

Towards a safe day every day: Lessons from the PDAC-AME annual survey

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PROSPECTORS
DEVELOPERS
ASSOCIATION
OF CANADA

Common H&S Myths

- Myth 1: Exploration projects have less accidents than mining projects
 - **FALSE:** The accident rate in exploration is sometimes higher than mining (including underground mining)

- Myth 2: Exploration is inherently dangerous and we need to just accept that
 - **FALSE:** Many thriving companies have accident free records

HOW DOES HEALTH AND SAFETY AFFECT US?

Individual

- Each person will have their own personal concerns on safety risks and regulations
- Legal aspects
- Concern for fellow worker and public
- Professional duty

Company

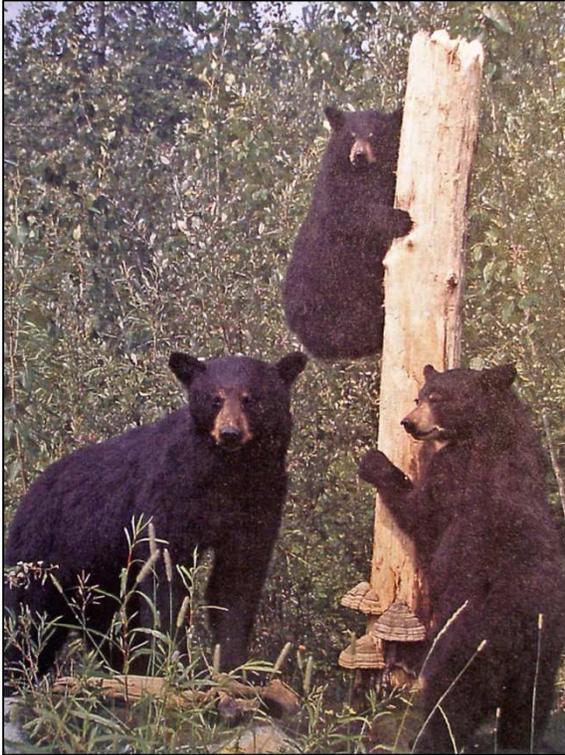
- Company reputation
- Legal aspects
- Economic impact (downtime, damaged equipment, ability to get contracts, fines, etc.)



Safetymatters

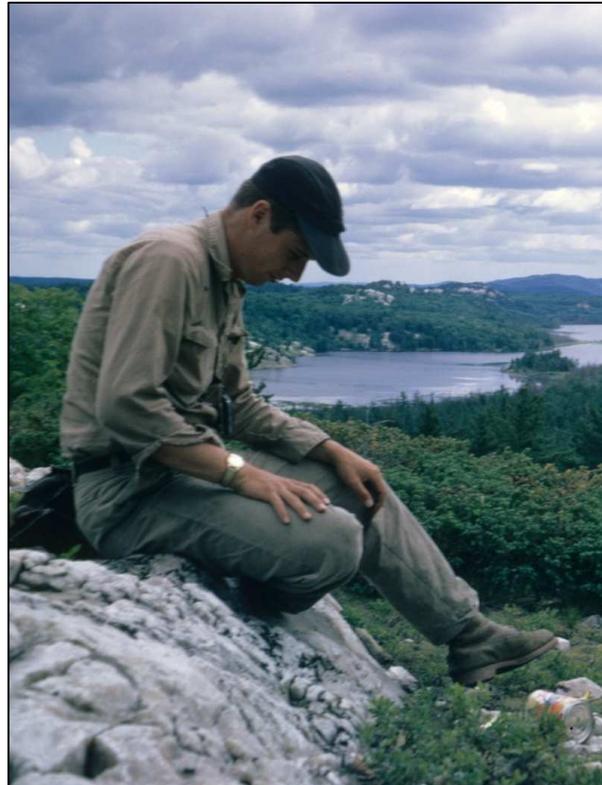
PERSONAL IMPACT THE WORKPLACE

*“31 years, we had a fatality
every ten years”*



ECUADOR HELICOPTER CRASH

Geologists Chris Westerman and Bob Hewton and mining engineer Robert Rivera died in the crash



Chris and Bob were both at university with me and were personal friends

MANAGEMENT LIABILITY

Canadian Federal Bill C-45; The “Westray Bill”

- 217.1 Every one who undertakes, or has the authority, to direct how another person does work or performs a task is under a legal duty to take reasonable steps to prevent bodily harm to that person, or any other person, arising from that work or task
- 220 Every person who by criminal negligence causes death to another person is guilty of an indictable offence and liable
- (a) where a firearm is used in the commission of the offence, to imprisonment for life and to a minimum punishment of imprisonment for a term of four years; and
- (b) in any other case, to imprisonment for life.

To date there have been eight cases where charges have been laid



PROFESSIONAL LIABILITY

Professional Geoscientists Act, 2000 (Ontario)

A member or certificate holder commits professional misconduct when:

1. Failing to make reasonable provision for safeguarding the life, health or property of a person who may be affected by the work for which the member or certificate holder is responsible
2. Failing to correct or to report a situation that the member or certificate holder believes may endanger the safety or the welfare of the public

