



URCA Training – August 10, 2017
Darren Spencer, CSP

OSHA Required Programs



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UOSHA Reporting Requirements

- OSHA Act and General Duty Clause
- Hazard Assessments
- PPE
- Hearing Conservation
- Respiratory Protection
- Blood Borne Pathogens – (not covered today).
- Hazard Communication & GHS
- Confined Space Entry
- Lockout/Tagout
- Forklifts
- Fall Protection (barely covered today).

OSHA

Occupational Safety and Health Act of 1970

Congress created the:

Occupational Safety and Health Administration

The idea behind OSHA:

To assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.



OSHA

- OSHA is part of the US Department of Labor
- The Assistant Secretary of Labor for Occupational Safety and Health is the administrator for OSHA
- OSHA's administrator answers to the Secretary of Labor, who is a member of the cabinet of the President of the United States.



Utah OSHA

- Generally follows the Federal OSHA regulations
- www.uosh.utah.gov
- Enforcement (801) 530-6901
- Consultation (801) 530-6855
 - Provides at the employers request a non-penalty approach to safety and health concerns in the workplace, at no charge

UOSHA Reporting Requirements

- Each employer shall within 8 hours of occurrence notify UOSHA of any work related fatalities, of any disabling, serious, or significant injury and of any occupational disease incident
- (Utah Administrative Code R614-1-5C)
- UOSHA Enforcement (801) 530-6901

OSHA's General Duty Clause

- SEC. 5. Duties

(a) Each employer –

(1) shall furnish to each of his employees

employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;



OSHA Recordkeeping Requirements

- Employers with 10 or more employees at any time throughout the year are required to keep the OSHA 300 log
 - Some low hazard industry exceptions
- All cases requiring medical treatment require recording on the log (7 days)
- The OSHA summary log (300A) is required to be posted in the workplace from Feb 1 through April 30 for prior year

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name _____

City _____ State _____

Identify the person			Describe the case		Classify the case	Enter the number of days the injured or ill worker was:	Check the "injury" column or choose one type of illness:																																			
(A) Case no.	(B) Employee's name	(C) Job title (e.g., Welder)	(D) Date of injury or onset of illness	(E) Where the event occurred (e.g., Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)	CHECK ONLY ONE box for each case based on the most serious outcome for that case: <table border="1"> <tr> <th colspan="4">Remained at Work</th> </tr> <tr> <th>Death</th> <th>Days away from work or restriction</th> <th>Job transfer or restriction</th> <th>Other recordable cases</th> </tr> <tr> <th>(G)</th> <th>(H)</th> <th>(I)</th> <th>(J)</th> </tr> </table>	Remained at Work				Death	Days away from work or restriction	Job transfer or restriction	Other recordable cases	(G)	(H)	(I)	(J)	<table border="1"> <tr> <th>Away from work</th> <th>On job transfer or restriction</th> </tr> <tr> <th>(K)</th> <th>(L)</th> </tr> </table>	Away from work	On job transfer or restriction	(K)	(L)	<table border="1"> <tr> <th colspan="6">Check the "injury" column or choose one type of illness:</th> </tr> <tr> <th>(M) Injury</th> <th>Days away from work</th> <th>Job transfer or restriction</th> <th>Medical treatment beyond first aid</th> <th>Loss of consciousness</th> <th>Other</th> </tr> <tr> <th>(1)</th> <th>(2)</th> <th>(3)</th> <th>(4)</th> <th>(5)</th> <th>(6)</th> </tr> </table>	Check the "injury" column or choose one type of illness:						(M) Injury	Days away from work	Job transfer or restriction	Medical treatment beyond first aid	Loss of consciousness	Other	(1)	(2)	(3)	(4)	(5)	(6)
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OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20____
U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
(K)	(L)

Injury and Illness Types

Total number of . . .
(M)

(1) Injuries	_____	(4) Poisonings	_____
(2) Skin disorders	_____	(5) Hearing loss	_____
(3) Respiratory conditions	_____	(6) All other illnesses	_____

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instructions, search existing data sources, gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about this burden estimate or any other aspect of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (e.g., *Manufacture of motor truck trailers*) _____

Standard Industrial Classification (SIC), if known (e.g., 3713) _____

OR

North American Industrial Classification (NAICS), if known (e.g., 336212) _____

Employment information (If you don't have these figures, see the Worksheet on the back of this page to estimate.)

