Risk Assessment

Results of the LOGGING Sector Workshop - Nov. 21, 2017

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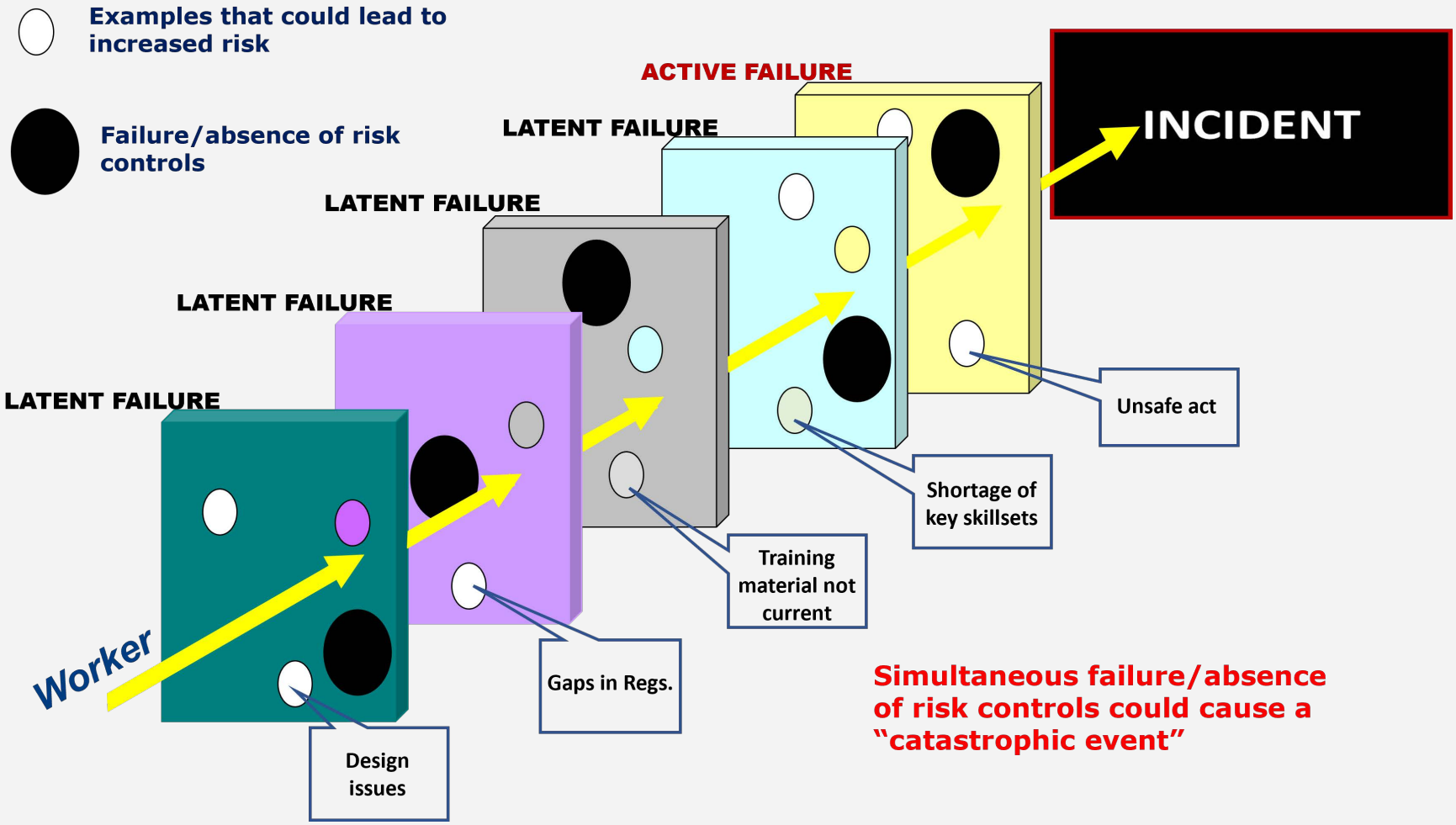
Risk Assessment Project: Introduction

- **The Ministry of Labour (MOL) launched in 2013, a project to put in place an integrated risk management methodology:**
  - To identify risks to worker health and safety and to work with employers and workers on reducing those risks
  - To provide more information to employers and to workers and their representatives about risks at the **SECTOR** level