HEALTH AND SAFETY OVERARCHING PRINCIPLES

Every worker has the right to refuse unsafe work



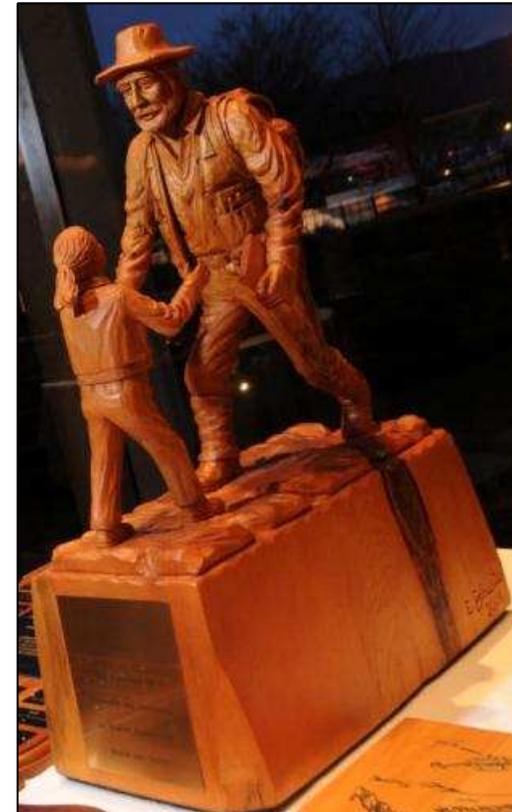
Every worker has the responsibility for his fellow worker with respect to unsafe work



PDAC AND AME HEALTH AND SAFETY OBJECTIVES

- Zero Fatalities
- Reduced Accidents

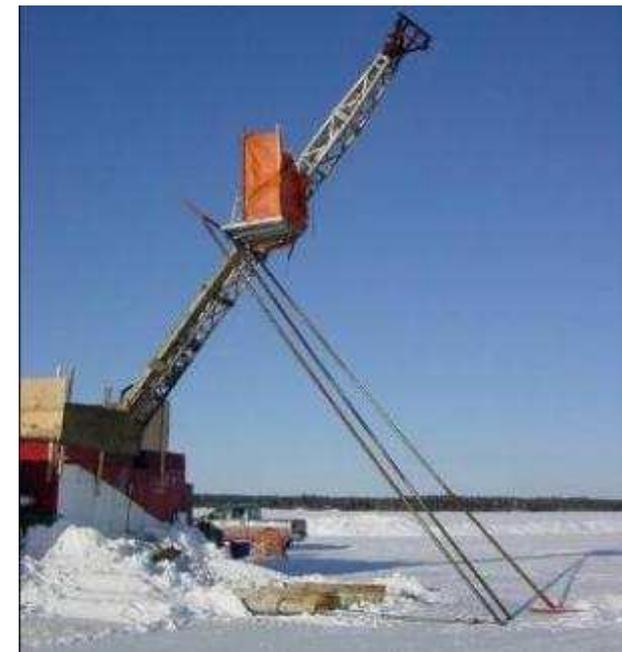
“Towards a safe day every day”



AME's Dave Barr Award

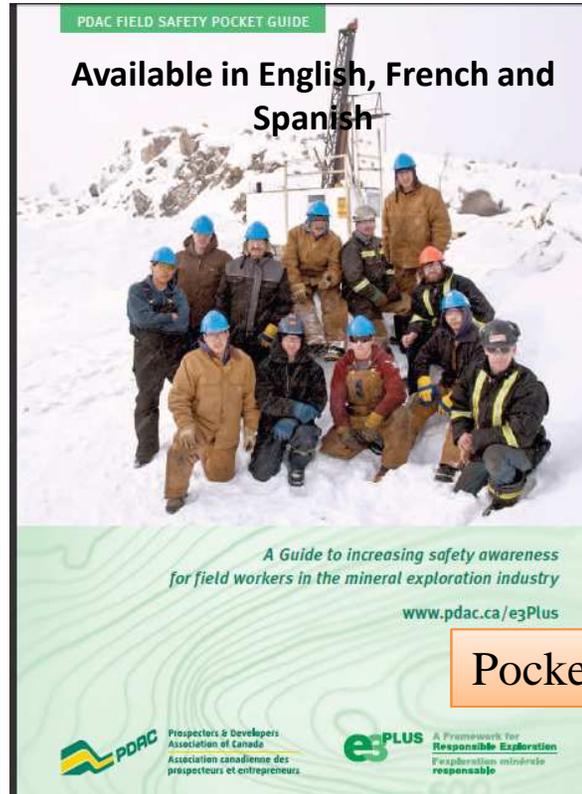
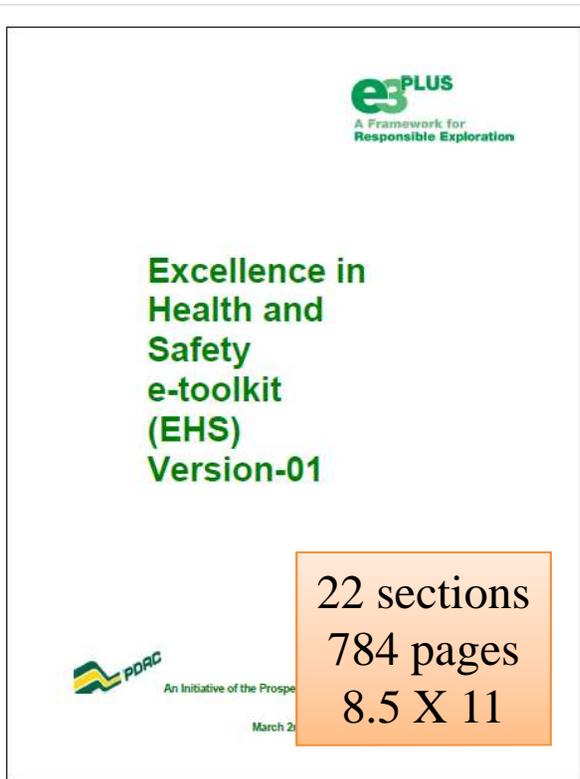
PDAC HEALTH AND SAFETY STRATEGY

1. Produce guidance for junior company executives and managers
2. Improve capacity of field workers
3. Publicize achievements through awards
4. Create awareness of risk of fatality and probable causes
 - a) National annual survey
 - b) Database of exploration related fatalities
 - c) Safety alerts

