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of Canada

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Canada

TSB Transportation Safety Summit 2016

Proceedings



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Executive Summary

Encouraging the flow of safety information

Safe operations, in any mode of transportation, are achieved when risks are continually identified, evaluated, and mitigated. The unrestricted information flow throughout the organization is critical to this effort. Information flow, in turn, depends on a supportive safety culture and effective safety management processes.

This report provides a detailed account of the two-day Transportation Safety Board (TSB) Transportation Safety Summit, held in Ottawa on April 21-22, 2016. More than 70 senior executives and leaders representing operators, labour organizations, industry associations, and regulators attended the summit. Through a combination of presentations, expert panels, and facilitated working groups, the summit provided a forum to hear experiences and best practices and to exchange and challenge ideas about how to encourage information flow to improve safety.

In this report you will find

- a vision of how effective safety culture and safety management can help to improve safety proactively;
- examples of how successful companies have developed their safety culture and safety management practices to improve information flow;
- a discussion of potential obstacles to realizing the vision, and ideas to overcome these obstacles, including the importance of trust in changing organizational culture; and
- a discussion of the future use of voice recorders and video recorders to improve safety.

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Introduction and background

This report provides a detailed account of the two-day TSB Transportation Safety Summit, held in Ottawa on April 21-22, 2016. This introductory section explains the summit, including the rationale for the themes explored at the summit and an outline of the summit's structure.

Following this is a brief summary of the key messages from all of the presentations, expert panels, and breakout sessions. Links to the materials used by the various presenters are provided.

All of the output from the 4 breakout sessions, during which participants provided their thoughts on the themes of the summit, are included as appendices to this report.

Theme of the Safety Summit: Information Flow

Information flow was chosen as the theme of the TSB Transportation Safety Summit because, in the words of TSB chair Kathy Fox in her opening remarks,

Over the past few years, TSB investigations have identified multiple examples where risks in the transportation system went unaddressed. In some cases this was because an issue was not identified—either the data was not available, or it was not being mined. In other cases, issues were identified, but weak or missing processes for managing safety contributed to an inability to take action.

Effective information flow, which allows risks to be identified proactively and mitigated, relies on safety management processes that collect data and turn them into outputs having all the characteristics of good information. Good information provides answers to questions the receiver needs answered, is timely, and is presented in a way that the receiver can use.¹

Equally critical is a safety culture that actively encourages people to provide data through safety management structures and to make maximum use of the information emerging from them. Information flow is maximized in generative safety cultures characterized by a high level of trust, focus on a common mission, and a level playing field with a low level of hierarchy.²

Given the importance to effective information flow of both safety culture and safety management, the summit explored both topics over the 2 days.

Structure of the Safety Summit

More than 70 senior executives and leaders representing operators, labour organizations, industry associations, and regulators attended the summit. It aimed to provide a forum to exchange and challenge ideas about how to encourage information flow to improve safety. To that end, the summit included a number of different session formats:

¹ R. Westrum, "The study of information flow: a personal journey," *Safety Science*, Vol. 67 (2014), pp. 58–63 at p. 60.

² *Ibid.*, p. 61.

- ***Presentations and keynote presentations:*** to present ideas, broaden thinking, and present a new direction for effective safety management;
- ***Expert panels:*** to present concrete examples of these ideas in action and demonstrate how other organizations have moved in this direction; and
- ***Breakout discussions:*** to provide a forum for participants to brainstorm, share ideas, ask questions, and think about how their organizations can move further in this direction.

An outline of the sessions held during the summit is provided in the table below.

For the breakout sessions, participants were divided into 8 groups. For the first 3 sessions, groups were multi-modal, while the fourth session consisted of mode-specific groups. Facilitators from the TSB managed the breakout sessions; input was captured on flip charts and simultaneously by a note taker. Facilitators were instructed to capture ideas, to the greatest extent possible, in the words of the participant. The information presented in the appendices to this report includes the notes compiled during the breakout sessions, with minimal editing.

Table 1: Structure of the safety summit

Format	Presenter	Title
Keynote address	Ron Westrum Eastern Michigan University	Getting Information Flow
Presentation	Faye Ackermans Board member Transportation Safety Board	Statement of Safety Issue Support: Review of Findings and Systemic Risks
Expert panel	Moving Organizations Toward a Cooperative, Trust-based Relationship	
	Marc Beaulieu Chief Transportation and Safety Officer VIA Rail	Just Culture
	Larry Lachance VP, Safety and Quality NAV CANADA	Just Culture
	Jamie Marshall VP, Fleet Operations BC Ferries	SailSafe
Breakout discussion	Breakout 1: How can we move organizations toward a just culture?	
Keynote address	Jack Davis Chairman and CEO Mobile Inc.	Case Study from Health Care
Breakout discussion	Breakout 2: Maintaining confidence in your system while maintaining information flow: What would you do?	
Expert panel	Panel 2: Using leading indicators or data sources/processes for a proactive and predictive approach	
	Norrie Ramsay Sr. VP, Technical, Projects and Systems, Centre of Excellence, TransCanada PipeLines Ltd.	Leading Indicators
	Paul Spring President Phoenix Heli-Flight	A Business Case for Data Recording Technology
	Scott Wilson VP Flight Operations WestJet	Safety Management
Breakout discussion	Breakout 3: How do you find trouble before trouble finds you?	
Presentation	Kirby Jang Director, Rail and Pipeline Investigations Transportation Safety Board	Expanding the Use of On-board Voice and Video Recorders
Presentation	Jean Laporte Chief Operating Officer Transportation Safety Board	Usage of Voice and Video Recorders: Balancing Rights and Obligations
Breakout discussion	Breakout 4: How do we maximize the use of voice/video while balancing rights and obligations?	

Day 1: Information Flow and Safety Culture

Keynote address: Getting Information Flow

Professor Ron Westrum from Eastern Michigan University delivered a keynote address on the topic of [improving information flow in organizations](#). He described information flow as the process of getting information from the people in the organization who have it to the people who need it, and making effective use of that information.

Professor Westrum used a number of examples to illustrate 3 common problems related to information flow in organizations:

- People are aware of a problem but don't speak up;
- People are not aware of a problem because information is not analyzed or indications of a problem are too faint to be detected; and
- Disjunction exists between management and the operating level.

These issues can be overcome by developing a state of “requisite imagination” where people are encouraged to “imagine how and why things might go wrong, and then probe deeply along potential fault lines.”

Relating requisite imagination and information flow to organizational culture, Professor Westrum emphasized that information flow will be maximized in a generative culture where people believe they belong to a common enterprise. To report faint signals, employees must feel that they are aligned with the organization's management, have (or can get) the key expert knowledge to determine if something is wrong, and feel empowered to speak up.

Such a culture can be developed by focusing on the organization's mission and creating a level playing field with minimal hierarchy.

Professor Westrum concluded by stating that developing a workplace focused on cooperation requires a high level of trust and respect throughout the organization.

Presentation: TSB Findings Related to Information Flow

TSB Board member Faye Ackermans presented a [summary of TSB findings](#) included in recent reports that illustrate the issues the Board has been seeing in the areas of information flow, safety culture, and safety management.

As shown in the table below, 134 reports from all 4 modes were reviewed; 22 of these contain findings related to information flow (IF). The reports included 21 findings as to cause and 29 findings as to risk.

**Table 2. Reports reviewed**

Mode	Period	Reports reviewed (had IF findings)	Causal findings	Risk findings
Pipeline	2013–2014	3 (2)	3	4
Rail	2011–2014	58 (6)	6	5
Marine	2012–2014	35 (7)	4	9
Air	2013–2014	38 (7)	8	11

These findings were linked to 2 broad types of problems related to information flow: either information was not flowing through the organization, or information was flowing but risks were not being mitigated. Seven key themes were identified across these 2 areas, as outlined below.

Information not flowing

In cases where information was not flowing, the reasons fell under 4 main themes:

- risks were accepted as part of the job, or risk adaptation had occurred;
- unsafe practices were condoned in a poor safety culture;
- weak incident reporting or investigation processes did not identify risks, and therefore opportunities to mitigate were missed; or
- safety management practices did not exist, or existed only on paper and were not being used, allowing issues to go unaddressed.

Information flowing but risks not being mitigated

In cases where risks were not mitigated despite information flowing, the reasons fell under 3 main themes:

- weak safety processes did not facilitate risk mitigation;
- information did not reach the right people;
- design parameters were not recognized as potentially problematic.

Specific examples of investigations that illustrate how these issues contributed to unsafe conditions not being addressed were presented on [posters](#) displayed throughout the summit.

Expert panel: Moving organizations toward a cooperative, trust-based relationship

This expert panel provided an opportunity for participants to hear, first hand, how 3 organizations have worked to move toward a cooperative, trust-based relationship in managing safety. Speakers represented VIA Rail, NAV CANADA, and BC Ferries.