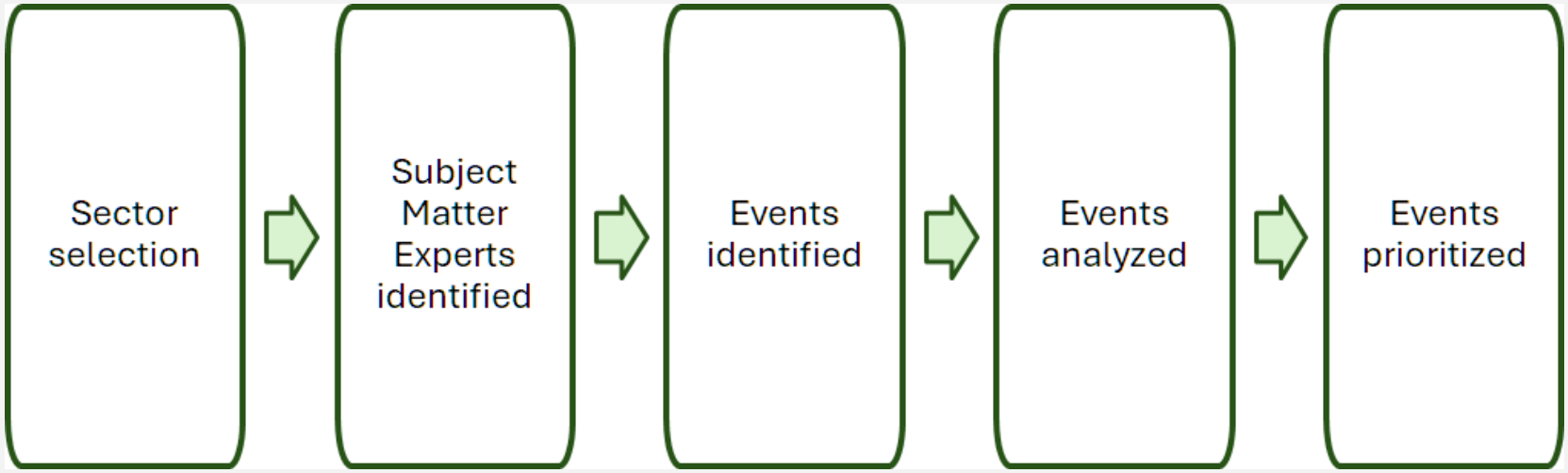
- **Harness collective wisdom across the sector in a bipartite process to focus the industry, workers and their representatives, Health & Safety Agencies (HSAs), and the regulator on the highest risks to health and safety**
- **This approach draws on industry, worker, HSA, and ministry knowledge of risk and recognizes that one-size does not fit all**
- **The approach developed for this project draws on the empirical insights of risk management, and operations research/ decision science**

Risk Assessment Project: The Subject Of Inquiry



Simultaneous failure/absence of risk controls could cause a "catastrophic event"

Risk Assessment Workshop: A collective process



Risk Assessment Workshop: A Bipartite & Collective Process

- **Workshop process was open, transparent, and collaborative:**
  - Ensured that any perspective or viewpoint was heard
  - Each response received was respected and not freely edited
  - Final list shared with workshop participants before the workshop

- **Finding acceptable solutions that all members can support:**
  - Only Worker and Employer participants voted, not MOL or WSN
  - Process was NOT about consensus, although the results demonstrate a significant degree of convergence

Subject Matter Experts: Workshop

#	Name	Company/Representation
1	Ron Isaac*	Rayonieram
2	Ted Frisby*	Resolute Forest Products
3	Steve Munro*	Westwind Forest Stewardship Inc.
4	Bryon Hall*	Fleming's Trucking & Logging
5	Paul Cloutier*	USW Local 1-2010 (Rayonieram)
6	Shaun Fisher*	Non-Union (Tom Fisher Logging)
7	Clyde Clouthier*	Non-Union (Clouthier & Sons)
8	Malcolm Grieg**	USW Local 1-2010 (Firesteel)
9	Dave Hoier**	USW Local 1-2010 (Jason Rouillard Logging)
10	Tom Welton	Workplace Safety North
11	Bernie Stockermans	Workplace Safety North

#	Name	Company/Representation
12	Allen Armstrong	Ministry of Labour
13	Ken Bilodeau	Ministry of Labour
14	Ron Landry	Ministry of Labour

#	Name	Company/Representation
15	Christine Bibby	Ministry of Labour (Workshop Tech Support)
16	Sujoy Dey	Ministry of Labour (Workshop Facilitator)

