



# Provincial Silviculture Sector Risk Assessment Workshop Results

A focused approach to improving workplace health and safety

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*RA = risk assessment*

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# Risk Assessment: Introduction

In 2013 the MLITSD launched project to put in place an **integrated risk assessment methodology** to:

- Identify risks to worker health and safety & work with employers and workers on reducing those risks
- Provide more information to employers, workers & their representatives about risks at the **SECTOR** level

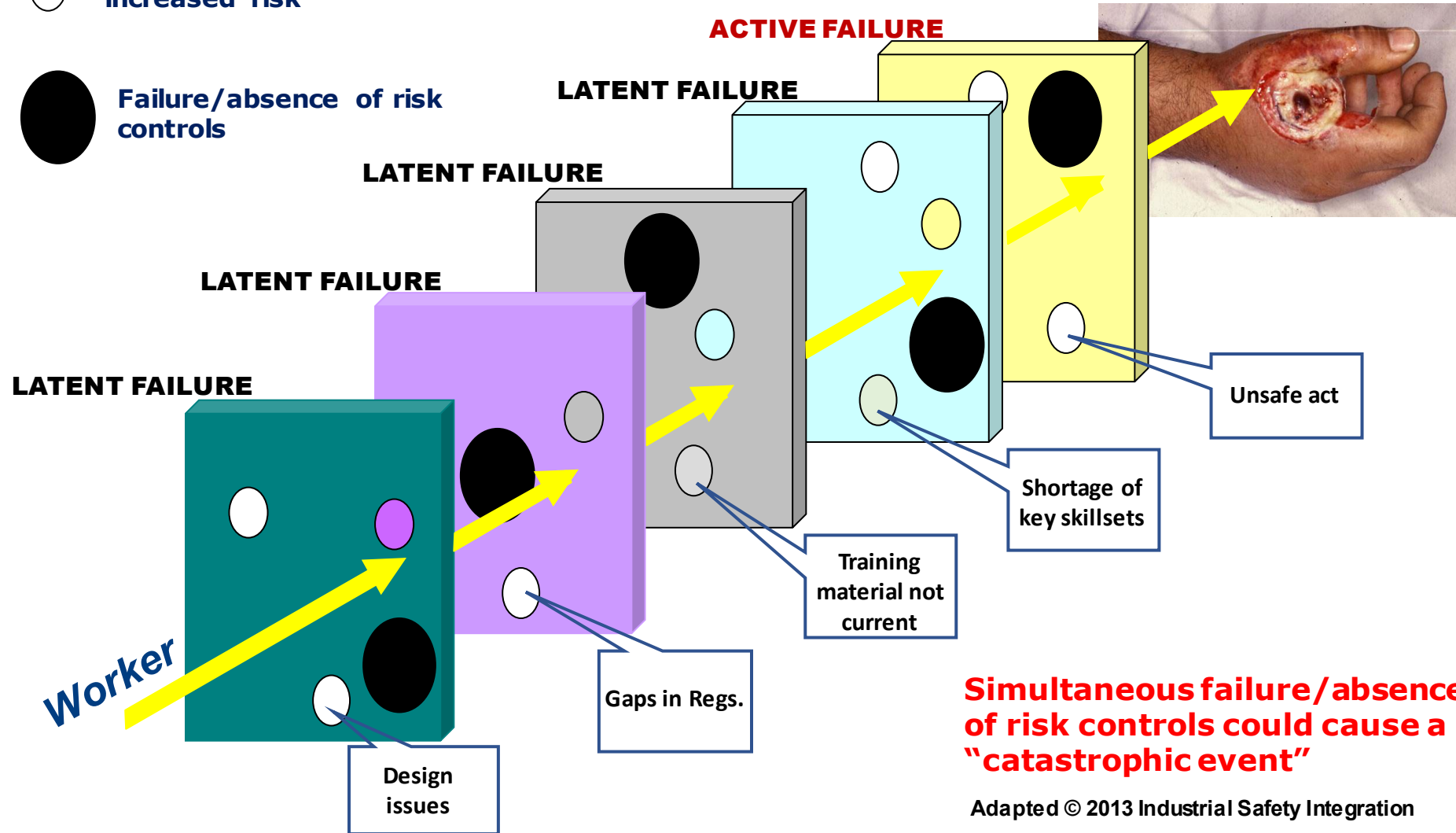
With support of the **Forestry, Paper Printing and Converting Advisory Committee** and MLITSD, WSN planned & facilitated the **Silviculture Sector Risk Assessment**