- [Marc Beaulieu, Chief Transportation and Safety Officer for VIA Rail](#), described the organization's efforts to implement a just culture framework. He emphasized the critical role that collaboration with the unions played in implementing such a framework in the context of the company's labour relations history. He also outlined a number of safety improvements

in the areas of training, procedures, and safety management that have resulted from this collaboration.

- [Larry Lachance, VP Safety and Quality at NAV CANADA](#), described the company's experience in implementing a just culture framework. He emphasized a strong belief from senior management that people were motivated to work safely and an approach to implementation that involves, rather than imposes, as being fundamental to success. He described some of the issues that came up during implementation that had the potential to derail this strategy, and presented safety data that clearly demonstrated the value of this approach.
- [Captain Jamie Marshall, VP Fleet Operations for BC Ferries](#), described the company's implementation of its SailSafe program, the goal of which was to transform the company's safety culture and the company's safety management system to be a world leader in safety management. He emphasized that this undertaking required a collaborative effort between management and unions, and described the value that external expertise brought to the process. The results of this collaboration included 85 action plans to improve safety in 4 key areas: people, assets, procedures, and communication. Since these initiatives, the company has experienced a significant reduction in accidents and a significant increase in proactive reports of hazards and near misses.

Breakout discussion 1: How can we move organizations toward a just culture?

The purpose of this session was to identify the means to develop a just culture by capitalizing on opportunities and overcoming obstacles. Participants were asked to brainstorm on both of these areas before devoting their attention to identifying how the most important best practices could be implemented and challenges overcome.

The full output from this breakout discussion is presented at Appendix A. The key themes are summarized below.

Key themes and messages from Session 1: Trust and respect

The discussions during this session strongly echoed the themes of commitment, collaboration, trust, and respect described in the keynote address and by all of the expert panellists.

In terms of best practices, communication and collaboration stand out as critical themes for moving toward a just culture. Specifically, participants highlighted senior management commitment, which is demonstrated through actions, measurable results, and resources dedicated to organizational learning. The importance of actively involving people at all levels of the organizations in safety processes was also stressed.

On the other hand, the discussion about obstacles to moving toward a just culture revealed the challenge of overcoming existing cultures involving blame and fear by actively building trust through collaboration. The importance of a frank and honest appraisal of the current culture, combined with ongoing commitment, collaboration, and communication to overcome mistrust and fear, were emphasized.

Keynote address: Case Study from Health Care—Part 1

Jack Davis, chairman and CEO of Mobile Inc. and former president and CEO of Calgary Health Region, provided a [detailed analysis](#) of a case involving a medication error that led to the death of 2 patients. The presentation was delivered in 2 parts. In the first part, Mr. Davis described the events that took place in the case study; participants then participated in the second breakout session.

Breakout discussion 2: Maintaining confidence in your system while maintaining information flow

The purpose of this session was to encourage an open and frank discussion about the limitations of discipline to change behaviour and how to maintain fairness and transparency in safety processes. Participants were asked how they would respond to these events in order to balance 2 competing priorities—being seen to be responding to events while encouraging information flow to prevent recurrence.

The full output from this breakout discussion is presented at Appendix B. The key themes are summarized below.

Observations on key themes and messages from Session 2

Two observations clearly stand out in reviewing the output from this breakout session:

- First, there was a high level of consensus among participants with respect to the course of action required to balance the competing priorities. Very few areas caused disagreement within the groups.
- Second, the vast majority of actions identified targeted the system rather than the individual. Actions related to the individuals involved were largely focused on protecting both these individuals and the system from further harm, while focusing efforts on understanding the errors that took place.

Taken together, these observations clearly demonstrate that all of the groups embraced the values and beliefs needed to establish a just culture. Specifically, they indicate that all of the groups believed that errors are a symptom of issues within a system—at least when dealing with a case study of an external organization that is made up of trained professionals in whom we regularly place a high degree of trust. Further, they clearly communicate the belief that efforts to address these systemic issues will allow these same trusted professionals to work effectively and safely.

These observations are particularly interesting in the context of observations from Session 1, where communication and collaboration were identified as the key building blocks of trust. Taken together, it is clear that, at a philosophical level, the values and beliefs that underpin a just culture are widely held. At a practical level, however, the biggest challenge identified in terms of bringing about a just culture was the need to build trust and respect in organizations that may have a history of blame.

The second part of the keynote address described the approach taken to do just that in the Calgary Health Region following the event.

Keynote address: Case Study from Health Care—Part 2

In part 2 of the keynote address, Mr. Davis outlined the steps taken to identify and address the issues that led to the medication error while reassuring stakeholders that sufficient action was being taken.

In the end, the actions Mr. Davis described are consistent with the actions identified by all 8 of the breakout groups at the safety summit. Individuals involved in the events were off work with pay while investigations were ongoing. They were also provided with counselling and support, and returned to work with no disciplinary action being taken. At the same time, there was a significant level of collaboration and cooperation with staff to identify means to prevent recurrence and open communication with all stakeholders to share lessons learned.

However, Mr. Davis also described significant challenges in taking these actions. Echoing key themes from earlier in the day, he identified that overcoming an established culture of blame required significant effort. He said, “Our culture was the problem,” describing the existing culture as hierarchical, focused on individual responsibility, lacking a sense of system, being organized for failure, and eliciting a shame and blame response when faced with human error. He emphasized that the system had to change, because an inappropriately punitive system drains energy and contributes to low morale; people with low energy and low morale cannot care and therefore cannot effectively contribute and collaborate to improve the system.

Overcoming this culture of blame required a lot of effort. Some helpful initiatives included

- establishing a Board committee for safety;
- creating a safety department led by a vice-president;
- assigning additional resources to safety;
- establishing a code of conduct with policies on disclosure, reporting, informing, and a just and trusting culture;
- conducting frequent safety briefings; and
- establishing a patient family advisory council.

Mr. Davis concluded by summarizing the impact these efforts to change the culture had on the system. People were more confident and more engaged, which created more willingness to participate actively in improving the health care system. Echoing the results of the first breakout session, therefore, a frank and open assessment of the existing culture facilitated a concerted effort to build trust and respect, resulting in a more effective safety culture where information was flowing.

Day 2: Information Flow and Safety Management

Expert panel: Using leading indicators for a proactive and predictive approach to safety

This expert panel offered participants concrete examples of the types of proactive, predictive processes and data that organizations were using to identify safety issues.

- [Norrie Ramsay, VP, Technical Centre of Excellence for TransCanada PipeLines](#), gave an overview of how TransCanada PipeLines manages pipeline integrity and safety with a full life-cycle management, including a system-wide risk assessment, threat management, in-line inspection, and damage prevention.
- [Paul Spring, president of Phoenix Heli-Flight](#), delivered a presentation on how Heli-Flight was able to learn from its own experience and implement data recording technologies to ensure that policies and procedures are followed and to increase safety. He made a strong business case for the value of data recording technology.
- [Scott Wilson, VP Flight Operations at WestJet](#), gave a clear demonstration of the value that proactive safety processes offer in identifying safety issues. He also stressed that a strong safety culture and in-depth data analysis are key to enhancing safety, pointing out that “your next occurrence is probably already in your data.”

Breakout discussion 3: How do you find trouble before trouble finds you?

During this breakout discussion, participants were asked to brainstorm on the following issue: “To help people get better at identifying and mitigating hazards without having incidents or accidents, we need to....” They were then asked to identify the main themes in the ideas identified.

The full output from this breakout discussion is presented at Appendix C.

Observations on key themes and messages from Session 3

To provide a summary of the ideas presented in this breakout session in the context of the safety summit, a number of the ideas presented in Appendix C have been organized in the table below. They are categorized according to the issues associated with information flow identified in the TSB review of occurrences. This is not an exhaustive list, but presents some of the ideas or possible solutions identified.



Table 3. Summary of the ideas presented in this breakout session

Problem	Because	Ideas to overcome
Information not flowing	Risks are accepted as part of the job	<ul style="list-style-type: none"> • Reward the use of stop work protocols; • Periodic reviews of environment to identify new safety risks; • Communicate top safety risks; • Encourage chronic unease—requisite imagination; • Job safety analysis for specific tasks; • Job safety briefings before tasks.
	Unsafe practices are condoned in a poor safety culture	<ul style="list-style-type: none"> • Need generative culture to enable collection and use of data; • Take action to address unsafe practices; • Communication, collaboration, and celebrating successes.
	Weak incident reporting or investigation processes did not identify risks, and opportunities to mitigate were missed	<ul style="list-style-type: none"> • Good risk assessment processes; • Independent audits of safety processes; • Benchmarking of safety processes against competitors.
	Safety management practices did not exist, or existed only on paper	<ul style="list-style-type: none"> • Clear triggers for risk assessment; • Training people in safety management processes, including risk assessment. These are perishable skills that need to be reinforced; • Feedback provided to people reporting safety issues to encourage further reporting.
Information flowing but not leading to risk mitigation	Weak safety processes did not facilitate risk mitigation	<ul style="list-style-type: none"> • Risk assessment process with clear triggers; • System to follow through risk assessment mitigations to completion; • Data mining—effective data analysis.
	Information did not reach the right people	<ul style="list-style-type: none"> • Communication, collaboration, regular safety meetings; • Address obstacles to using data.
	Design parameters were not recognized as potentially problematic	<ul style="list-style-type: none"> • Effective risk assessment processes with clear triggers.