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company executive _____ Title _____

() _____ Date _____
Phone _____

Hazard Assessment



- Determining your employees' personal protection equipment needs starts with a hazard assessment.
- The hazard assessment should begin with a walk-through survey of the facility or jobsite to develop a list of potential hazards.

Hazard Assessment

- Categories:
 - Impact,
 - Penetration,
 - Compression (roll-over),
 - Chemical,
 - Heat/cold,
 - Harmful dust,
 - Light (optical) radiation, and
 - Biologic.



Hazard Assessment

Written certification of a completed hazard assessment is required to include the following information:

- Identification of the workplace evaluated;
- Name of the person conducting the assessment;
- Date of the assessment; and
- Identification of the document certifying completion of the hazard assessment.



Personal Protective Equipment (PPE)

- Specialized clothing or equipment worn by employees for protection against health and safety hazards.
- Personal protective equipment is designed to protect many parts of the body, i.e., eyes, head, face, hands, feet, and ears.



Hierarchy of Controls

- The Hierarchy of Controls determines the preferred method of controlling hazards
 1. Engineering Controls
 - Safeguarding Equipment
 2. Administrative Controls
 - Safe Work Practices and Procedures
 3. Personal Protective Equipment (PPE)
 - The least desirable method
- PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices

OSHA Noise Standard

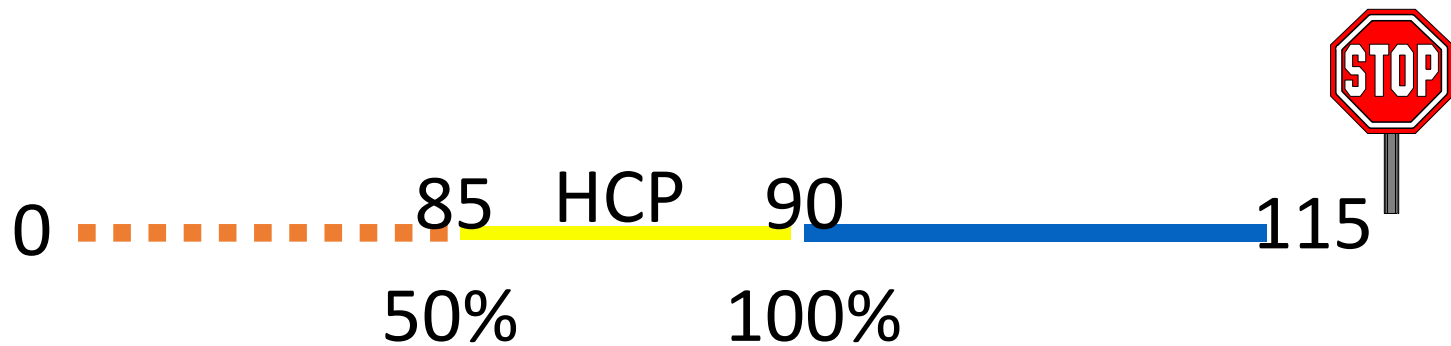
Duration (hours)	Decibel Level
16	85
12	87
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Hearing Conservation Program:

Occupational Noise Exposure

29 CFR 1910.95

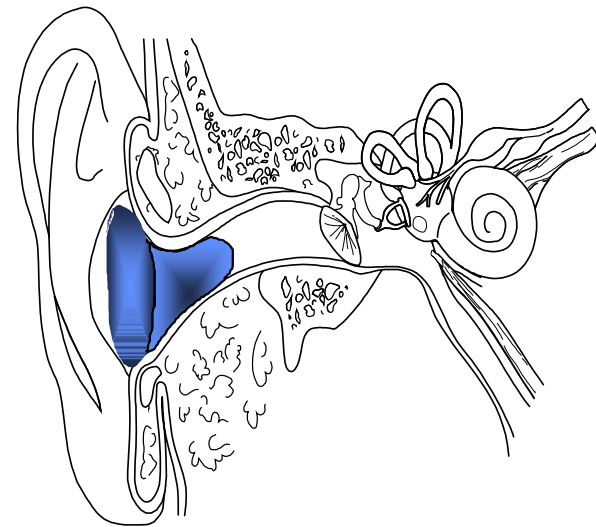
- If employee noise exposure is > 85 dBA over an eight hour period, or > 50% dose



Hearing Conservation Program

29 CFR 1910.95

- Exposure Monitoring
- Audiometric Testing
- Hearing Protection
- Employee Training
- Recordkeeping



Exposure Levels

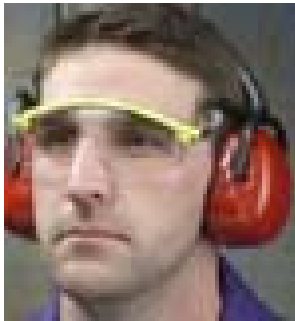
- 8 hour exposure of 90 dBA
- Different levels of exposure within the 8 hour shift
 - $C1/T1 + C2/T2 + \dots =$
 - If that exceeds 1 then the employee is over
- Impulse or impact noise should not exceed 140 dB (peak)

Recordkeeping

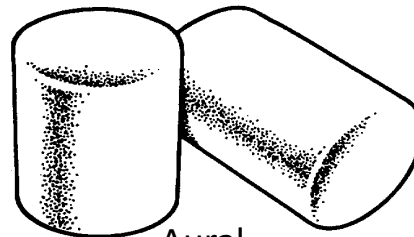
- Noise exposure measurement = *2 years*
- Audiometric tests = *duration of affected employee's employment*
- Audiometric Exam requirements:
 - Name & job classification
 - Date, Examiner's name
 - Calibration date of equipment
 - Employee's noise exposure assessment
 - Sound pressure levels of audiometric test room

Types of Hearing Protection

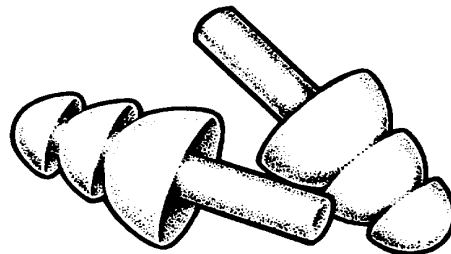
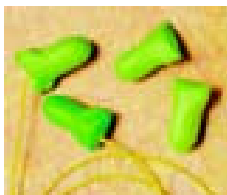
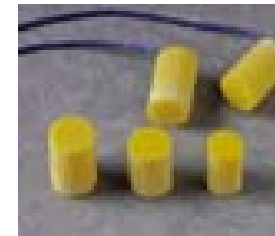
Required when noise exposure is above OSHA Action limit of 85dBA TWA



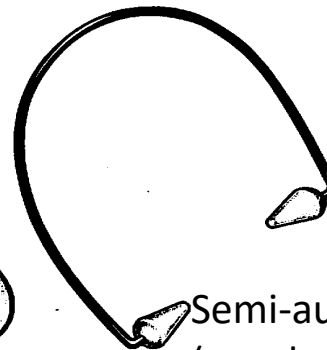
Circum-aural
(ear muffs)



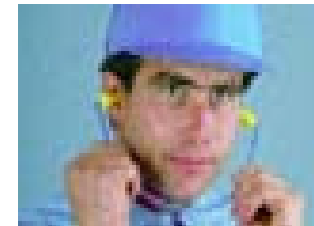
Aural
(plugs)



Aural (plugs)



Semi-aural
(canal caps)



Respiratory Protection

29 CFR 1910.134

- Purpose: To ensure employees have the appropriate respirators and they understand proper respirator use.
- Application: Any employee wearing a respirator in the workplace.