- Harness collective wisdom across the sector in a tripartite process to focus the industry, **sector health and safety association (HSA)**, and the regulator on highest risks to health and safety
- Approach draws on industry, worker, HSA, & Ministry knowledge of risk and recognizes that **one-size approach does not fit all**
- Approach draws on empirical insights of risk management & operations **research/decision science**

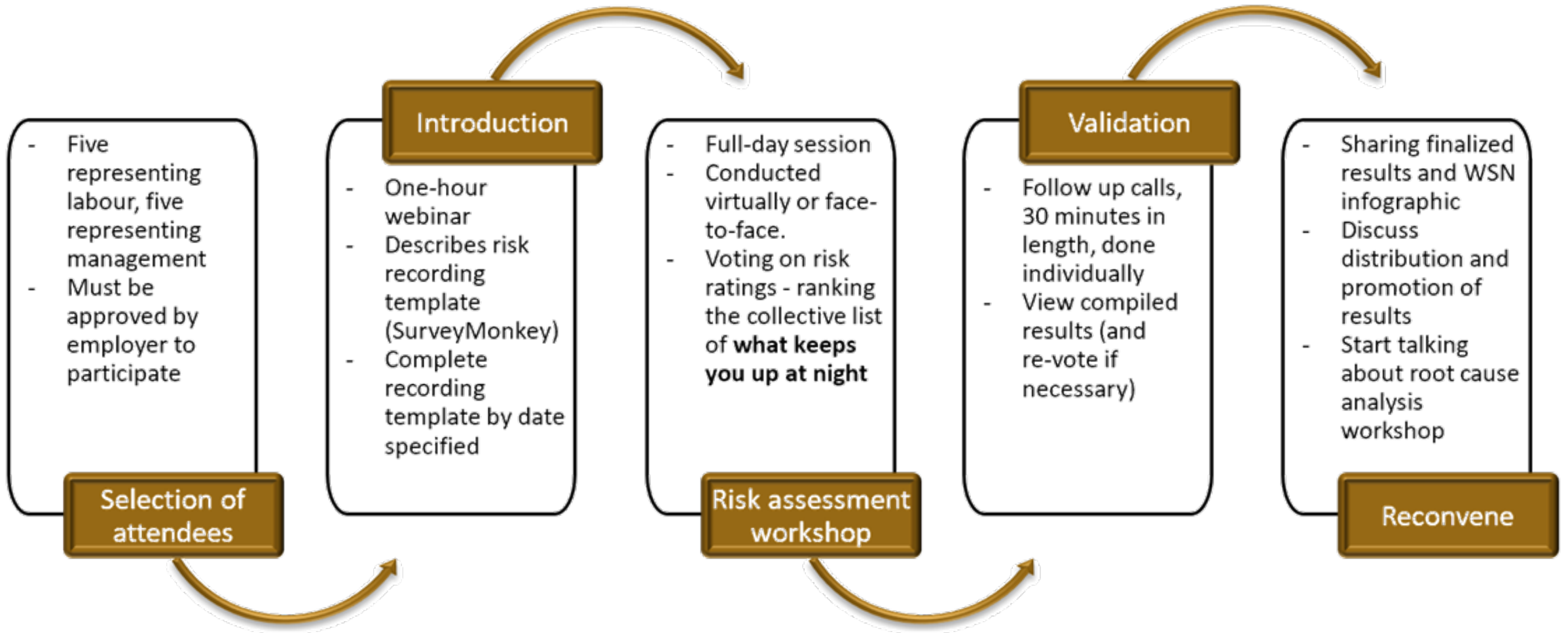
# Risk Assessment Project

○ Examples that could lead to increased risk

● Failure/absence of risk controls



# A Tripartite and Collective Process



# Workshop: A Tripartite and Collective Process

## **Workshop process was open, transparent, and collaborative:**

- Ensured any perspective or viewpoint was heard
- Each response received was respected and not freely edited
- Final list shared with workshop participants before the workshop
- Final workshop results reviewed/validated by industry participants

## **Finding acceptable solutions that all members can support:**

- Only industry experts ranked the risks, not government or WSN
- Process was NOT about consensus, although the results demonstrate a significant degree of convergence