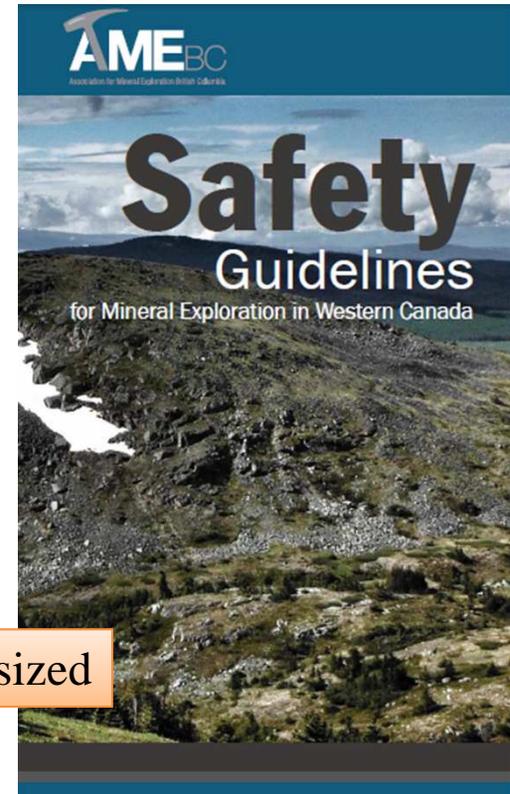


STRATEGY ELEMENT #1: SAFETY MANUALS

PDAC & AME



Pocket sized



STRATEGY ELEMENT #2: TRAINING

PDAC Health And Safety Course

- 5th year at PDAC Convention
- Subsidized, affordable registration cost
- Broad coverage of H&S
 - Statistics
 - Management
 - Risk analysis, Root cause analysis
 - Drilling
 - Helicopters
- AME also runs Health and Safety courses in British Columbia



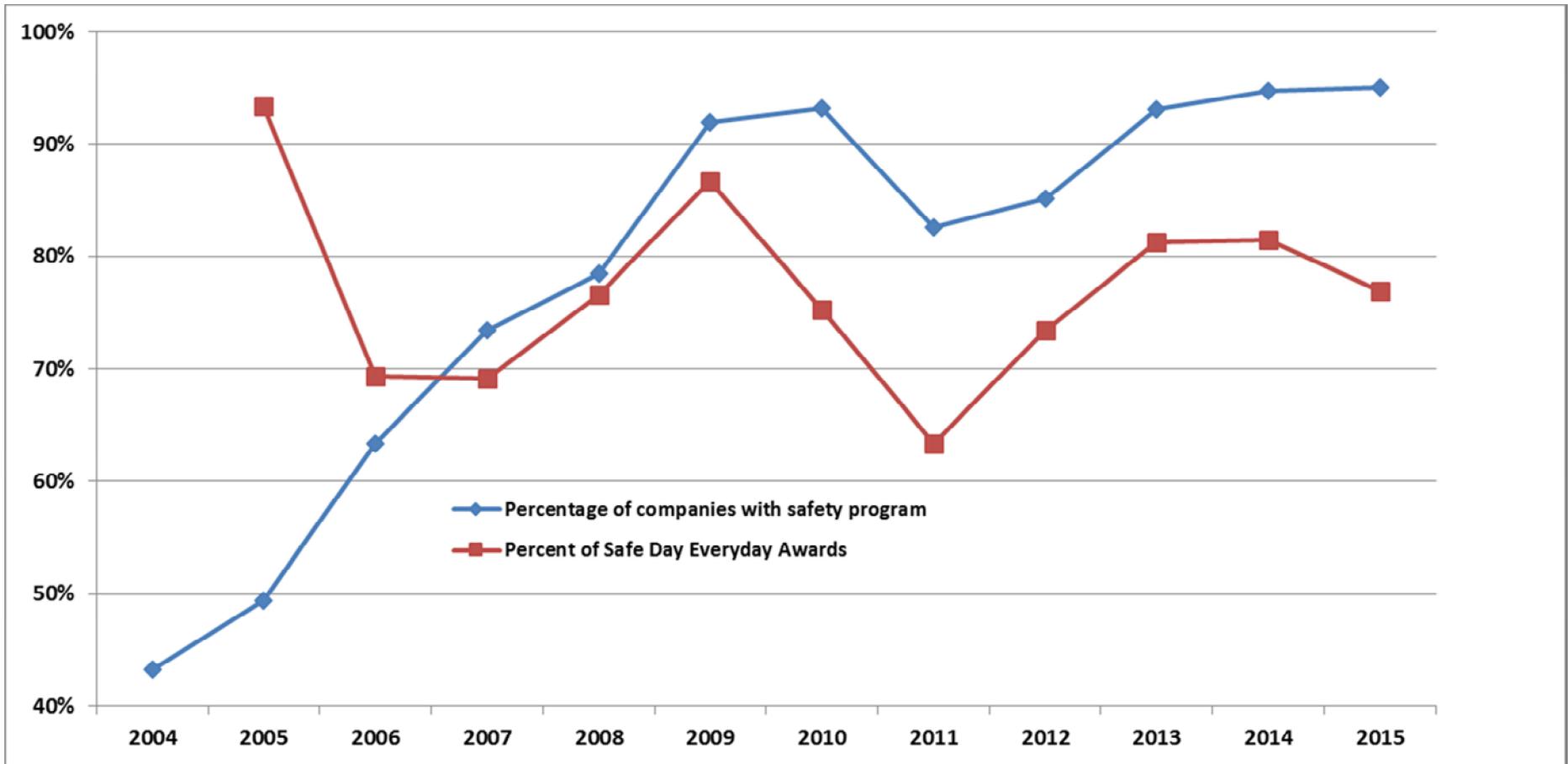
STRATEGY ELEMENT #3: AWARDS & RECOGNITION