Respiratory Protection (1910.134)

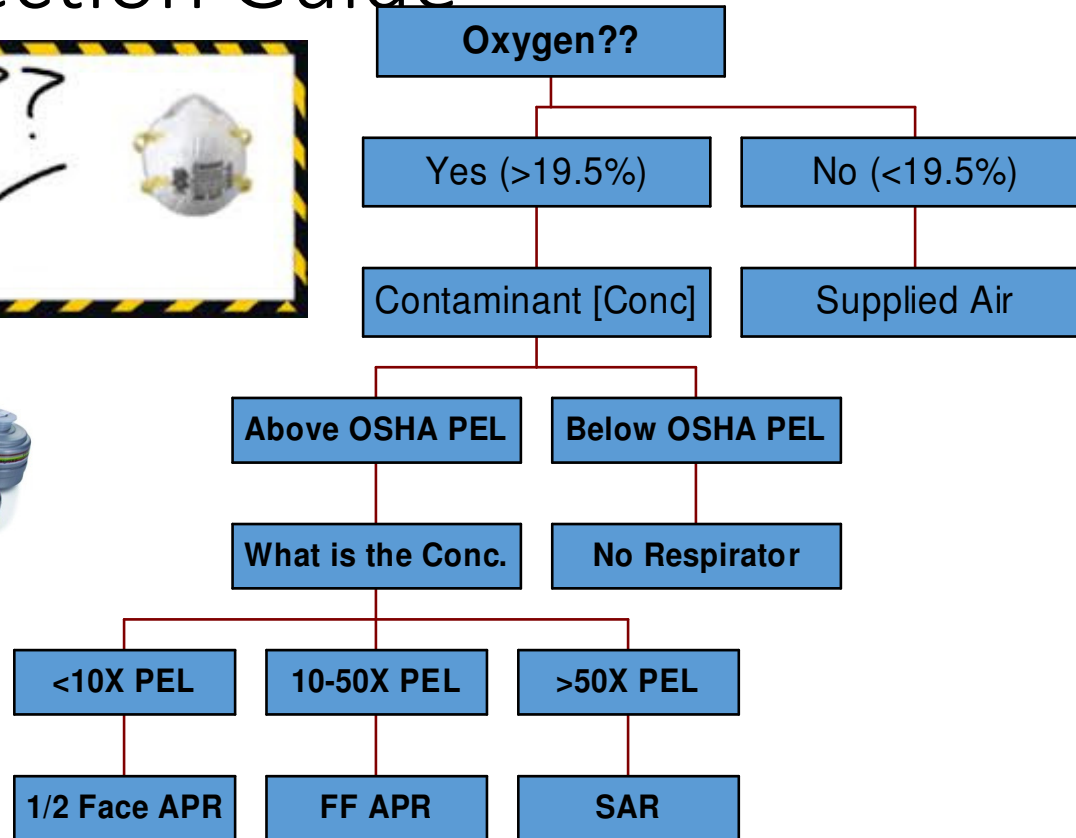
- In the control of occupational diseases caused by breathing contaminated air..., the primary objective shall be to prevent atmospheric contamination by accepted engineering controls
- When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used
- Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee

Respirator Program Requirements

- Written standard operating procedures governing the selection and use of respirators
- Respirator selection criteria based on exposure type and concentration



Respirator Selection Guide



Respirator Program Requirements

- Workplace surveillance (IH monitoring etc.)
- Program review
- Employee medical evaluation prior to use
- Respirator “Fit Testing”
- Use only NIOSH/MSHA approved respirators
- Training requirements (use & limitations)
- Respiratory care and maintenance
 - cleaning & storage
- Respirator inspection
- Program Evaluation



Hazard Communication

- 29 CFR 1910.1200
- Right to Know
- Workers have the right to *know* and *understand* the hazardous chemicals they use and how to work with them safely.



Hazard Communication Employer Requirements

- Written Hazard Communication Program
- Safety Data Sheets (SDS) for all “hazardous substances”
- Employee Training
- Container Labeling



The GHS Labeling System

The standardized label elements in the GHS include:

- **Symbols** (hazard pictograms)
- **Signal Words:** "Danger" or "Warning" are used to emphasize hazards and indicate the relative level of severity of the hazard
- **Hazard Statements:** Phrases assigned to a hazard class & category that describe the nature of the hazard.