# Risk Assessment Workshop: Attendees

## SUBJECT MATTER EXPERTS

#	Name	Company/Representative
1	Dean Cecchetto	Fisher Wavy
2	Josh Knight	Resolute FP
3	Sterling Skeoch-Allison	Haveman Brothers Forestry
4	Terron James	Greenmantle Forest Inc.
5	Caitlin Spears	Brinkman Reforestation
6	Danby Harrison	Brinkman Reforestation
7	Justin Postuma	Haveman Brothers Forestry
8	Kevin Hakojarvi	First Resource Management Group

**Worker Representation**

**Employer Representation**

## WORKSHOP PARTICIPANTS

#	Name	Company/Representative
1	Susan MacIsaac	Observer: Haveman Brothers Forestry
2	Doug Cettina	MLITSD: Industrial Program Coordinator
3	Sabrina Missere	Workplace Safety North: Facilitator
4	Tom Welton	Workplace Safety North: Support
5	Chris Serratore	Workplace Safety North: Support
6	Tiana Larocque	Workplace Safety North: Tech Support
7	Tricia Valentim	Workplace Safety North: Tech Support

**MLITSD:** Ministry of Labour, Immigration, Training, and Skills Development



# Risk Assessment Workshop: Event Categories

1. Environmental Hazards
2. Driving Hazards
3. Emergency Preparedness
4. Ergonomics
5. Slips, Trips and Falls
6. Psychosocial Hazards
7. Eye Injuries
8. Working Around Equipment
9. Brush Saw/Chainsaw Operation
10. Exposure to Hazardous Substances
11. Working Around Harvesting Equipment



# Risk Assessment: Prioritize risks

- The purpose of this stage is to assess the level of risk and establish risk priorities
- **Risk**, which is the **average Likelihood (L)** multiplied by the **average Consequence (C)** for each event, then is categorized with respective risk ratings using the **Risk Matrix (Heat Map)**

<b>LIKELIHOOD</b>	Almost Certain (5)	5	10	15	20	25
	Very Likely (4)	4	8	12	16	20
	Likely (3)	3	6	9	12	15
	Unlikely (2)	2	4	6	8	10
	Rare (1)	1	2	3	4	5
		Low (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
		<b>CONSEQUENCE</b>				

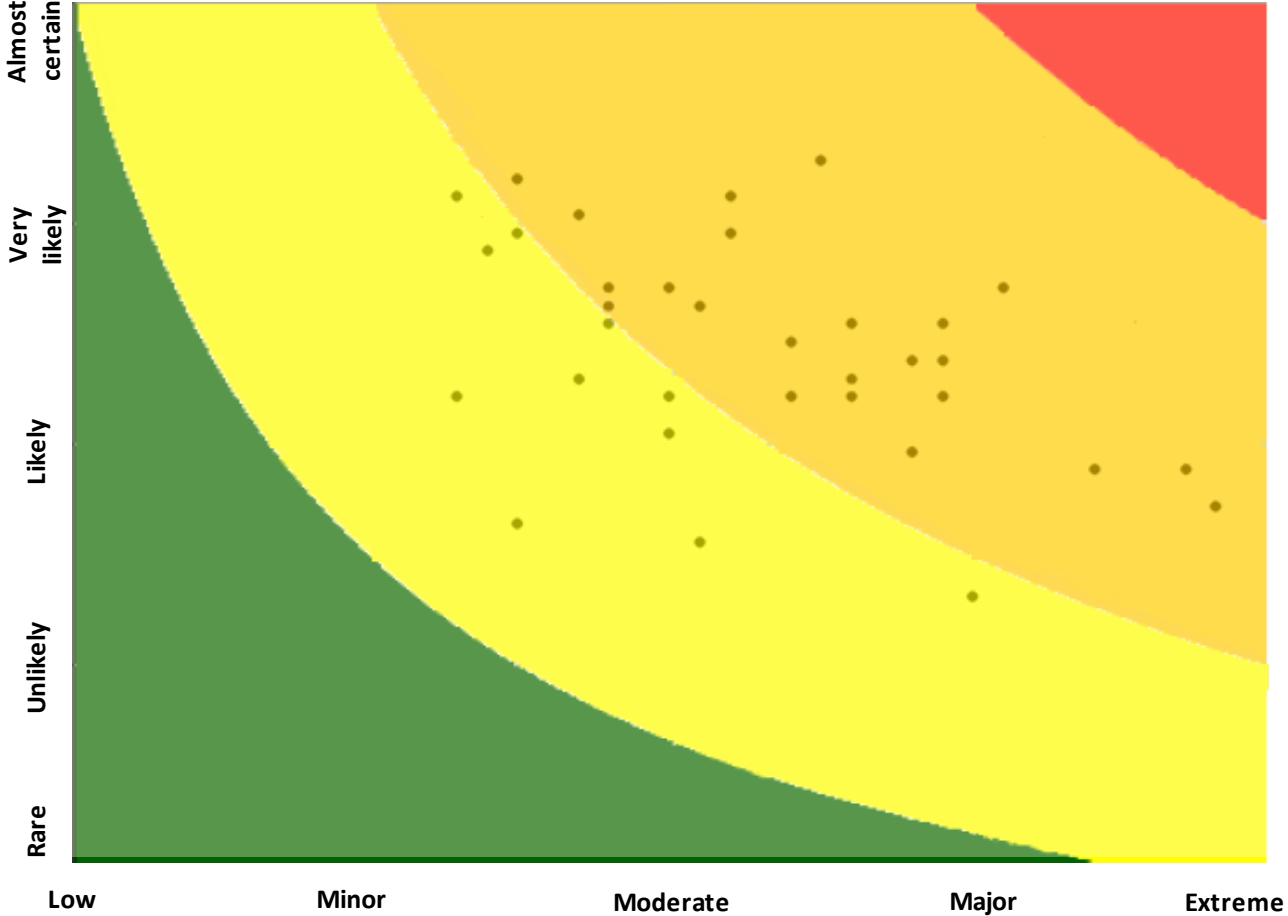
Risk Matrix Result	Risk Rating
20 to 25	Critical
12 to 16	High
5 to 10	Moderate
1 to 4	Low