- Two Gold Awards
 1. Most Hours Lost Time Incident Accident Free
 2. Most Hours Reportable Injury Free
- Silver Award
 - >10,000 Hours With No Reportable Injury
- Bronze Award
 - No Lost Time Incident In Calendar Year
 - Reportable injuries: medical aid & lost time



BRONZE AWARD

Individual Company Recognition



STRATEGY ELEMENT #4: ANNUAL HEALTH AND SAFETY SURVEY

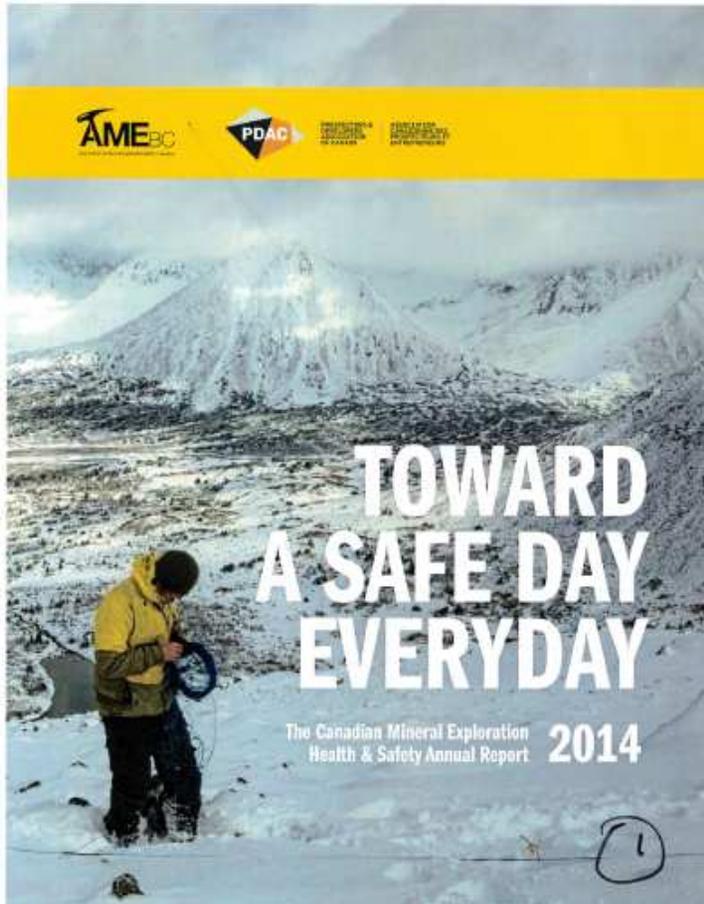
- AME conducted in BC and Yukon and PDAC partnered to take national in Canada in 2005
- About 100 companies now respond each year
- Feedback provides brief description of accidents