Presentation: Expanding the Use of On-board Voice and Video Recorders

Kirby Jang, Director, Rail and Pipeline Investigations for the TSB, delivered a presentation on [the use of voice and video data in locomotive cabs](#). He reviewed a number of investigations that were hampered by the lack of on-board voice and video recordings, and outlined the Board's previous recommendations and Watchlist calling for the mandatory installation of this technology. He then gave an update on the status of the joint TSB–Transport Canada study on the use of locomotive voice and video recorders.

Presentation: Use of Voice and Video Recorders—Balancing Rights and Obligations

Jean Laporte, chief operating officer of the TSB, presented on the [current regulatory framework for the use of voice and video recorders](#) and the protections afforded these recordings by the *Canadian Transportation Accident Investigation and Safety Board Act* (the Act). Acknowledging that the world has changed since the Act came into force, he outlined the rights and obligations of a range of stakeholders that must be considered in any future discussion of how such data could be used to advance safety.

He went on to outline a number of questions that must be considered, including

- What is the definition of an on-board recorder?
- What/who can be recorded?
- Who can have access to the recordings?
- What use can be made of the recordings?
- How long are the recordings retained?
- How can the rules be enforced and who will enforce them?
- How do we respond to criminal investigations/prosecution and civil litigation issues?
- How do we reconcile with different laws, regulations, and rules in other countries?

Advocating a thoughtful approach to changes to the regulatory framework, Mr. Laporte concluded his presentation by saying, “We all have some thinking to do in order to prepare and be ready, because there are no easy answers to all these questions. Once we open the door, it will be very difficult to close it. We therefore need to do things right the first time.”

Breakout discussion 4: How do we maximize the use of voice/video while balancing rights and obligations?

The full output from this breakout discussion is presented at Appendix D. The key themes are summarized below.

Observations on key themes and messages from Session 4

The uses that participants identified for voice and video data varied widely, and included incident investigation, training, and normal operations monitoring. Recognition of the value of voice and video data to improve safety was not universal; some participants questioned whether it would have



a value to improve safety or whether organizations would be willing to invest in the technology if the use of the data was limited.

Obstacles to the use of voice and video data echoed key themes heard in other breakout sessions, including trust and the need for a common understanding of the limitations and benefits of the data.



Appendices

Appendix A: Output from Session 1

How can we move our organizations toward a just culture? Barriers and opportunities

The purpose of this session was to identify the means to develop a just culture by capitalizing on opportunities and overcoming obstacles. The session followed the keynote address by Professor Westrum and the panel discussion on safety culture, during which 3 speakers shared their experiences working to transition their organizations toward a just culture.³

Objective

Identify means to capitalize on opportunities and overcome barriers in moving toward a just culture.

Process

- Brainstorm best practices.
- Brainstorm obstacles.
- Identify how to capitalize on most promising best practices.
- Identify means to overcome most significant obstacles
- Repeat 3 and 4.
- Identify points to report back to plenary.

Step 1: Brainstorm best practices

Participants were asked to identify best practices in moving an organization toward a just culture. The ideas generated for all 8 breakout groups are as follows:

- Policy on safety and non-punitive and self-reporting
- NAV CANADA process to determine when discipline-free is warranted
- Constant top messaging from top down
- Walk the talk—important from top managers
- Involving employee rep as equal partners
- Give employee opportunities and mechanisms to participate
- Quota to report near misses
- Senior management feet on the ground
- Unfiltered information
- Do not accept behaviour contrary to safety culture

³ The information provided in the appendices includes the notes for all 8 breakout groups. Minimal editing has been performed to maintain the integrity of the ideas as presented by participants. For the same reason, duplicate ideas from multiple groups have not been combined.



- Top-down leadership
- Management has to believe in it to support it
- Trust among those reporting into it
- Believing in the system
- Everyone has a voice that needs to be heard, from Board members to junior employees
- Direct link from management to employees
- No fear of reprisal
- Commitment to written policy by accountable executives
- Written in understandable language: no legalese
- Visible to employees
- Clear and unambiguous
- Written by front-line staff, plus buy-in, plus understanding
- Oversight (third party to look at to keep both sides honest)
- Making decisions at the right level, including safety/work practices (helps understand circumstances)
- Information flow (the simpler the better)
- Inclusive leadership
- Transparency
- Senior management believes rather than only supports
- Team spirit
- ALERT—all learning events reported today
- Safety promise
- Safety processes (e.g., hazard reporting, non-punitive)
- Trusted communication channels
- Building and investing in relationships—trust
- Ref: Jody Hoffer Gittel: “the Southwest airlines way” (e.g., walking the talk)
- Feedback to reporter; the crews
- Leading by example
- Fairness and consistency of application of policies
- Respect
- Accountability (all levels)
- Need a committed leadership team
- Committed and passionate (passionate to be successful)



- Breakdown communication barriers
- Common goal
- Vision that needs to be communicated
- Leadership needs to communicate just culture—vision
- Need to ensure buy-in at all levels
- Build a culture of trust
- Clearly articulated limits on the reporting policy
- Common understanding of what just culture is, as there are misconceptions—is it non-punitive, is it a balance between non-punitive and blame culture? Need to communicate and educate all as to what it means.
- Educating everyone
- Implementation of workshop panels
- Deep understanding by leadership of how operations work—then getting out and interacting to understand how front line works
- Ensure that you have legal on side
- Accountability at all levels, including peer to peer
- Celebrating successes
- Use of technology to support human aspects
- Structured workshops to bring management and employees together on work panels to deal with issues
- Same page, how just culture is defined
- Need to think how lines of communication work in an organization and verify these lines; understand lines of communication in your organization
- Establish just culture as a value for organization and/or clearly establish objective
- Define and educate both sides for what it is: educate all parts of the organization what is a just culture
- Clear narrative: what just culture is or provides; strong examples of what just culture is
- Once you have moved to just culture, you need to be able to listen to get past the no
- Living process of just culture; must be part of the process; is it working; must have buy-in from the top; integration and follow through within the organization
- Provides a safe space so you can build trust to go forward
- Critical incident provokes inquiry; focus on critical incidents
- Develop a process to follow up
- No need to reinvent the wheel; it may exist already: e.g., aviation industry; you may need only to modify; learn from another organization



- Multi-stakeholder planning meetings
- Moving to performance-based similar problems
- Go deeper than risk itself, specifically action taken to reduce risk
- Safety awareness
- Self-policing: draw upon others; do most important thing
- Go deep in culture to reinforce
- Involve union in mandate (same)
- Environment where near misses noted, reported, and reacted to avoid accident reaction and focus on avoidance
- Gross negligence: follow procedure—well understood—tolerance set
- Leaders—authentic—felt leadership and safety is number 1
- Continually show leadership
- Common sense vs. common practices
- Inundated in safety-first culture reminders
- Lead from the top
- Employee commitment
- Clear communication to all staff and between all staff; articulated non-punitive reporting processes
- Discussion around amnesty; between management and employees; clear understanding and agreement
- Employee training about just culture. You can never assume they will understand what you mean.
- Patience, and let it grow naturally; let's not push it and impose it. Let them see positive effects on their own.
- Organize events to share bad practices, tying the family aspect into it
- Building a video presentation for learning based on support from policy
- Key from getting support from management. Demonstrating compassion. Employee to employee, not only management to employee. Looking out for each other.
- Leveraging health and safety using OHS committee
- Walk the talk
- See it to believe it
- Change culture
- Employee engagement
- Using safety data to support mutual decision
- Drilling down to cognitive

- Human factors issues—understood
- Communicating investigation reports to employees
- Need to define just culture—median between no discipline and discipline for your organization (people have different definitions)
- Need consensus and buy-in from senior management and stakeholders
- Engagement process has to be from all
- Need a consensus of what the definition is—then figure out where are we?
- And do we have a safe culture?
- Do figure out where you're at—you have to test it without having a preconceived expectation
- Need science behind assessment process—has to reflect the reality of your organization
- You could do a survey to take stock
- To conduct an assessment process, you want to ensure the information is accurate (remove bias)
- You could do a group session
- Need to manage expectations

Step 2: Brainstorm obstacles

Next, participants were asked to identify obstacles to moving an organization toward a just culture. The ideas generated for all 8 breakout groups are as follows:

- Relationship management
- Resistance to change
- Culture of blame
- Control of information
- Loss of control of front-line managers
- Fear of loss of control
- Safety not a key performance indicator
- Hierarchy an impediment
- Impatience
- Determining fiscal impact
- Perceived as flavour of the month—changing ideas
- Discipline
- Passing accountability to the top
- Lack of trust



- Paradigms (resistant to change because it was the way they always did it)
- Identified goal: is it attainable?
- Potential cost involved
- Proper communications; fear of degrading management authority
- Finding balance between safety performance and management performance
- Current culture (corporate culture and union culture; industry, mode, geography)
- Production
- Reporting from the front line (“union told me not to report on my colleagues”)
- Social norms (e.g., based on national culture: i.e., questioning authority)
- Resistance to change
- Implementation of change and communication
- Labour model and turnover
- The legal process/systems (criminalization, litigation)
- The regulations (much work associated with implementing new regulations takes time from safety work)
- Overcoming historical work practices
- “What is the line?”—Defining behaviour
- Scalability—to size and scope of company
- Legal opposition (fear of litigation)
- Unrealistic expectations
- Mindset—fear of change
- Perception that it may create suspicion of motive from employee
- Denial that it is needed
- Creates more work
- Lack of understanding from employees
- Lack of resources to be able to implement all best practices
- Inertia
- Costs
- Lack of trust
- Marine industry is very litigious, so going down this road, lawyers feel this is a major liability, so they try to put blockages in the way
- Punitive regulatory scheme makes people think twice about regulatory scheme/fear of litigation



- Different goals defined by the organization; different people may have different vision and not have a common goal
- No cross communication—silos
- Lack of trust
- Fear culture—worry that senior management may react
- No follow-up
- Black swan—major events rare—keeps people thinking
- Primacy—past culture—work harder to grow organization culture
- Changing culture is difficult after years of operating
- Seeing that safety is more efficient
- Resistant to change
- Bureaucracy
- Competing priorities—what stops to focus on safety?
- Trust
- Marketing is not being fed down to the working level (no fear of losing control; it is the opposite)
- People not wanting to change
- People not wanting to believe it if they don't see it, difficult to bring something new on board
- Fear of bullying
- Workload vs. commitment
- Takes time to implement
- Letting go, accepting the change
- Rules need to be better defined; “critical rules” need to be defined
- Last of trust
- Lack of understanding
- If scope is too big (gap analysis shows you're far from where you are to where you want to be—you need to tackle smaller chunks)
- Need to figure out scope—develop plan
- Need to fight cultural inertia—all organizations have it, so you'll have to address it (bad relationship between employees and management)
- Inconsistent leadership
- Lack of rigidity is an obstacle
- You need some rigidity or you lose trust—and you're going to “drift” into old ways of doing business



- Insufficient communications
- People aren't aware of important information
- Resistance to change
- ROI—return on investment
- Need financial and executive support
- Lack of resources
- How do you reconcile finance and safety?
- Lack of requisite imagination
- Need to know what the business benefit is—or you won't make the changes
- It's hard to imagine how much an accident is going to cost until you have to spend it
- Lack of alignment in the organization—from senior management all the way down

Step 3: Identify how to capitalize on most promising best practices

Third, groups were asked to identify 1 or more of the most promising best practices from step 1 and identify how these could be implemented. The best practices selected and ideas for all 8 breakout groups are as follows:



Table 4. Best practices and ideas for implementation

Best practice	How to implement
CEO signed policy on non-disciplinary self-reporting	<ul style="list-style-type: none"> • Self-explanatory • Selling it • Feet on the ground • Speak as senior leader • Walk the talk • Live by it • Ensure employees read it • Policy becomes the culture
Senior management feet on the ground	<ul style="list-style-type: none"> • Plan it • Prepare it • KPI it (make it a key performance indicator) • Formal reporting process: 2-way reporting
NAV CANADA process	<ul style="list-style-type: none"> • Determine what is disciplinary and what is not • Collaborative process • Communicate process
Management has to believe in it to support it	<ul style="list-style-type: none"> • Education • Accountability • Good leadership (do not impose it, show the way) • Walking the talk (do not just post the policy, put it on the agenda, talk) • Leadership must be visible (best information from lunchroom; be on their turf) • Statistics and results • Having the right metrics • Set priorities to avoid initiative overload
Leadership at each level	<ul style="list-style-type: none"> • Run the safety management process • Must have the resources • Communication, dialogue on events
Safety promise and defining what the organization means	<ul style="list-style-type: none"> • Must have resources • Buy-in, involve the employees • Visible and communicated results from the safety policy being actioned—continual
Commitment/communication from the top—living the culture from the highest level of the organization	<ul style="list-style-type: none"> • Early communication with employees • Show commitment through actions • Eliminate behaviours counter to just culture • Focus on benefits of just culture
Provide strong examples	<ul style="list-style-type: none"> • Lead by example
Critical incidents	<ul style="list-style-type: none"> • You learn from your mistakes • Resources to identify the root causes and understanding why it happened, but also how to prevent it • Talk is cheap; must demonstrate and commit with resources;



Best practice	How to implement
	take action
Self-policing	<ul style="list-style-type: none"> • Safe—feeling supported: individual failures vs. organization • Reporting—culture—front line; responsible to manage front-line challenges—report all • Everyone reporting
Leadership (near miss reported)	<ul style="list-style-type: none"> • Everyone passionate—walking the talk
Not specifically identified	<ul style="list-style-type: none"> • Making sure the employee groups and management group are engaged in discussions • Awards program: recognition and positive reinforcement • Defining critical rules, processes, and communicating them • Drilling down extensively on what happened on each incident. Tracking employee records. Safety is clearly communicated; extensive training—holding people accountable because they have been trained • Management backing decision of employees for taking safe decisions • Instills sense of professionalism
Not specifically identified	<ul style="list-style-type: none"> • Consensus and buy-in • All stakeholder-agreed definition of just culture • Definition has to be agreed upon • Table talk: disagreement about saying “just culture” versus “fair culture” • Understand where you’re at from top to bottom
Vision is important	<ul style="list-style-type: none"> • Engagement and journey is important • Find what’s in it for them? • They need to be part of the decision process • It’s got to be better • Transparency (total)
Collective recognition	<ul style="list-style-type: none"> • Agreed upon definition of just culture is the best practice/solution • Assessment (need consensus of assessment) • Analysis of situation • Engagement is process • Trust is the outcome

Step 4: Identify means to overcome the most significant obstacles

Finally, groups were asked to identify 1 or more most significant obstacles and identify how these could be overcome. The obstacles selected and ideas for all 8 breakout groups are as follows:



Table 5. Significant obstacles and how they might be overcome

Obstacle	How to overcome
Resistance to change	<ul style="list-style-type: none"> • Repeat message • Explain why • Support change • Constant executive-level engagement • Sense of urgency • We don't plan
Culture of blame	<ul style="list-style-type: none"> • Educate • Hard look in the mirror • Recognize it exists • Learn to trust • Create an environment to trust • Humility • Open dialogue; engage
Hierarchy	<ul style="list-style-type: none"> • None identified
Trust (developing trust)	<ul style="list-style-type: none"> • Clear goals • Empathy • Commitment • Transparency/openness • Keep your word • Make the necessary changes (tough to do; may be in the eye of the beholder)
Legal process/systems	<ul style="list-style-type: none"> • Running the safety management processes, documenting, and presenting to the regulator • Keep the safety subject matter experts in the room/process as long as possible. And keep the others out as long as possible. • Dialogue • Consideration of the larger goal of the safety management system • Lean toward the non-punitive
Fear of change/denial/resistance	<ul style="list-style-type: none"> • Emphasize the benefits of just culture • Frequent and open communication • A commitment to allocate sufficient resources: fiscal, human and time • Education • Seek out leaders from both employees and management to bring message forward (i.e., champions from both sides) • Measure results • Celebrate success
Lack of trust	<ul style="list-style-type: none"> • Safety workshops—communication • Need to convince staff that you are doing what you are saying, believe it, and keep showing them that you are doing what you are saying



Obstacle	How to overcome
	<ul style="list-style-type: none"> • Involvement at all levels (management and employees in same room) • Education
Fear culture	<ul style="list-style-type: none"> • Listening (past the no) • Understand where it comes from • Provide the safe space • Follow up on incidents and communicate that follow-up with everyone
Silos	<ul style="list-style-type: none"> • People must be engaged, must share the big picture; communication plan • Build bridges—work in someone else’s job • Follow-up necessary • Employee exchanges; place them in their objectives • Ensure that everyone understands how their work fits in with the organization; where everyone fits in with the organization
Resistance to change	<ul style="list-style-type: none"> • Involve employees—feel part of change • Feel full support at all levels • Down and back up (vice versa) • Practical beats process if it makes sense • Ownership and empowerment all the way through • Recognize success when working—no black hole
Not specifically identified	<ul style="list-style-type: none"> • Holding people accountable • Understanding everybody’s perspective and have training on that (on how long until track is ready? Really means just that; not putting pressure or asking to take unsafe shortcuts) • Right people in the right spot—reorganizing? • Making them part of the solution, instead of imposing • Training • Communicate and be consistent in your message
Agree on definition	<ul style="list-style-type: none"> • Need to consult
Requisite imagination	<ul style="list-style-type: none"> • Easy to do after the fact • Hindsight is 20/20—but how do you prevent the occurrence?
Lack of alignment	<ul style="list-style-type: none"> • Depends on size; easy when directed • Most difficult for some • Self-exclusion—set people a drift if they don’t align
Lack of trust	<ul style="list-style-type: none"> • Will was there—trust was not • Trust was there for some



Appendix B: Output from Session 2

Maintaining confidence in your system while encouraging information flow—what would you do?