# Silviculture Sector Risk Assessment: Heat Map

Risk Rating
Critical
High
Moderate
Low

Likelihood	Description
[1] Rare	Very low probability for unwanted event to occur in the next year [or less than 5% of occurrence]
[2] Unlikely	Low probability for unwanted event to occur in the next year [or between 5%-20% chance of occurrence]
[3] Likely	It is possible for unwanted event to occur in the next year [or between 20%-50% chance of occurrence]
[4] Very likely	High probability for unwanted event to occur in the next year [or between 50%-90% chance of occurrence]
[5] Almost certain	Unwanted event is almost certain to happen in the next year [or 90% or greater chance of occurrence]

Consequence	Description
[1] Low	No injury or illness [or negligible impact/importance]
[2] Minor	First aid treatment (no lost time) [or minor impact/importance]
[3] Moderate	Temporary disability (lost time): Injury/illness [or moderate impact/importance]
[4] Major	Serious event/critical injury or critical illness [or major impact/importance]
[5] Extreme	Fatality or permanent disability [or extreme impact/importance]



# Silviculture Sector Risk Assessment: Top 10 of 34 identified events

Rank	Category	Event (Situation/Condition) that could result in Injury or Illness OR <b>What could keep you up at night?</b>	Risk
1	Environmental Hazards	Dead snag trees or branches, chicots, hang ups, spring poles in cutover falling on workers	15.50
2	Driving hazards	Highway traffic incidents especially those involving transport trucks	15.23
3	Driving hazards	Unsafe driving on forestry roads	13.59
4	Driving hazards	Motor vehicle incidents, general	12.72
5	Environmental Hazards	Wind event: Standing trees falling on workers in the block with strong winds	12.72
6	Environmental Hazards	Heat stress leading to dehydration while working in hotter environments	12.69
7	Driving hazards	ATV/wheel/track machine incidents (incl. rollover; loss of control; speed; leaving the roadway; collision)	12.25
8	Environmental Hazards	Wildlife encounters or attacks resulting in workplace incident	12.19
9	Emergency Preparedness	Lack of/absent emergency planning during an incident	12.03
10	Ergonomics	Musculoskeletal injuries/repetitive strain injuries	11.88