<http://www.explorationsurvey.ca>

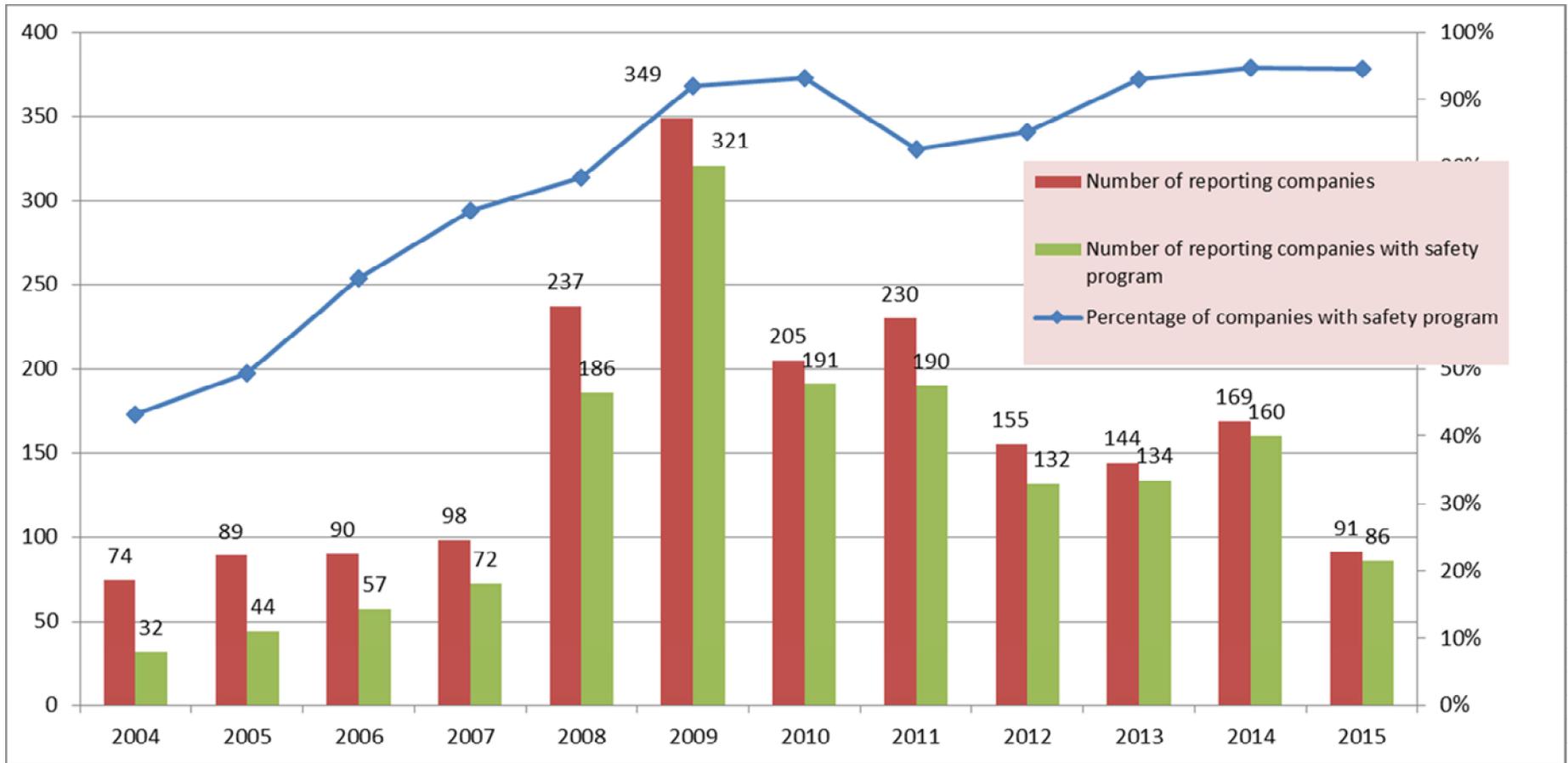
THE ANNUAL SURVEY REPORT

<http://www.pdac.ca/pdac/advocacy/health-safety/>



- Results of the survey
- Number of accidents and frequencies
- Types of accidents
- Report on fatal accidents
- Listing of companies that responded and those with no LTIs
- All reports from 2005 to 2014 available

CORPORATE SAFETY PROGRAMS



LAGGING INDICATORS



CAUSES OF LOST TIME INCIDENTS

LITTLE CHANGE OVER TIME

Note various includes

- “Other”
- Other object
- Weather
- Camp

	LTI Only			All incidents							Average
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Slips and Falls	41%	23%	24%	24%	18%	18%	13%	15%	12%	13%	16%
Drilling machinery	41%	21%	18%	13%	16%	8%	10%	13%	12%	15%	13%
ATV/Snowm/Vehicle	4%	18%	13%	12%	9%	10%	9%	16%	21%	15%	13%
Lifting	0%	11%	11%	9%	8%	13%	5%	3%	3%	4%	6%
Tools/equipment	0%	9%	16%	12%	8%	11%	11%	15%	12%	12%	11%
Medical	7%	7%	4%	2%	2%	1%	2%	1%	2%	1%	2%
Field Work	0%	0%	0%	2%	7%	6%	22%	2%	8%	8%	9%
Various	7%	12%	13%	25%	33%	33%	28%	34%	29%	31%	30%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
TOTAL NUMBER	27	57	45	165	719	374	809	536	545	504	3,781

THIS NEEDS REVISING & UPDATING: WHO HAS THE ACCIDENTS? GENERALLY YOUNGER OR JUNIOR PEOPLE

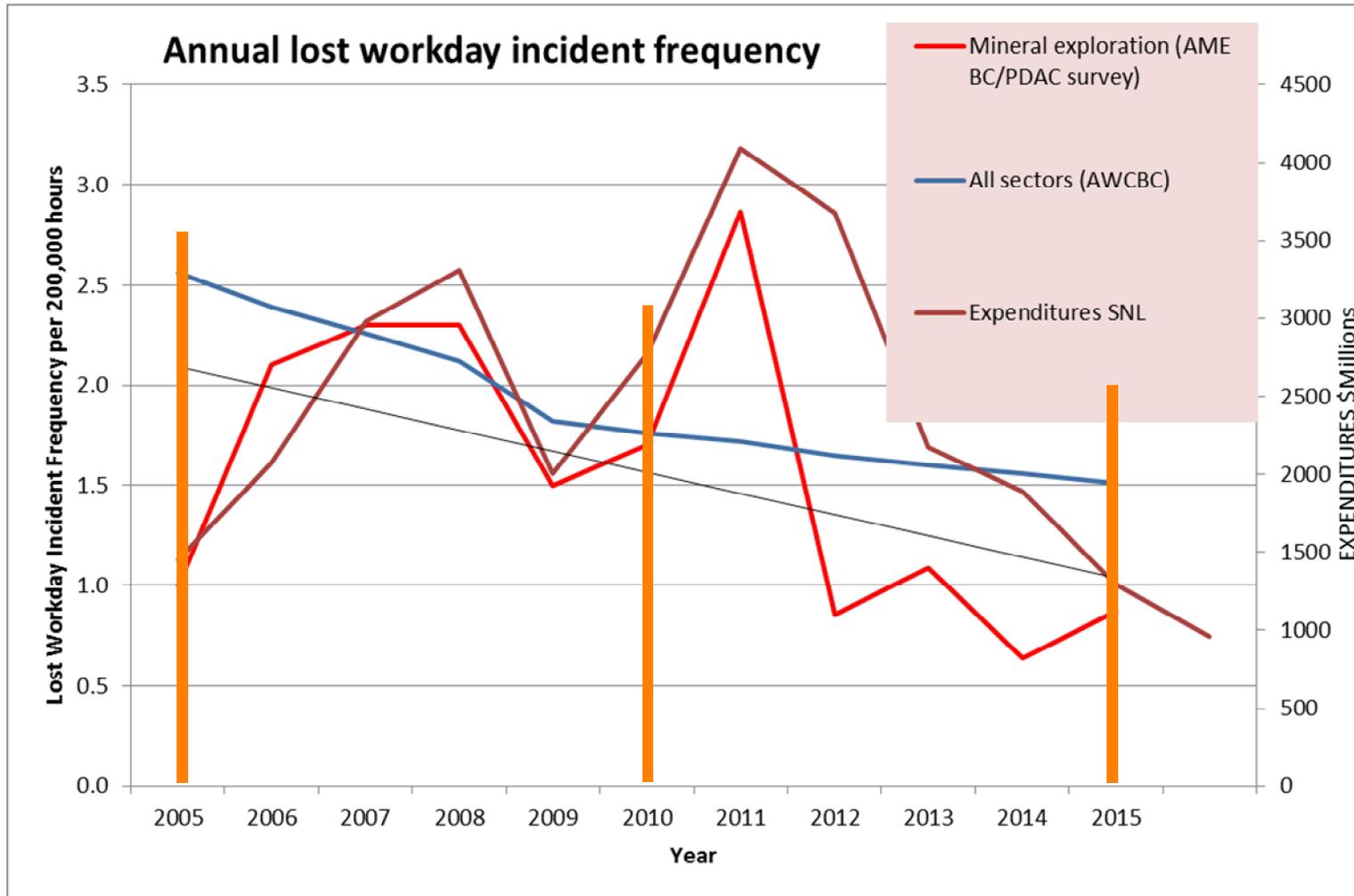
Data for 2005-2010				
	All incidents	Medical aids	Change	
Driller Helper	24%	32%	35%	Increase
Driller	14%	16%	14%	
Field Assistant	11%	12%	4%	Small Change/ Decrease
Geologist	12%	9%	-25%	
Geophysicist	3%	4%	14%	Increase
Line Cutter	3%	4%	40%	
All others	44%	25%	-43%	Decrease
Number reported	347	248		