2**1 Sulfuric Acid**

3 Danger! May be harmful if swallowed.
4 Causes severe skin burns and eye damage. Fatal if inhaled. Harmful to aquatic life.

2**5**

Do not breathe dust/fume/gas/mist/vapors/spray. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

In case of fire Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

See Material Safety Data Sheet for further details regarding safe use of this product.

6

Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA Telephone : +18003255832

1

Product Identifier

4

Hazard Statements

2

Pictograms

5

Precautionary Statements

3

Signal word, "Danger!"

6

Supplier Information

GHS Pictograms



Safety Data Sheets

Safety Data Sheets: Will now have a specified 16-section format.

- The revised HCS requires that the information on the safety data sheet is presented using consistent headings in a specified sequence.

Safety Data Sheets

The Format of the 16-Section SDS should include the following sections:

Section	Section
1) Identification	9) Physical and Chemical Properties
2) Hazard(s) Identification	10) Stability and Reactivity
3) Composition/Information on Ingredients	11) Toxicological Information
4) First-Aid Measures	12) Ecological Information
5) Fire-Fighting Measures	13) Disposal Considerations
6) Accidental Release Measures	14) Transport Information
7) Handling and Storage	15) Regulatory Information
8) Exposure Controls/PPE	16) Other Information

Permit-Required Confined Space Entry

- 29 CFR 1910.146
- Confined Space Defined
 - A space that
 - Is large enough that an employee can bodily enter; **and**
 - Has limited or restricted means for entry or exit; **and**
 - Is not designed for continuous employee occupancy

Permit-Required Confined Space Defined:

A confined space that has one or more of the following characteristics:

- (1) Potentially hazardous atmosphere;
- (2) Potential for engulfing an entrant;
- (3) Internal configuration with potential to trap or asphyxiate an entrant (i.e. inwardly converging walls, sloping or tapering floor; or
- (4) Contains any other recognized serious safety or health hazard.

Confined Space Defined

- 1) You can get in it.
- 2) It wasn't that easy to get in it.
- 3) You don't want to stay in it.



Written Confined Space Program

- Identification of Confined Spaces
- Control measures (LO/TO, ventilation)
- Establish written permit system
- Discuss air monitoring
- Selection & training of personnel
- Protective equipment
- Provisions for attendants
- Rescue & emergency response

The Control of Hazardous Energy Lockout/Tagout (29 CFR 1910.147)

- **Purpose:** Protect employees from accidental release of energy during the maintenance or servicing of equipment, machines or processes.



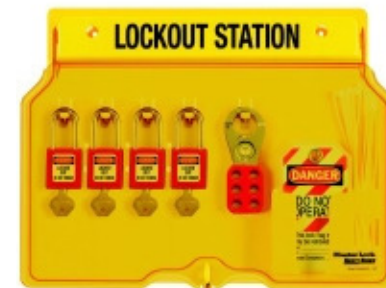
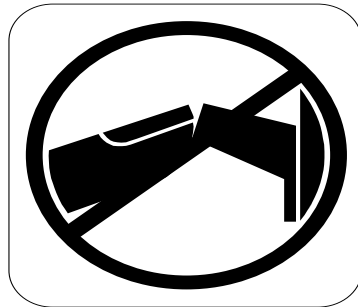
LockOut TagOut (LO/TO)

- **Application:** Any company that has equipment, machines, vehicles or processes where accidental energy release is possible.
 - unexpected startup of equipment
 - release of stored energy



LockOut TagOut (LO/TO)

- Hazardous Energy must be controlled by means of a lock and tag to avoid unexpected startup (Simplified!!!)