# Silviculture Sector Risk Assessment: Top 10 risk by category

Rank	Category	Event (Situation/Condition) that could result in Injury or Illness OR <b>What could keep you up at night?</b>
1	Environmental Hazards	Dead snag trees or branches, chicots, hang ups, spring poles in cutover falling on workers
2	Driving hazards	Highway traffic incidents especially those involving transport trucks
3	Driving hazards	Unsafe driving on forestry roads
4	Driving hazards	Motor vehicle incidents, general
5	Environmental Hazards	Wind event: Standing trees falling on workers in the block with strong winds
6	Environmental Hazards	Heat stress leading to dehydration while working in hotter environments
7	Driving hazards	ATV/wheel/track machine incidents (incl. rollover; loss of control; speed; leaving the roadway; collision)
8	Environmental Hazards	Wildlife encounters or attacks resulting in workplace incident
9	Emergency Preparedness	Lack of/absent emergency planning during an incident
10	Ergonomics	Musculoskeletal injuries/repetitive strain injuries

# Worker vs. Workshop Results: Top 10 comparison

#	Category	Event (Situation/Condition) that could result in Injury or Illness OR <b>What could keep you up at night?</b>	RISK
1	Driving hazards	Highway traffic incidents especially those involving transport trucks	16.63
2	Environmental Hazards	Dead snag trees or branches, chicots, hang ups, spring poles in cutover falling on workers	16.00
3	Environmental Hazards	Wind event: Standing trees falling on workers in the block with strong winds	12.38
4	Environmental Hazards	Heat stress leading to dehydration while working in hotter environments	12.25
5	Driving hazards	ATV/wheel/track machine incidents (incl. rollover; loss of control; speed; leaving the roadway; collision)	12.00
6	Ergonomics	Musculoskeletal injuries/repetitive strain injuries	11.88
7	Driving hazards	Unsafe driving on forestry roads	11.38
8	Environmental Hazards	Severe weather	11.38
9	Driving hazards	Motor vehicle incidents, general	11.25
10	Slips, trips and falls	Injuries as a result of a trip, slip or fall in cutovers	11.25

**Worker results**

#	Category	Event (Situation/Condition) that could result in Injury or Illness OR <b>What could keep you up at night?</b>	Risk
1	Environmental Hazards	Dead snag trees or branches, chicots, hang ups, spring poles in cutover falling on workers	15.50
2	Driving hazards	Highway traffic incidents especially those involving transport trucks	15.23
3	Driving hazards	Unsafe driving on forestry roads	13.59
4	Driving hazards	Motor vehicle incidents, general	12.72
5	Environmental Hazards	Wind event: Standing trees falling on workers in the block with strong winds	12.72
6	Environmental Hazards	Heat stress leading to dehydration while working in hotter environments	12.69
7	Driving hazards	ATV/wheel/track machine incidents (incl. rollover; loss of control; speed; leaving the roadway; collision)	12.25
8	Environmental Hazards	Wildlife encounters or attacks resulting in workplace incident	12.19
9	Emergency Preparedness	Lack of/absent emergency planning during an incident	12.03
10	Ergonomics	Musculoskeletal injuries/repetitive strain injuries	11.88

**Workshop results**

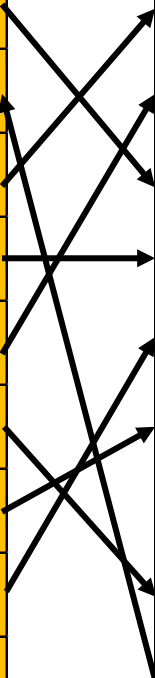
# Employer vs. Workshop Results: Top 10 comparison

#	Category	Event (Situation/Condition) that could result in Injury or Illness OR <b>What could keep you up at night?</b>	RISK
1	Driving hazards	Unsafe driving on forestry roads	15.94
2	Emergency Preparedness	Lack of/absent emergency planning during an incident	15.44
3	Environmental Hazards	Dead snag trees or branches, chicots, hang ups, spring poles in cutover falling on workers	15.00
4	Driving hazards	Motor vehicle incidents, general	14.25
5	Driving hazards	Highway traffic incidents especially those involving transport trucks	13.75
6	Environmental Hazards	Wildlife encounters or attacks resulting in workplace incident	13.13
7	Environmental Hazards	Heat stress leading to dehydration while working in hotter environments	13.13
8	Environmental Hazards	Wind event: Standing trees falling on workers in the block with strong winds	13.06
9	Driving hazards	Loading and unloading vehicles	12.19
10	Environmental Hazards	Severe weather	12.00