Key points:

- Drill helpers, drillers and Field Assistants have more frequent and more serious accidents
- Experienced workers have less frequent and less serious accidents in each category

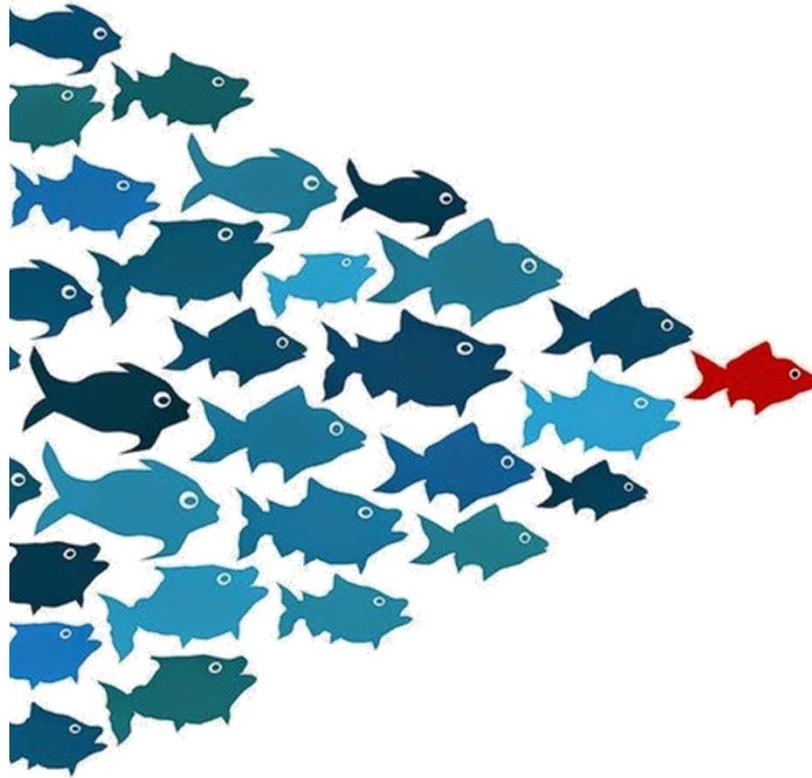


INCIDENT FREQUENCIES



One year = 220 working days * 8 hrs = 1760 hrs

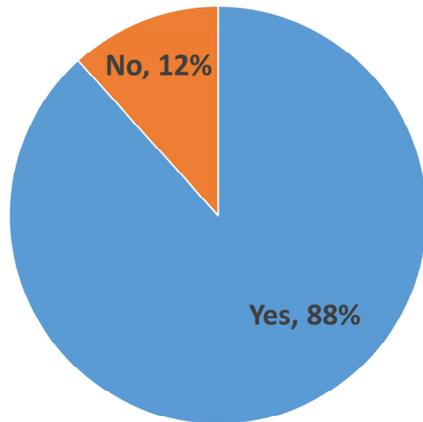
LEADING INDICATORS



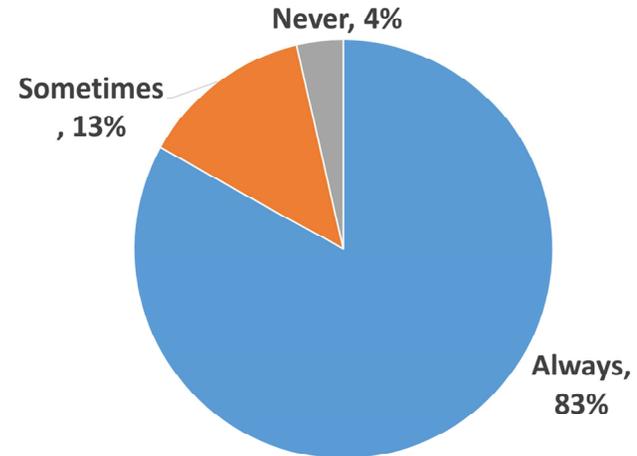
2013-2015 LEADING INDICATORS

STILL HAVE SOME DISTANCE TO GO TO 100% SAFETY CULTURE

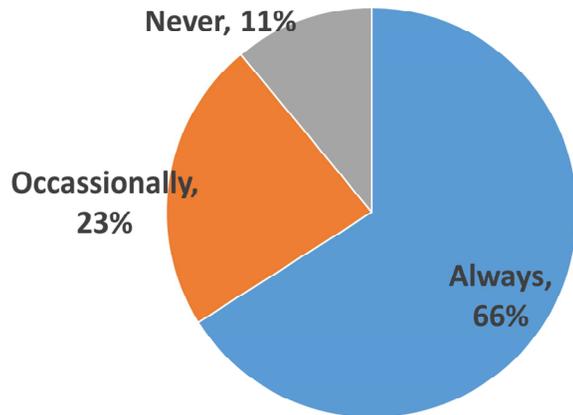
HEALTH AND SAFETY PROGRAM



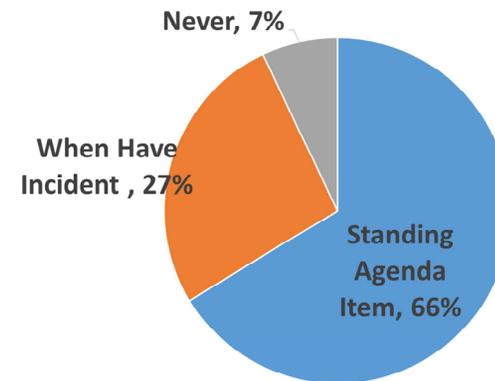
EMERGENCY RESPONSE PLAN