Forklifts (1910.178)

General Requirements

- Forklifts required to have label (nameplate) with the forklift capacity and type (D, DS, DY, E, ES, EE, EX, G, GS, LP, LPS)
- Forklifts allowed in designated locations for which they are approved
 - Gasoline forklifts shouldn't be used in enclosed areas
- Overhead guards and seat belts
- Designated battery charging areas required for electric forklifts
- Must be operated properly and in accordance with owners manual

Forklifts Requirements

- Operator Training
 - Formal Training on the forklifts used and the workplace where used
 - Evaluation
- Trainer must be competent
- Refresher Training every 3 years or...
 - Operator is unsafe, involved in an accident, assigned a different type of truck, or a condition in the workplace changes that could affect safe operation

Fall Protection

- Anchorages shall be capable of supporting at least 5,000 lbs. per employee attached
- At what height do you need fall protection?
 - Construction 6 feet
 - General Industry 4 feet
- Fall protection may consist of safety railing, covers, safety nets, full body harnesses with shock absorbing lanyards

Open-Sided Floors and Platforms

- Open-sided floors or platforms 4 feet or more above adjacent floor or ground level must be guarded by a standard railing (or equivalent) on all open sides, except where there is an entrance to a ramp, stairway, or fixed ladder



OSHA Required Programs

- Questions?



- Thank You!