The purpose of this session was to encourage an open and frank discussion about the limitations of discipline to change behaviour and how to maintain fairness and transparency in safety processes. It followed the first part of a keynote address by Jack Davis, during which a health-care case study was presented (involving a drug administration error).⁴

Objective

To encourage an open and frank discussion about the limitations of discipline to change behaviour and how to maintain fairness and transparency in safety processes.

Process

- Brainstorm actions you would take immediately and sometime later.
- Identify the actions where group was in agreement or there was differences of opinion.
- Identify the most cohesive and the most contentious idea to report back to plenary.

Steps 1 and 2: Actions to take and level of agreement among group

Having received the information about what happened in the case, participants were asked to discuss what actions they would take, in the immediate term and sometime later, to handle the situation. They were asked to keep 2 competing demands in mind—appearing to be taking action while encouraging the flow of safety information.

After identifying the actions, groups were asked to identify the degree of agreement on the action, specifically identifying those actions where there was full or close to complete agreement, some difference of opinion, or very little agreement.

The actions identified for all 8 groups are described in the table below, and categorized by the degree of consensus of the group specified.

⁴ The information provided in the appendices includes the notes for all 8 breakout groups. Minimal editing has been performed to maintain the integrity of the ideas as presented by participants. For the same reason, duplicate ideas from multiple groups have not been combined.



Table 6. Actions to take immediately or later, showing degree of consensus when any was specified

Immediate actions	Sometime later
<p>Close to complete consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Cross check procedure • Hire a crisis communication firm • The CEO is to be seen dealing with it • Buy time • Empathy • Organize communication • Ensure risks illuminated or controlled • Launch internal investigation • Rally troops – demoralized troops • Facts not opinions • Reach out to NOK • Obtain clear facts • Communicate condolences • Communicate the intention of the process to investigate • Stop the damage, identify scope, deal with the immediate hazard in your system (with what you know) • Critical incident stress management for staff /employees & families & affected • Activate Emergency Response Plan • Monitoring others communications & speculations • Activate emergency response plan including: <ul style="list-style-type: none"> ○ Activate emergency response team ○ Stabilize facility in measured way ○ Stop dialysis if possible ○ contact board, insurance, Public relations/Legal council ○ Notify insurance underwriters • Involved in the event, family support and separate isolate • Commence plan. • Remove the individual from service. (You don't want them to badly influence others) and conduct investigation • Inventory check (in the Health Care case) – are there any drugs similar? Scope of type of medication. Done across the company • Lock out and Tag out • Ask them what happened to understand their side of the story 	<p>Close to complete consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Investigation into why • Communicate constantly, lay out a clear communication plan with expectations for timelines, process steps • Communicate the results of the investigation • Investigate to find root causes <ul style="list-style-type: none"> ○ Recreate what occurred Reviewing procedures to eliminate future occurrences • Initiating corrective actions, and explain to Minister and the public. • Communicate • Thorough investigation to all agencies involved to fully understand. • Regular updates to the media. • Non-punitive exercise • Provide progress report from CEO, health organization, regulatory body • Union will protect members • Develop plan for opening dialysis unit for getting patients back in • Reassure public of safety of hospital <ul style="list-style-type: none"> ○ News conference ○ Be honest with the facts • Don't cover it up • Don't fall into trap – don't assign fault or blame • No speculation • Just listen – talk – communicate, talk to staff - get information <p>Some consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Consider: risk analysis regarding the particular operation ie the ICU process, the flight route, the aircraft, the ship/vessel (eg stop/continue/modify?) • As soon as aware, communicate with industry colleagues and organizations about potential problem. <p>Little consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Consider discipline after the investigation. (table was really reluctant with this. They had to be



Immediate actions	Sometime later
<ul style="list-style-type: none"> • Do staff meeting; to make sure they know what happened and make sure they know to follow policies. Cross check the procedures • Prepare communiqué. • Bring in CISM support <ul style="list-style-type: none"> ○ Take care of your people ○ If they want to go home – go; or take care if they don't want to come in • Activate situation centre • Shut down operation that caused accident in first place until they have a review • Remove the people in the name of safety – not because of punishment – protecting hospital • Move/transfer patients • Report to necessary authorities • News conference • Fill the void • Shape messages • Reach out to the families • Bring third party support – to isolate ICU team who was working – don't want to be seen as protecting itself • Kick off investigations asap – with a recognized expert for the investigation • Make contact with other affected parties – suppliers – service providers (e.g., Baxter) • Communicate with union – protect people • Notify police <p>Some consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Deploy to the site (if possible) • Consider risks analysis: safety stand down (not really disagreement but was pointed out that not every organization can stand down completely) • Whatever happened need to address the issue; if it is removing the person • Apologize and say that you are looking right into it • Do something to differentiate that medication from the rest so that staff know about it • Stop dialysis <p>Little consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Call the manufacturer and ask that they contact everywhere they delivered it to advise 	<p>prompted.)</p> <ul style="list-style-type: none"> • Media updates planned periodically. <p>No consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Share transparency – even if legal resistance - outcome • Set schedule of media briefing update • Becomes predictive • Ask how to organize ourselves • Warnings missed • See if anything unresolved • Seeing potential issues • Trying to figure out root causes (... find the holes in the swiss cheese) • Convene investigation • Procedural review • Pay attention to contributing factors • Review procedures along the supply chain • Encourage other people to come forward with other incidents • Start the information flow • Continue communications with your stakeholders • Clear communications plan (... who is going to say what) • Executive patience required • State the obvious that Safety is Priority One • Have to be genuine • Follow up with other health care facilities to share data ... has this happened before ... could it happen again • How do you encourage cooperation? <ul style="list-style-type: none"> ○ Follow process ○ Trust to determine what happened • Transparent, tell the truth, manage speculation • Take personal responsibility • Manage public expectations • Consider corrective actions long term and implement corrective actions. • Arrange for counselling both for self and employees/families • Reach out to the families • Do risk assessment • Internal investigation, but may choose to have an external consultant to review findings



Immediate actions	Sometime later
<p>No consensus of the group was specified on the following items:</p> <ul style="list-style-type: none"> • Get drug packages clearly marked. • Take away opportunity to make this mistake again • Establish a procedure • Call producer to find out why the packaging was as existed • Investigate what happened • Determining if workload or fatigue was an issue • How to make sure it does not happen again • Remove the immediate risk • Channel the communications through one place to avoid mixed messages • Taking care of the people - EAP – employee support (involved employees on leave / substitution) + family relations • Develop internal and external communications plan • Do not jump the gun ... avoid placing the blame • Reach out to involved parties (Regulators, coroners) • Set up incident command center • Immediate communications to other hospitals • Involve legal services (... claims, insurance) • Stop action until I am comfortable (... or you can control the situation) • Was it the right product in the right box? • Provide support for people (internal) investigating • Manage the media, social media, regular media • Communicate with employees & regulators • Transparent, tell the truth, manage speculation • Take personal responsibility • Communicate internally about the realities of the fallout of an accident • Employees at centre of event: drug testing, hold out of service with pay, return “home” or head office • Formulate media statement <ul style="list-style-type: none"> ○ Give facts ○ Indicate that will investigate • Internal Communication <ul style="list-style-type: none"> ○ Responsible leader needs to be at the forefront ○ In writing need to instruct all employees not to make statements or speak to media about the issue – the spokes persons should represent the organization • Expressing empathy for what happened 	<ul style="list-style-type: none"> • Advise public/press conference <ul style="list-style-type: none"> ○ Need to identify to public is this an isolated issue or is it a systemic issue • Communicate with legal department • Provide a report to governing body • If circumstances warrant → resign after the crisis • Leader takes accountability for the safety system • Notify the pharmaceutical company of the potential to confuse the drugs • Do a risk assessment – does this issue extend beyond the immediate? • Initiate and conduct investigation • Use investigation results to determine long term status of the employee • Action plan to avoid future incidents • Employees just before specifics (timing key) • Employees back to work after investigation, which employees – pharmacy administration • Follow back to work process – once determined role – when they are ready • Police investigation and follow behind • Reinforce just culture • Full legal counsel available • Union cooperation • Tools • Lessons learned crisis management plan changes • Implement additional / tighten protocols. Find gaps • Training (make sure they know what they are doing), additional training if something changed • Analyze the workload of the technician, the time of their shift • Share lessons learned with other authority • Research – happened before? • Employee counseling, for your own staff and for family members. • Differentiate the boxes.. • Reassuring staff and people that we are trying to get to the root of the problem and that we are taking appropriate action • Maybe there was a near miss? Making sure that everybody that was close to the case; working in the same unit, get proper training • Get people to talk, encourage them to speak