Safety Topic at Project Meetings



Health and Safety at the Board of Directors



STRATEGY ELEMENT #5: THE FATALITY DATABASE

- Documents root causes of incidents
- Basic principle to understand
 - Predominant root causes of non-fatal and fatal accidents **may** be different
 - Tackling Near Miss and Lost Time Incident (LTI) causes will not **necessarily** reduce fatal accidents and vice versa
- Personal research into mineral exploration incidents reinforces this concept



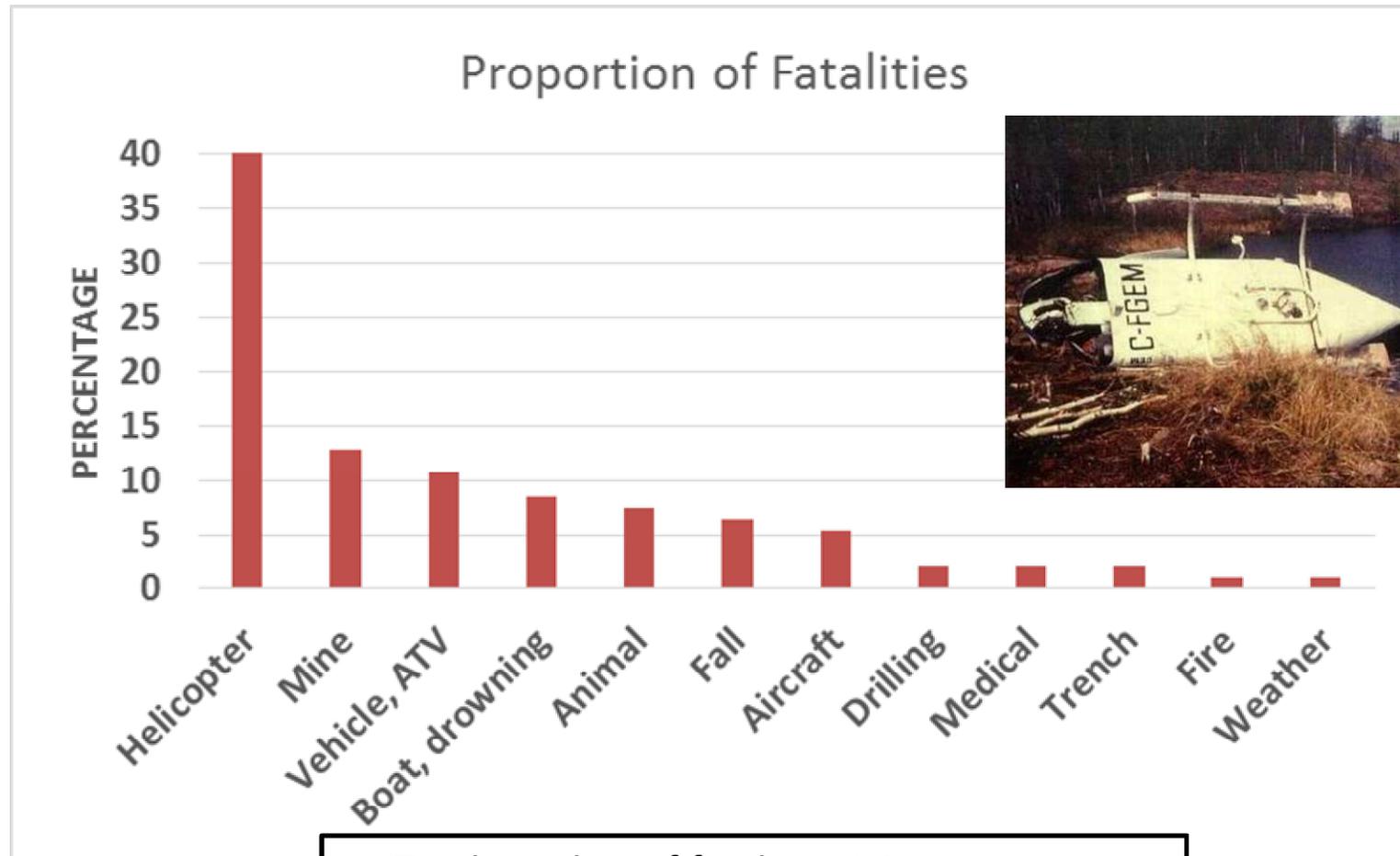
THE FATALITY DATABASE

- 35 year database of fatal accidents
- Relies on memories
- 2000-2015 - more detailed
 - Focused on Canada



