specialists and WorksafeBC have also developed an external web page: <http://www2.worksafebc.com/Topics/AccidentInvestigations/humanfactors.asp> on WorkSafeBC.com, which includes case studies of accident investigations.

### **A Growing Community**

Due to the growing interest in human factors, this fall, WorksafeBC hosted the first Human Factors Community of Practice meeting. 45 guests including representatives from the Transportation Safety Board, BC Hydro, and BC Ferries, as well as several health care professionals and private consultants were in attendance.

We hope to provide an opportunity for human factors practitioners to come together and share their knowledge and expertise so that together, we can help each other solve problems and expand the profession, so everyone is speaking the same language and on the same page as we move forward.

### **Working to Advance Safety**

While Human Factors work is a new perspective at WorksafeBC, through research and understanding, Human Factors is helping to transform workplace and societal attitudes by changing the mindset on human error. We are striving to keep the health and safety promise for workers in B.C. by advancing safety in the workplace and ensuring a safe work environment -what WorksafeBC is all about.

### **International System Safety Conference – August 2008**

The International System Safety Conference 2008 in Vancouver was a great success. The Sheraton Wall Centre provided excellent service and a beautiful setting in downtown Vancouver. We had over 400 people in attendance from 19 countries. There were 65 people from Canada representing a wide range of system safety speciality areas including aviation, medical, nuclear, rail, and others. Government, military, academia and industry were all well represented with participants from Transport

Canada, NAV CANADA, Thales Rail Signalling Solutions Inc., Canadian Transportation Safety Board, Critical Systems Labs, Maury Hill and Associates, Inc., DND, BC Hydro, Carleton University, Canadian Nuclear Safety Commission, Dalhousie University, Defence R&D Canada, DRDC Valcartier, Fraser Health, Surrey Memorial Hospital, General Dynamics Canada Ltd, Honeywell International, Kinetics Drive Solutions, Inc, McDonnell Consulting Inc., McKesson Medical Imaging Group, OHSAH, Ronback and Associates, Robert Fletcher System Safety, Inc., University of British Columbia, University of Montreal, University of Waterloo, Work Safe BC, and others. In keeping with the theme; “The Next Generation of Safety Professionals”, more students were present than at previous conferences. Many new features were introduced, including peer review papers for academic credits, posters, “just in time” sessions, and many more. In addition to the many high quality technical papers and social activities, Vancouver and the surrounding area provided a great opportunity for people to spend vacation time. After the conference some families took a Holland America cruise to Alaska.

Several people from Canada presented quality papers and workshops. Heather Henderson from NAV CANADA presented a paper on “*Integrating an SMS*”.

There was a strong international attendance. Countries represented included; Australia, Austria, Belgium, Brazil, Canada, China, France, India, Germany, Israel, Italy, Japan, Netherlands, Russia, Singapore, Sweden, Turkey, UK, and the USA.

### **November 08 System Safety Presentation**

On 27 November the Eastern Canada Chapter hosted the first noon event of the current Society Year. Ms. Kathy Fox made a presentation at the RCAF Mess Control Room entitled; “*Evolving approaches to managing safety and investigating accidents - From individual to organizational safety management*”. The abstract for this presentation read; “In the past 20 years, the Canadian aviation industry has come a long way in how it thinks about and manages

safety risks. It has evolved beyond just focusing on operator performance (i.e. human error) and ergonomic/technical factors. The industry now strives to understand the influence of organizational factors and processes that create a context for error in complex, safety-critical systems.

This presentation identified how and why the industry has changed its approach by emphasizing the development and implementation of safety management systems. In particular, it focussed on the importance of formal, documented risk assessment processes, safety reporting systems, the potential downside of safety performance indicators and examined a different approach to investigating incidents and accidents.

As Vice-President, Operations for NAV CANADA, Ms. Fox was responsible for providing executive leadership and direction throughout the Operations Group of Canada's Air Navigation Service provider. She retired from NAV CANADA in June 2007 and has been a Member of the Transportation Safety Board of Canada since July 2007.

In addition to her work in air traffic control, Kathy Fox has been extensively involved in other aviation activities for over 35 years, including sport parachuting and commercial aviation. She holds an airline transport pilot licence, has flown over 4,000 hours and still flies part-time as an instructor and pilot examiner. She received the Transport Canada Aviation Safety Award in 1999. In November 2004, she was inducted into the Quebec Air and Space Hall of Fame.

### **Upcoming Activities**

The System Safety Society in Canada is organizing three more noon events in 2009 and a half-day Spring Event. The theme of

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the Spring Event will be "How **Safety is Managed** in '\_\_\_\_\_'. We will choose expert speakers from four or five industries; such as: aviation, nuclear, petroleum, medical, and others

We look forward to seeing you!

### **Call for More Articles**

We hope these articles have helped to stimulate your interest in this newsletter and that other readers, too, will help make future editions equally interesting by sharing their ideas and experiences from working on safety critical or safety related projects.

We need articles of approximately 200 words. In which we want you to share your thoughts and experiences.

What "system" have you analysed? How did you conduct the analysis? What were the hazards you identified and the mitigation that was enacted to reduce the level of risk associated with each hazard? What safety techniques did you use? How did you measure the level of risk after the mitigation was completed?

We are also interested in receiving articles on Safety Management Systems (SMS). What is the framework or structure that was established for your SMS? What are the key policies and procedures within your SMS?

Please send your articles to Robin Rousham at [robin.solange@sympatico.ca](mailto:robin.solange@sympatico.ca). Robin will review the articles and prepare the newsletter for distribution.

Your help is most sincerely appreciated.