Immediate actions	Sometime later
<ul style="list-style-type: none">• Leader → visible• Do not lay/ take blame• Reassure public that you have it under control• Call appropriate authorities<ul style="list-style-type: none">○ Local authorities○ Various jurisdictions• Remove employees from service until you can determine the cause.• Isolate the situation• Test/look at the other bags• quarantine all aspects related to the issue• non-confrontational• Engage the union at an early stage of the investigation• >Sideline< employees involved in incidents off the job –most certain take action• Stop procedures• Check internal protocol and or plan• Counselling for employees and victims family (now and also long term)• Establish who will responsible for investigation• Appoint or determine spokesperson for media• Initial investigation and short term action• Freeze site• Legal advice• Examine stock of medication• Redirect dialysis to other patients• Engage backup employees to take over the sideline people• Halt all treatment• Understand what happened.• Assess damages• Communicate once conduct investigation.• Demonstrate condolences• Statements about investigation, ownership. Social media, internet and external first before external comment to keep updated.• Look across• Management takes responsibility• Lockdown, risk management to continue treatment for others• Criminal or not, who to isolate, how far.• Lock down info training records, all details, working with officials• Face to face internal video conference.	



Immediate actions	Sometime later
<ul style="list-style-type: none"> • Hospital Board involved and calling the shot • Tylenol case–tell everyone what they knew–tell everyone what they didn’t know 	

Appendix C: Output from Session 3

How do you find trouble before trouble finds you?

The purpose of this session was to identify best practices in proactive safety management. The session followed the panel discussion on the morning of the second day, which included presentations on the use of proactive safety data and processes.⁵

<p>Objective</p> <p>To identify best practices in proactive safety management.</p>
<p>Process</p> <ul style="list-style-type: none"> • Brainstorm on the following issue: <i>“To help people get better at identifying and mitigating hazards without having incidents or accidents we need to ...”</i> • Identify main themes. • Select themes to report back to plenary.

Step 1: Brainstorm best practices for proactive safety management

In the first step, participants were asked to identify best practices in proactive safety management by completing the following statement: “To help people get better at identifying and mitigating hazards without having incidents or accidents, we need to....”

The ideas generated for all 8 breakout groups are presented below:

- Institutionalize the right to speak freely
- Procedures (checklists)
- See something, say something
- Education (up and down) intergeneration
- Continued improvement
- Monthly meetings with committee
- Non-punitive
- Auto-analyze
- Everyone’s business

⁵ The information provided in the appendices includes the notes for all 8 breakout groups. Minimal editing has been performed to maintain the integrity of the ideas as presented by participants. For the same reason, duplicate ideas from multiple groups have not been combined.



- No information that is not useful (pas d'information inutile)
- Data like near-miss reports, accident stories
- Investigation reports
- You don't know what you don't know
- Act on what you do know
- Technology—people (human factors)—process supported by data (analyze and validate the data)
- Unintended consequences of technology—changed behavior to avoid events—may cause other events (e.g., spooling newer engines created unstable approach; changed standard operating procedures)
- Technology should not make the decisions: people make the decisions
- Provide people with the data (e.g., animation based upon data)
- Culture: distinguish safety (the most important thing) vs. labour issues
- Training, building relationships
- Sharing safety as a common objective; single-mindedness between union and management
- From a management perspective, you have to let go. When you have access to data, in the interest of safety, let go of the traditional stuff. Don't get lost in the details of everything.
- Safety promise: company not there to monitor
- Introduction of voyage data recorders post-accident: initial resistance from crews, now data used as a training tool; create scenarios; team/employee ownership of building the scenario and learning event
- Protect the stuff: why are things released
- Prohibitions of *CTA/ISB Act* (jurisdictional use of data)
- Pushback on use of recordings
- Have to be smart
- Change behaviour: input from employees
- Maintain ability to use data to change people's behaviour (e.g., criminal behaviour)
- Shared responsibility
- Fit for duty: drug and alcohol impairment; testing post-incident; if you can't explain behaviour, then testing is permissible
- Need leadership from regulators for drug/alcohol testing; retina scan, ability to use data such as voice/video—especially if prohibition precludes taking action when they should
- Running crewless trains
- Balance issue; can use more technology than we do: how to achieve that balance
- Provide coaching to crews based on review of data to improve performance



- Do employees have too much info to absorb from technology, vs. inability to operate when technology not available? (e.g., San Francisco B777 accident)
- Investigation boards exploring internal monitoring of its processes (need a dashboard)
- Change management risk assessments: ongoing proactive risk assessments as the business changes
- Job and safety briefing, before tasks
- Job safety analysis (for particular tasks)
- Learning from others/intercorporate communications (some informal)
- Trend analysis (can trigger risk assessment)
- Education: educating people on the big risks (give staff statistics on top 6 dangerous activities)
- Near-miss reporting
- “Requisite imagination”: devote resources for proactive risk assessments: e.g., fatigue issues, low-time pilots
- Need system to follow through to risk assessments implementation (this can take days or years)
- “Chronic unease”: focus on things that are out of the norm (parameters, activities, change variance; “today, something is different, so...”)
- Data: incident reports, weekly safety call, efficiency tests related to procedures, safety management system (SMS), quality assurance, maintenance and training data connected to quality assurance and SMS
- Processes: recognizing and rewarding the use of stop work
- Data gap: don’t capture all data on work cycles (e.g., shift cycles for people on board vessels) Who should do it? Companies or government? Privacy issues
- When there is an injury, we involve employees to re-enact the occurrence with a small team
- Independent outside audit to test your system: are these really effective for looking at operations?
- How data is used: identify risks, study more, collect more data
- Risk management training and expertise: perishable skills
- Implement an enterprise-wide risk management process
- Involve all levels of the company in the risk management process
- Implement a safety management system
 - Integrate data and convert to usable information; use proactively
- Have to earn the trust of the employees and respect their dignity and their information: this will allow the system to grow
- Have convertible and available data



- Empower employees by giving them responsibilities in hazard recognition (e.g., peer review)
- Safety parameters provided/developed by management and employees
- Daily expectation that safety is #1
- Communicate regularly the good and the bad—safety goals
- Engage the customers; look for applicability to other locations
- Involve a third party to get their input and apply to your set standards
- Provide training to employees (once parameters are set)
- Provide relevant data to appropriate group for them to identify hazards
- Provide an incentive for reporting hazards
- How to analyze the data properly and effectively
- Have sufficient data and the right data: make sure you have the right environment; thorough environmental scan to identify the scope
- Periodic reviews of the environment so that the hazards are not new or changing environment
- Information: what are you aware of right now, trends of information; categorizing data; long-term analysis
- Apply analysis methods according to operational needs, short-term needs, long-term needs
- Address any legal and union obstacles to fully used data
- Make reporting easy: reward it; ask the right questions
- Provide meaningful feedback
- Communicate these: reporting being transparent
- Need to do link between reporting and risk assessment
- Specific scheduled periodic review of risk assessments
- Have a third-party audit or get a third-party view
- Who is doing the risk assessment? You need both sides or to include all levels: management, labour, etc.
- Ensure communication between the groups is good
- Process must clarify identify hazards, mitigation, and risk
- Follow-ups on the risk assessments and that what you implemented is working; are measures working?
- Implement software to analyze extensive amounts of data and communicate
- Stakeholders involved in risk assessment
- Competent people, trained
- Collect and analyze data