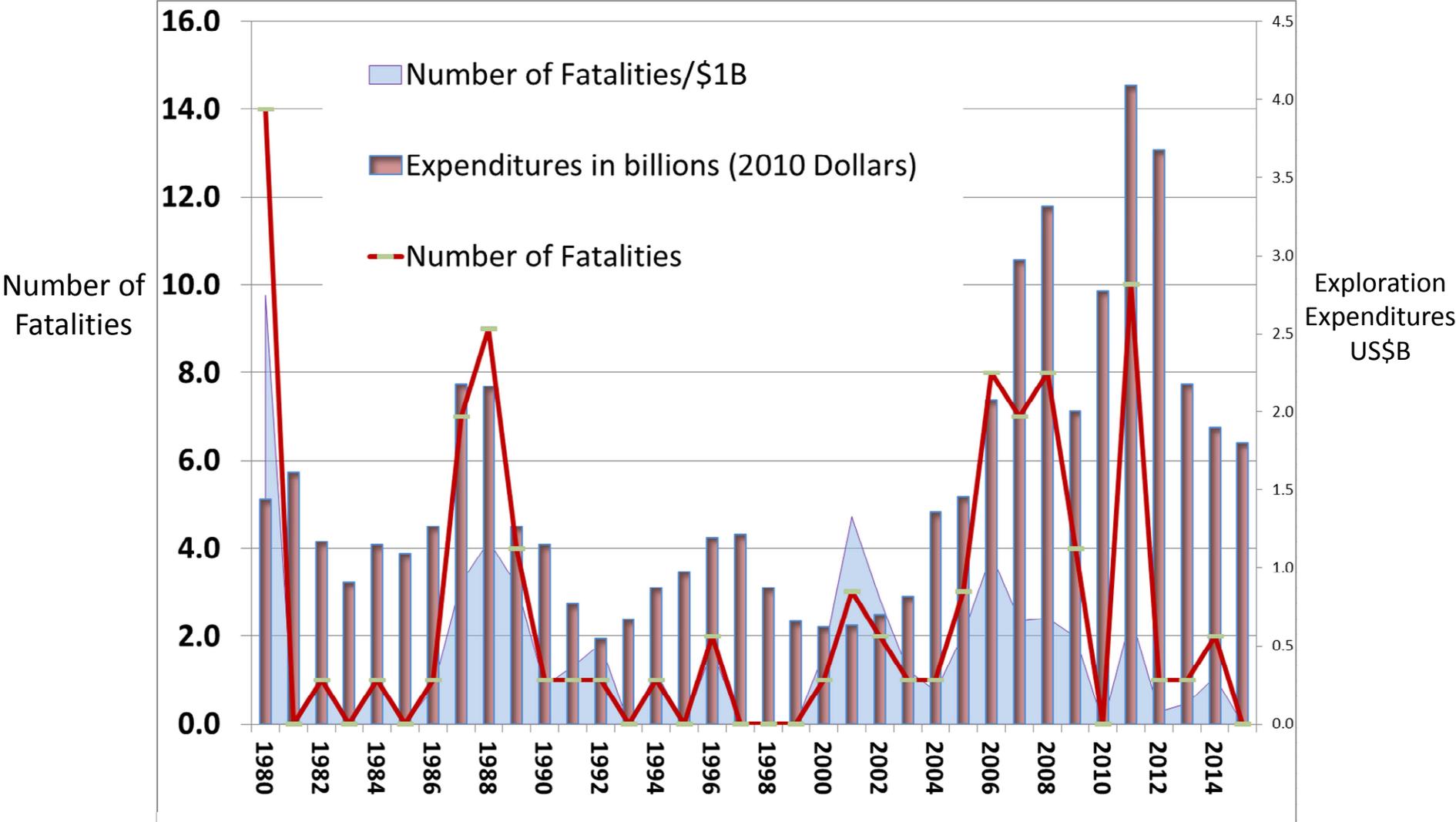
Bulldozer hole through the ice

FATAL ACCIDENT CAUSES 1980-2015 (CANADA)



- Total number of fatalities 94
- Database from 35 years of incomplete data

FATALITIES AND EXPLORATION EXPENDITURES



“THE EXPLORATION WATCHLIST”

- Helicopters
- Weather
- Vehicles/ATVs
- Boats
- Aircraft
- Travel on ice



~75% of fatal accidents

THE LESSONS



THE GOOD

- 95% of companies have H&S plans (up from 40% in 2005)
- Majority of companies discuss H&S every day in the field and at board of directors meetings
- In the past 3 years, accident rates have fallen about half the Canadian average for all occupations
- Fatalities have been low (1-2 per year) 2012-2014 and zero 2015-2016 (NONE IS THE OBJECTIVE)

THE BAD

- 1 in 6 companies sometimes don't have an emergency response plan at all sites
- 1 in 4 companies only conduct risk analysis and H&S meetings occasionally
- 1 in 4 boards only discuss H&S if there is an accident
- 1 in 10 boards never discuss H&S
- The LTI and fatality frequency may be down (2012-15) because companies don't have enough money to do lots of field work



THREE KEY MESSAGES

1. More junior exploration company workers appear to have more accidents
2. Accident rates generally appear to be higher in “boom” times
3. Too many boards of directors (and perhaps some professionals) do not understand their responsibility towards a corporate safety culture

WHAT WE NEED TO DO

GET THE MESSAGE OUT TO THE HIGHEST LEVEL IN COMPANIES

- Board of Directors need to have health and safety on their board agenda
- Professional engineers and geoscientists need to ensure that health and safety is not omitted in project meetings

THANK YOU!

Bill Mercer
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Member, AME Health and Safety Committee

VP-Exploration, Avalon Advanced Materials Inc