Employer representation

Worker representation

Ontario

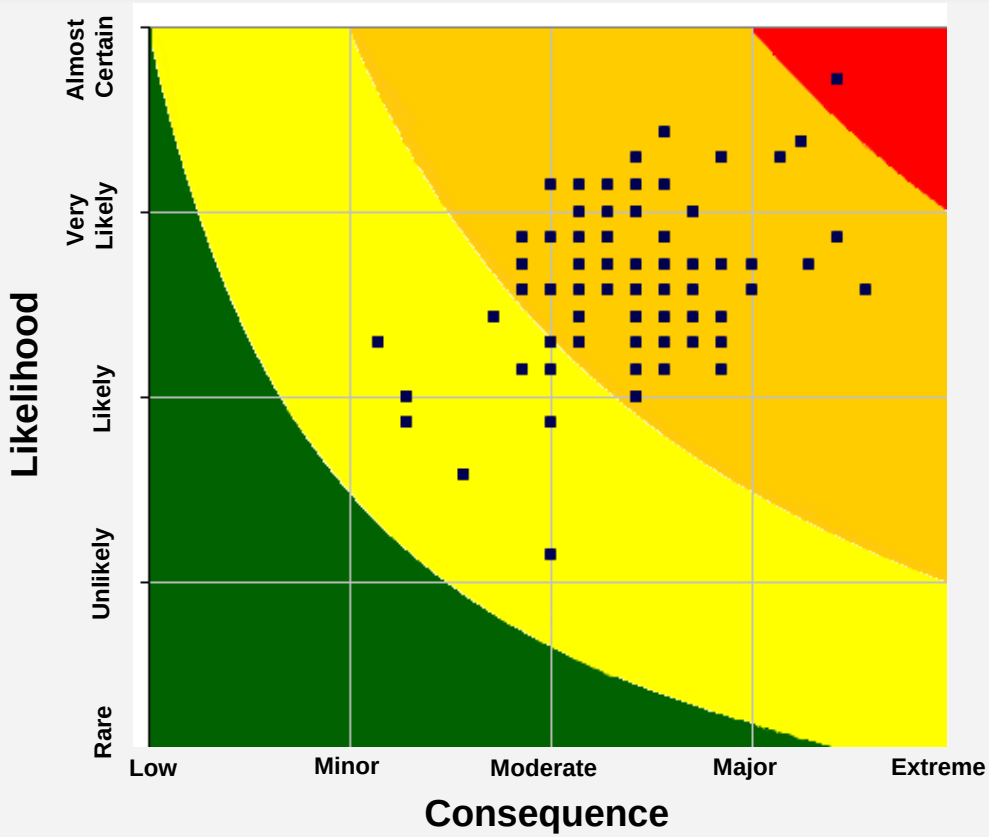
*** Voting Participant** **** Additional Worker Results Validation**

Risk Assessment Workshop: Event Categories

1. Age
2. Chemical Handling
3. Emergency Response
4. Environment
5. Fatigue
6. Fire
7. Guarding
8. IRS
9. Lifting Equipment
10. Lockout
11. Maintenance
12. Mobile Equipment
13. MOL
14. MSD
15. Occupational Disease
16. PPE
17. Psychosocial
18. Regulation
19. Slips, Trips, & Falls
20. Struck By
21. Substance Abuse
22. Supervisor
23. Training
24. Transportation
25. Unauthorized Public Access
26. Utilities
27. Ventilation
28. Working Alone

Logging Sector: Heat Map

Ministry of Labour



RISK RATING
Critical
High
Moderate
Low

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

CONSEQUENCE	DESCRIPTION
Extreme [5]	**Fatality or Permanent Disability** [or extreme impact/importance]
Major [4]	**Serious Event/ Critical Injury or Critical Illness** [or major impact/importance]
Moderate [3]	**Temporary Disability (Lost Time): Injury/Illness** [or moderate impact/importance]
Minor [2]	**First Aid Treatment (No Lost Time)** [or minor impact/importance]
Low [1]	**No injury or Illness** [or negligible impact/importance]

Logging Risk Assessment: Top 10 of 83 Identified Events

Risk Rank	Category	Event (Situation or Condition) that could result in Injury or Illness OR What could keep you up at night?	L		C		Risk
			L	sd-L	C	sd-C	
1	Mobile Equipment	**Distracted driving**	**4.71**	0.49	**4.43**	0.53	**20.88**
2	Substance Abuse	**Under the influence of Drugs and Alcohol in the workplace**	**4.38**	0.74	**4.25**	0.46	**18.59**
3	Struck By	**Danger zones infractions**	**4.29**	0.76	**4.14**	0.69	**17.76**
4	Lockout	**Not properly locked out/improper equipment isolation**	**3.86**	0.38	**4.43**	0.53	**17.08**
5	Training	**Employees taking shortcuts**	**4.29**	0.49	**3.86**	0.38	**16.53**
6	Working Alone	**Working alone in remote location**	**4.29**	0.49	**3.86**	0.38	**16.53**
7	Lockout	**Caught in/compressed by mobile equipment**	**3.57**	0.53	**4.57**	0.79	**16.33**
8	Lockout	**Not locking out mobile equipment to do maintenance around blades**	**3.71**	0.49	**4.29**	0.76	**15.92**
9	Regulation	**Operations directly on public access roads**	**4.43**	0.53	**3.57**	0.53	**15.82**
10	Fatigue	**Fatigue induced incidents**	**4.00**	0.82	**3.71**	0.49	**14.86**