**Employer results**

#	Category	Event (Situation/Condition) that could result in Injury or Illness OR <b>What could keep you up at night?</b>	Risk
1	Environmental Hazards	Dead snag trees or branches, chicots, hang ups, spring poles in cutover falling on workers	15.50
2	Driving hazards	Highway traffic incidents especially those involving transport trucks	15.23
3	Driving hazards	Unsafe driving on forestry roads	13.59
4	Driving hazards	Motor vehicle incidents, general	12.72
5	Environmental Hazards	Wind event: Standing trees falling on workers in the block with strong winds	12.72
6	Environmental Hazards	Heat stress leading to dehydration while working in hotter environments	12.69
7	Driving hazards	ATV/wheel/track machine incidents (incl. rollover; loss of control; speed; leaving the roadway; collision)	12.25
8	Environmental Hazards	Wildlife encounters or attacks resulting in workplace incident	12.19
9	Emergency Preparedness	Lack of/absent emergency planning during an incident	12.03
10	Ergonomics	Musculoskeletal injuries/repeitive strain injuries	11.88

**Workshop results**



# Appendix A: Workshop Process Details

1. A sector is identified and defined for risk assessment
2. Subject matter experts (SMEs) from the selected sector are identified
3. Each of the selected SMEs list (identify) the situations or conditions (events) that could lead to injury or illness with appropriate evidence for each event (pre-workshop)
4. The lists are collected and amalgamated into one list (pre-workshop)
5. The amalgamated list is sent to each SME for review (pre-workshop)
6. A workshop is scheduled for the analysis and prioritization of each identified event on the amalgamated (final) list
7. Workshop conducted in blended face-to-face and videoconferencing format in light of necessary COVID-19 pandemic precautionary measures.
8. For each identified event on the list, SMEs contribute toward a robust discussion, generating deeper objective understanding and allowing for all perspectives to be heard (comments are NOT attributed)
9. After each discussion for each identified event, each SME “votes” (based on identified criteria/scale) to lock in a value judgement on **likelihood of the event occurring** and **severity of the consequence if the event was to occur**
10. Electronic voting tools are used to make voting easy and anonymous; results on each event are instantaneous
11. Project manager takes results to create a risk profile/heat map for the sector
12. Results validation includes “smell test” by industry SMEs before releasing final results



# Appendix B: Risk Assessment Processes/Standards

\* Not an exhaustive list

1. Bayesian Analysis
2. Bow-tie analysis
3. Brainstorming (e.g. what-if)
4. Business impact analysis
5. Cause and effect analysis
6. Checklists
7. Computer Hazard and Operability Studies (CHAZOP)
8. Consequence Analysis (also called Cause-Consequence Analysis)
9. Likelihood/Consequence matrix
10. Construction Hazard Assessment and Implication Review (CHAIR)
11. Decision tree
12. Delphi technique
13. Energy Barrier Analysis (or Energy Trace Barrier Analysis)
14. Environmental risk assessment
15. Event tree analysis
16. Failure Mode and Effect Analysis (FMEA)
17. Failure mode, effect and criticality analysis
18. Fault Tree Analysis
19. Fishbone (Ishikawa) Analysis
20. Hazard analysis and critical control points
21. Hazard and Operability studies (HAZOP)
22. Human reliability analysis
23. Job Safety Analysis (JSA)
24. Level of Protection Analysis (LOPA)
25. Markov analysis
26. Monte Carlo
27. Preliminary Hazard Analysis (PHA)
28. Reliability centered maintenance
29. Scenario analysis
30. Sneak circuit analysis
31. Structured/semi-structured interviews
32. SWIFT (i.e. structured what-if)
33. Systemic Cause Analysis Technique (SCAT)
34. Human Error Analysis (HEA)
35. Workplace Risk Assessment and Control (WRAC)

## Risk Management Standards:

1. Risk Management Principles and Guidelines (ISO 31000:2009)
2. Risk Assessment Techniques (ISO/IEC 31010:2009)
3. OH&S Hazard Identification and Elimination and Risk Assessment and Control (CSA Z1002)
4. Process Safety Management (CSA Z767-17)
5. Enterprise Risk Management (COSO 2004)
6. Global Minerals Industry Risk Management (GMIRM)
7. International Council on Mining & Metals (ICMM)





# Appendix C: Contacts

For additional information or questions, please contact:

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*Workplace Safety North*

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