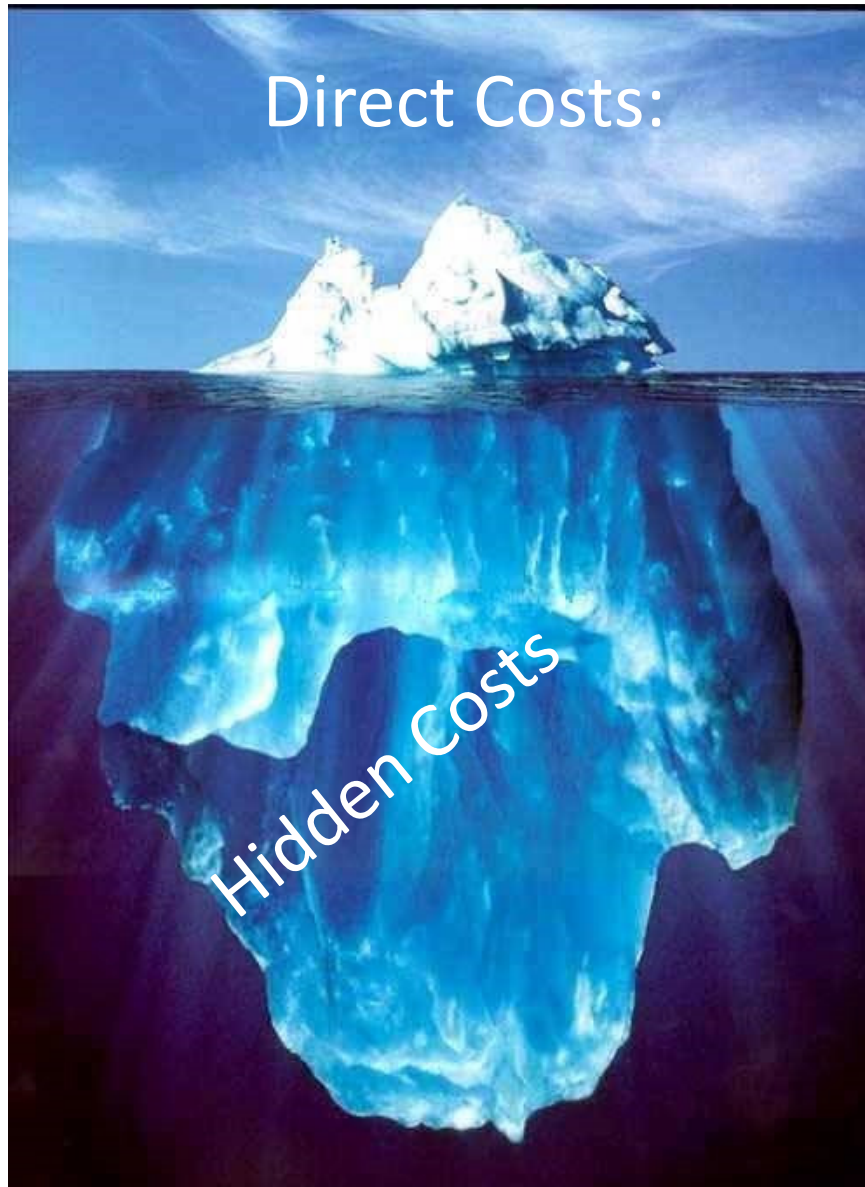


Controlling Workers Comp Costs

Costs of Accidents

- Direct Costs
 - Costs that can be easily quantified
- Indirect Costs - AKA Hidden Costs
 - Costs that are not easily quantified

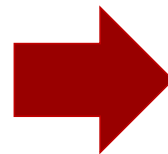




- Medical
- Workers Compensation
- Time lost from work
- Loss in earning power
- Lost time by fellow workers
- Lost time by supervision
- Cost of breaking in new person
- Damage to tools and equipment
- Equipment is out of service
- Spoiled work
- Spoilage - fire, water, chemical,
- Failure to fill orders
- Overhead cost
- Loss of Morale
- Legal Costs

How much does an injury really cost?

Studies published in safety and health texts and professional journals have estimated that the indirect or **hidden costs** of a specific injury-producing accident will range **between 5 and 50 times the direct costs** associated with that accident.



Cost of Injuries Based on Medical Costs

Given the average *medical* cost of a “dust in the eye” injury is \$200:

$$5 \times 200 = \$1000 \quad 50 \times 200 = \$10,000$$

Given that the average *medical* cost of carpal tunnel surgery is \$20,000

$$5 \times 20,000 = \$100,000 \quad 50 \times 20,000 = \$1 \text{ Million}$$

Injury Costs (dollars)	Company Profit Margin				
	2%	4%	6%	8%	10%
\$ 10,000	500,000	250,000	167,000	125,000	100,000
\$ 20,000	1,000,000	500,000	333,000	250,000	200,000
\$ 50,000	2,500,000	1,250,000	833,000	625,000	500,000
\$ 75,000	3,750,000	1,875,000	1,250,000	938,000	750,000
\$ 100,000	5,000,000	2,500,000	1,667,000	1,250,000	1,000,000
\$ 500,000	25,000,000	12,500,000	8,333,000	6,250,000	5,000,000

Sales necessary to offset the cost of accidents and injuries at different profit margins.

Donald Bloswick, Ph.D., P.E., C.P.E.

University of Utah

Cost of Injuries Based on Cost of Insurance

- You can calculate the amount of sales needed to pay for premiums:

$$\frac{\text{Cost of WC Insurance}}{\% \text{ Profit Margin}} = \$ \text{ Needed in Sales}$$

% Profit Margin

EXAMPLE:

- \$400,000 premium cost
- 10% profit margin

$$\frac{\$400,000 \text{ in premiums}}{0.10} = \$4 \text{ Million in Sales}$$

2 Simple Steps to Cutting Workers Comp Costs:

- Prevent Injuries
- Manage the Injuries that Occur

2 Simple Steps to Cutting Workers Comp Costs:

- Prevent Injuries
- Manage the Injuries that Occur

How does preventing accidents
save on Workers Comp costs?



E-mod

- Calculated by NCCI
- Rating premium must be \$7,000 in one year or \$3,500 two consecutive years
- Statistical rating used to modify individual business rates as compared with industry average

E-mod cont.