Logging Risk Assessment: Top 10 Risk Categories Based On Highest Risk Within That Category

#	Category	Situation or Condition that could result in Injury or Illness OR What could keep you up at night?
1	**Mobile Equipment**	Distracted driving
2	**Substance Abuse**	Under the influence of Drugs and Alcohol in the workplace
3	**Struck By**	Danger zones infractions
4	**Lockout**	Not properly locked out/improper equipment isolation
5	**Training**	Employees taking shortcuts
6	**Working Alone**	Working alone in remote location
7	**Regulation**	Operations directly on public access roads
8	**Fatigue**	Fatigue induced incidents
9	**Lifting Equipment**	Lifting Logs/Trees
10	**Maintenance**	Mechanics standing on equipment, cylinders, and other equipment to perform maintenance

Worker Vs. Workshop Results: Top 10 Comparison

Worker

Risk Rank	Category	Situation or Condition that could result in Injury or Illness OR What could keep you up at night?	Risk
1	Mobile Equipment	Distracted driving	20.22
2	Fatigue	Fatigue induced incidents	17.33
3	Training	Employees taking shortcuts	17.33
4	Struck By	Danger zones infractions	17.33
5	Mobile Equipment	Load security	17.33
6	Substance Abuse	Under the influence of Drugs and Alcohol in the workplace	17.00
7	Working Alone	Working alone in remote location	16.00
8	Fatigue	Long hours of work during winter (dark) months	16.00
9	Lockout	Lack of Lockout procedures	16.00
10	Training	Chainsaw cutting poles under pressure and chicots	16.00

Workshop Results

Risk Rank	Category	Situation or Condition that could result in Injury or Illness OR What could keep you up at night?	Risk
1	Mobile Equipment	Distracted driving	20.88
2	Substance Abuse	Under the influence of Drugs and Alcohol in the workplace	18.59
3	Struck By	Danger zones infractions	17.76
4	Lockout	Not properly locked out/improper equipment isolation	17.08
5	Training	Employees taking shortcuts	16.53
6	Working Alone	Working alone in remote location	16.53
7	Lockout	Caught in/compressed by mobile equipment	16.33
8	Lockout	Not locking out mobile equipment to do maintenance around blades	15.92
9	Regulation	Operations directly on public access roads	15.82
10	Fatigue	Fatigue induced incidents	14.86

Employer Vs. Workshop Results: Top 10 Comparison

Employer

Risk Rank	Category	Situation or Condition that could result in Injury or Illness OR What could keep you up at night?	Risk
1	Mobile Equipment	Distracted driving	21.38
2	Substance Abuse	Under the influence of Drugs and Alcohol in the workplace	20.19
3	Struck By	Danger zones infractions	18.00
4	Lockout	Not properly locked out/improper equipment isolation	18.00
5	Lockout	Not locking out mobile equipment to do maintenance around blades	17.81
6	Emergency Response	Medical Emergencies in isolated areas	17.00
7	Working Alone	Working alone in remote location	16.88
8	Lockout	Caught in/compressed by mobile equipment	16.88
9	Slips, Trips, and Falls	Falls above 10'	16.00
10	Training	Employees taking shortcuts	15.94

Workshop Results

Risk Rank	Category	Situation or Condition that could result in Injury or Illness OR What could keep you up at night?	Risk
1	Mobile Equipment	Distracted driving	20.88
2	Substance Abuse	Under the influence of Drugs and Alcohol in the workplace	18.59
3	Struck By	Danger zones infractions	17.76
4	Lockout	Not properly locked out/improper equipment isolation	17.08
5	Training	Employees taking shortcuts	16.53
6	Working Alone	Working alone in remote location	16.53
7	Lockout	Caught in/compressed by mobile equipment	16.33
8	Lockout	Not locking out mobile equipment to do maintenance around blades	15.92
9	Regulation	Operations directly on public access roads	15.82
10	Fatigue	Fatigue induced incidents	14.86

Appendix A: Risk Assessment Methods/Standards*

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)

*** Not an exhaustive list**

Appendix B: Contacts

- For additional information or questions, please contact:

- ✓ **Sujoy Dey, Ph.D.**
  Corporate Risk Officer
  Ministry of Labour
  sujoy.dey@ontario.ca

- ✓ **Tom Welton, CRSP**
  Director, Industrial
  Workplace Safety North
  tom.welton@workplacesafetynorth.ca