- Make pertinent data accessible to people
- Criteria —indicators: leading and lagging
- Define incident
- Relying on other people's experience: benchmarking; small data pool aided by larger data
- Develop and use tools, technology to gather and monitor, assess and measure
- Conduct internal audits using people from other departments and pretend they are passengers
- third-party assessments audits
- Provide data/results to others by providing examples of what others have learned
- Something new or changes, triggering risk assessment. People or technology or environment, process, standard operating procedures.
- Share information through documents with sign-off process
- Show results of reporting by responding back to those who report and to all
- Power off why: to build requisite imagination
- People defining criteria that is live and evolving
- Power of what if?
- Think outside the box: highlight and encourage this activity
- No end state: good we're safe. Don't let guard down.
- Think for themselves; learn from others
- Education and training; proactive elements
- Develop a peer-to-peer program
- New employee walkabouts, orientation program; walkabout by staff who know the job
- Hazard identification assessments; with a checklist to know what to do; scheduled in advance
- Scheduled evaluations of your processes: cross-functional
- Learn from competitors, best practices (competitors' customers; bench marking)
- Health and safety committees are key; especially in communicating awareness
- Easy-to-use reporting system
- Identifying, tracking, analysis, and sharing of data trends
- Using new tools (social media) to learn about what others are doing and what is happening elsewhere
- People may not understand what a hazard is: offer training. You want to hear about all of those potential hazards. Better to define what hazards and threats may be. Identify the triggers and ensure that staff is aware of what to report.
- Risk assessments/failure modal analysis



- Innovative use of software
- Changes; process controls: determine which investments should be made
- Do drills, simulation, practice exercises; table tops
- Ask questions
- You have to look
- Slam: stop, look, analyze, and manage; camp
- Continuous education: use every tool available
- Finding creative ways to reinforce message
- Celebrate success
- What does good risk assessment look like?
 - Employee-based and up
 - When talking about process, you want to keep it high level
 - Don't overcomplicate
- What mitigating steps do you take?
 - Reinforce process with communications
 - Don't skip steps
 - Share lessons learned; what went wrong
 - Share best practices
 - Peer-based task observations (or from all levels)
 - Post-activity analysis
 - Talk to employees: What happened during your day that you didn't expect
 - Doing client-satisfaction survey
 - Internal audits
 - Ensuring you use and analyze the wealth of data well
 - Mine your data
 - Define your systematic safety risks properly
 - Constant improvement of your system
 - Human capacity to deal with new technology
 - People: validate behaviour
 - Need to figure out what the company needs and how that translates to the company (what's in it for them?)
 - How we translate to management, workforce
- Where is the data coming from? Need to identify this: flight data monitoring or interviews
- Need to identify what you are measuring: develop metrics and then monitor
- Need to validate data
- Within the system, need to be able to develop data and convert this data into information (i.e., analyze data and use the results)



- Develop the process incrementally: as a starting point, get the most gross deviations from the norm and use those as a starting point. Catch the biggest offenders and that way you can begin to change the culture.
- Only some employees are rogue; this is the exception
- Need safety parameters identified as being best practices that can be measured against
- Must start with proper safety policies and parameters identified
- Use data from 1 hazard to examine the potential for the same hazard to apply in other locations
- Regular flow of statistics to all employees
- Need to identify what are the key barriers/actions (precursors) that should be monitored that may indicate a potential problem
- How do you see the blind spots? Third-party input may assist with seeing things you may not see from within the organization.
- What is the standard if we are using third-party reports? Does the third party know what is safe or what the standard is? Need to be able to validate against set standards to see if there is value to third-party report. At the least, it may be a signal to look more closely.
- Do you provide employees with safety data and have supervisors look at the on-time data? Employees would be more interested in safety data, managers/supervisors in on-time data.
- Ease of reporting: e.g., an app to take a quick photo and then get back to it later
- How do you get employees to see the hazards in what they are doing?
 - empower employees by giving them responsibilities in hazard recognition (e.g., peer review)
 - e.g., have pilots set up peer review committees to set standards of their own
 - safety parameters provided/developed by management and employees

Step 2: Identify main themes

From the ideas generated in step 1, participants were asked to identify 1 or more key themes and summarize what the theme included. The main themes identified by all 8 groups are presented in the table below.



Table 7. Main themes in discussion on proactive safety management

Theme	The focus of the ideas in this theme is...
<ul style="list-style-type: none"> • Shared responsibility (everyone’s job) • Culture (see something, say something; create reflexes; educate) 	<ul style="list-style-type: none"> • System including process (meetings); quality assurance (analysis, audit, continual improvement)
<ul style="list-style-type: none"> • Balance of technology flow, people, and process 	<ul style="list-style-type: none"> • Optimize technology to drive information on process and people. When do you have/how do you maintain balance? Each helps manage the mix.
<ul style="list-style-type: none"> • Voice and video 	<ul style="list-style-type: none"> • Smart use of...
<ul style="list-style-type: none"> • Education and training 	<ul style="list-style-type: none"> • Risk awareness and involvement
<ul style="list-style-type: none"> • Monitoring many sources of information 	<ul style="list-style-type: none"> • Trigger analysis of risk (small or big) and implant preventive measures: can be task based or organization wide
<ul style="list-style-type: none"> • Robust safety management system 	<ul style="list-style-type: none"> • Data and information • Transparency and communication
<ul style="list-style-type: none"> • Make information visible • Make that goal visible and tangible and set goal, make it real • Focus on the people at all levels 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • People • Processes • Technology 	<ul style="list-style-type: none"> • Empowering them to think about what if and why? Find solutions, part of the system. • SMS structure: improve better outcome • Continually improve system
<ul style="list-style-type: none"> • Employee engagement 	<ul style="list-style-type: none"> • Health & safety committees
<ul style="list-style-type: none"> • Data 	<ul style="list-style-type: none"> • Robust reporting • Mining • Sharing
<ul style="list-style-type: none"> • Commitment 	<ul style="list-style-type: none"> • From everyone in the company that something needs to change; culture • Building trust
<ul style="list-style-type: none"> • Vigilance 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • Education/training on advance safety principles 	<ul style="list-style-type: none"> • From health & safety committees • Investing in your people



Appendix D: Output from Session 4

Data sharing: How do we maximize use of voice/video to improve safety while balancing rights and obligations

The purpose of this session was to have a discussion on the use of voice and video data to improve safety, overcoming obstacles to the use of such data in a way that is respectful of rights and obligations. This session followed an update on the locomotive voice and video recording (LVVR) pilot study and a presentation by the TSB chief operating officer outlining the legal and other considerations in expanding the use of voice and video data.⁶

<p>Objective</p> <p>Identify means to capitalize on opportunities and overcome obstacles in using video/voice recordings for safety purposes.</p>
<p>Process</p> <ul style="list-style-type: none"> • Develop a list of likely uses: How would you make use of voice/video data to improve safety if they were available? • Determine proportion of group who would likely use data for this purpose. • Develop list of obstacles for the use of voice/video data. • Identify means to overcome most significant obstacle. • Repeat for other obstacles. • Identify points to report back to plenary.

Steps 1 and 2: Develop list of likely uses

In the first step, participants were asked to identify the anticipated application of voice and video data for safety purposes by answering the question “How would you make use of voice/video data to improve safety if they were available?”

Groups were also asked to identify the proportion of participants who could envisage using voice and video data for this purpose.

The output from all 8 groups for these 2 steps is below. All ideas are presented, and categorized by the degree of consensus of the group specified.

Close to complete consensus of the group was specified on the following items:

- Element of proper incident investigation which can lead to learning

⁶ The information provided in the appendices includes the notes for all 8 breakout groups. Minimal editing has been performed to maintain the integrity of the ideas as presented by participants. For the same reason, duplicate ideas from multiple groups have not been combined.



- Understand issues (eg fatigue) driving safety investigations (pipeline – they have video in control room but not voice. Would be useful to have voice).
- Look at other sectors like banking where voice recording is used for quality purposes and see what they are doing. Take away the drama
- Use to validate information (pipeline)
- Validate performance during safety investigation
- Proactive compliance monitoring (random, what is occurring and why)
- Events could trigger use of video (eg exceedances)
- Monitoring of normal operations (like airline Line Operations Safety Audits (LOSA))
- Event recorder for efficiency test (random – pass/fail – on individual and on system)
- Training – look for systemic trends and build into training. Also use video recording as examples during training
- Better more accurate data about what happened and more rapidly available
- Security (benefit for employees)
- Compliance monitoring X 3
- Incident reconstruction. absolute evidence
- Mindset / Readiness of crew acceptance / Buy-in

Some consensus of the group was specified on the following items:

- Employee safety report (validation)
- For the TSB's use
- Training and Education
- Investigations
- Confirmation that correct procedures being followed
- Best practices, how they handled a situation.
- Identify opportunities for efficiency to be improved (not short-cuts but better ways).
- Seeing somebody doing their task; and seeing ergonomically what they are doing.
- Identify additional hazards that employees are subjected too.
- Enhances observation
- Cost savings (i.e. fuel)

No consensus of the group was specified on the following items:

- To react to events: training; procedures; investigation; establish best practices; amend Standard Operating Procedures; equipment improvements;
- Training – chance to look at real life scenarios to look at (a) proper way to do something and non-proper; fine-tune best practices; data for simulator use.



- Internal auditing – consistency with policies and procedures
- See normal behavior
- Security purposes
- Question – using cameras for a safety purpose, where is the most appropriate place for them?
- Added understanding of “why”.
- Help fill the gap between the perception and the reality of what happened.
- To protect employees and companies.
- Focus and define use. (pipeline)
- Use – study shift handovers (pipeline)
- There is a benefit for management & staff (outward video)
- Post-incident
- Random monitoring of compliance
- Tool as part of SMS – use voice video recording as data source within the bounds of your SMS.
- From employee perspective, in some cases having a recording will provide understanding of the event
- To aid in investigation process
- Training (- simulation video) to self-assess
- Post-accident investigation
- Quality assurance purposes
- If hazards identified, determine if problems with procedures
- Not sure if it would improve safety
- Augment the existing TSB legislation
- Audio recording will pick up extra noises
- Video – external forward benefits objective information
- Will enable to see persons action
- Trigger events – abnormal or serious events
- Determine why / how
- Educational awareness
- Add a layer of SMS
- Opportunity to engage unions and regulators based on findings.
- Health and safety committee



- Fatigue recognition. \Texting and electronic distractions. Compliance monitoring to corporate process
- Build training – learning opportunities
- Help to determine what to do differently in a particular subdivision
- Tying in with GPS video recording correlation
- Learning
- Near-miss investigations
- Ability to investigate smaller incidents
- Continuous improvement
- Root cause determination
- Have more factual information – you don't have to guess
- Get you to the truth – facts speak for themselves
- Evaluation of consistency – procedure; random sample; training
- Reduce the “white coat” effect –you forget you're being watched
- Bridge resource management
- Use for internal purposes – he said/she said
- It exonerates people
- Clear picture of actual operations
- Use to orient new staff
- Identification of prohibitive behaviour

Step 3: Brainstorm obstacles

In the third step, participants were asked to develop a list of obstacles to the use of voice and video data recording for safety purposes. The output for all 8 groups is below:

- Suspicious of information falling into the wrong hands: used for the wrong purpose
- Resources: lack of appetite for some rogue operators; no value added
- No real estate or infrastructure
- Union agreement based on perceived use versus actual use
- Recording, data, storage: policy considerations help set the parameters for use
- Growing sense of culpability
- Working against idea that it will be used only for prosecution
- *Privacy Act*: for those people who may be on the video
- Current legal environment: “sue first and ask questions later” and “sue everyone”
- Acts, regulations (privacy, use, etc.)



- Protocol, rules re: how the technology is used
- Labour groups' privacy and other concerns
- Safety-sensitive area
- Different stakeholders with different mandates and responsibilities (alignment of government)
- Mode by mode vs. all modes (all or nothing, *TSB Act*?)
- Unionized vs. non-unionized
- Perception that it will be used for punitive action
- Concept of rights and obligations
- Data not protected (fear of)
- Use of voice/video is limited to post-incident
- One-size-fits-all regulation approach
- Legal repercussions
- Effect on safety partnership
- Cost to implement
- Noises might make things hard to hear
- Human rights legislation: lack of clarity, can't do it, privacy
- Cost
- Protecting controlling usage protection access: destruction
- Usefulness: how we capture may not give us the answers re: human factors
- Degradation: i.e., distracted
- How is this going to look?
- The laws
- Privacy
- Risk aversion
- Employee reluctance and opposition
- Labour relations
- Concern over use
- Cost
- Labour to manager data
- Liability
- Mindset; readiness of crew acceptance; buy-in
- Fear of the unknown



- Organized labour
- Fear of getting disciplined
- Staff would be on guard and more tense
- Regulations
- Human rights
- Collective bargaining: union issues
- Employee trust issue
- Costs
 - Technology costs money
- Legal challenges
 - Differing views from management/employees
 - Fear factor: employees fearful of being recorded
 - Analyzing all the other chatter on the bridge deck
 - Above 10,000 feet: setting parameters like the aviation example
 - Rules pertaining to talking and what's being recorded

Step 4: Identify means to overcome obstacles

In the final step, participants were asked to select 1 or more of the most pressing obstacles identified in step 3 and identify possible means to overcome them.

**Table 8. Overcoming obstacles to using of voice/video to improve safety**

Obstacle	Means to overcome
Suspicion by employees	<ul style="list-style-type: none"> • Consultation; create memorandum of understanding; not a dmissible • Need guardian • Company policy • Check what other countries are doing
No interest	<ul style="list-style-type: none"> • Show benefit • SMS follow-up (controller, operator) • Regulatory reform (consultation and feedback) • Show what other countries are doing
Lack of resources	<ul style="list-style-type: none"> • Incentive program • Data on why it's worthwhile
Not specified	<ul style="list-style-type: none"> • Revise the law • Think of other areas where this may collide/impact • Better understanding of legal parameters/limitations • What are we trying to solve and how does the law get us there? • Find out what police have been doing
Misalignment of stakeholders	<ul style="list-style-type: none"> • For government, proceed with new regulations by mode to address modal differences • Establish clear protocols, just decision matrices within SMS
Privacy	<ul style="list-style-type: none"> • Full discussion about expectations
Safety	<ul style="list-style-type: none"> • Show the security benefit post-event or proactive process of using this data • Draw on experience of how the use of this data has benefited safety in other industries (e.g., trucking, aviation, banking)
One size fits all	<ul style="list-style-type: none"> • Have different means and regulations for various types of operations (705, 703, etc.)
Distrust	<ul style="list-style-type: none"> • If culture (safety) is appropriate (i.e., demonstrated that you don't take a punitive approach), employees would be less inclined to distrust appropriate use of recordings • Process needs to be evidence based and supported by risk assessment methodologies • Ensure all stakeholders are fairly consulted • Gradual implementation
Not specified	<ul style="list-style-type: none"> • Data • Benchmarking • Other modes, ideas • Social recognition • Public safety supersedes privacy • Creates safer work environment; not distracted • Pre-existing protocols to protect • Establish to protect integrity of data • Policy on how equipment is used • Sharing lessons learned



Obstacle	Means to overcome
	<ul style="list-style-type: none"> • Involve employees in policy development protocol and lessons learned • Legislation worded to clearly address obstacles • Tracking non-compliance/baseline
Mindset/Readiness of crew acceptance/Buy-in	<ul style="list-style-type: none"> • Legal changes; framework needs to be in place; getting better protection on its use • Education: solving the questions of being concerned over use; or their fear of the unknown; change management; maybe different strategies for different age groups • Consistency in application • Limiting and clearly prescribing clear circumstances in which data cannot be accessed • “Iron-clad” protection
Human rights issue/employee	<ul style="list-style-type: none"> • Sit down with employees and come up with agreed-upon parameter(s) • Set up sandbox to play in: engage employees • Get help from the TSB • Normalizing that the recorders exist • Need to sell the idea that recorders are important • Change the law • Accept that you can never address all the challenges • Incremental approach
Legislation	<ul style="list-style-type: none"> • Slow regulatory process

Other observations noted during this session

The following points raised during this breakout session were outside the scope of the process used to guide the discussions:

- Voice in airline sector plays positive role in investigations; the video is different, as it has a host of other issues associated with it. Not sure it can be used beyond investigative process. We have used it in loft training in the simulator.
- If hazards identified, could use to assist in finding procedural issues. Not necessarily an accident or incident—could use for other hazards, problems in cockpit, etc.
- Assumption that it will improve safety. Will it actually improve safety? Yes, after an occurrence. Where is the bang for the buck: is it through recordings?
- United Kingdom study of dual image recorders determined that there was stress on pilots when video introduced, especially when recording face. Don’t think about cockpit voice recorder, but will behaviour change when and if we move to video? Even in simulator, when you first start, you behave differently knowing that the camera is on.
- There is other data like flight data recorder data that can provide relevant info in many cases
- We don’t always know if a control was commanded or uncommanded. This is where the camera can help.
- Differences in aviation sector for single pilot versus large carriers that are monitoring 2000+ parameters hourly



- Obstacle is focused around rights and obligations (CRJ in Sweden and German Wings): for Sweden, it was not supposed to be let out, as they are part of the International Civil Aviation Organization. The Accident Investigation Board also let out Super Puma recording.
- While Canada protects, other countries do not
- Use of voice/video is limited; it is really only post-incident
- Use of voice/video is limited to post-incident; cameras will never let you jump out ahead and stop anything
- Once you have video, you can imagine all the subpoenas for the footage if there were criminal and civil litigation
- Concerned about the safety relationship it may have on existing partnerships with the TSB and the regulator, as it may put industry at odds. It would be difficult for the airline industry to accept this if they don't see a major benefit.
- One suggestion is that if an industry or airline has a large amount of parametric data, perhaps there isn't a requirement to capture video
 - If an organization has a strong culture of safety (i.e., has demonstrated that they don't take a punitive approach), then they may be better able to adopt voice and video recordings