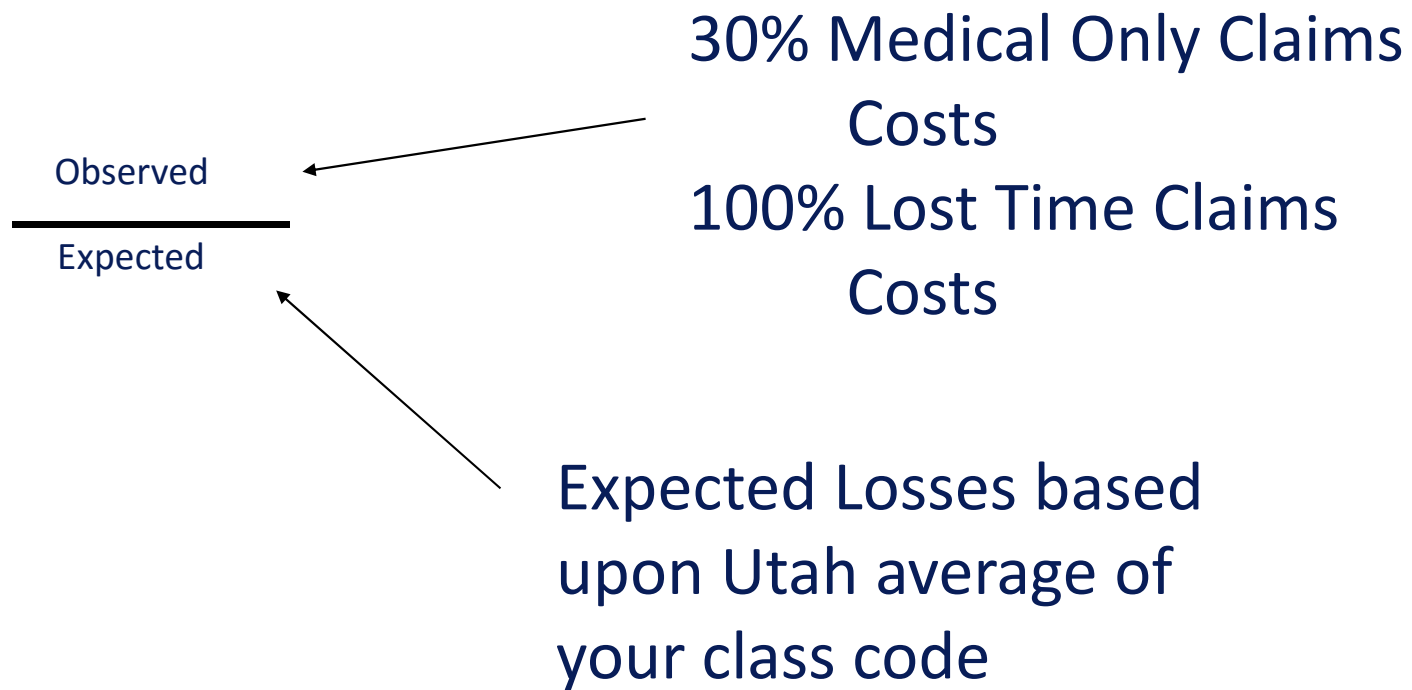
- Data collected to determine rate include:
 - Payroll
 - Claims experience (losses incurred)
 - Data collected has one year lag (3 year period)
 - Example: 2017 calculation uses 2013, 2014, & 2015 data

E-mod Calculation

$$\frac{\frac{\text{Observed}}{\text{Expected}} + \frac{\text{Observed}}{\text{Expected}} + \frac{\text{Observed}}{\text{Expected}}}{3} = \text{E-mod}$$

2017 E-mod evaluates [2013, 2014, 2015]

E-mod Calculation Cont.



Frequency & Severity

- The NCCI looks at both frequency and severity.

How Accidents Affect the Bottom Line

Company A *Standard Rates*

Class Code	Description	Estimated Payroll	Rate per \$100	Premium
2095	Meat Products Mfg.	\$500,000	3.28	\$16,400
	Experience Modification		X 1.15	\$ 2,460
	Total Premium			\$18,860

How Accidents Affect the Bottom Line Company B *Preferred Rates*

Class Code	Description	Estimated Payroll	Rate per \$100	Premium
2095	Meat Products Mfg.	\$500,000	2.60	\$13,000
	Experience Modification	X	.85	(1,950)
	Total Premium			\$11,050

Bottom Line Difference

Company A

Total Premium: **\$18,860**

Company B

Total Premium: **\$11,050**

Difference: \$7,810

Another Example (More Dramatic):
Company A Roofers *Non-Standard Rates*

Class Code	Description	Estimated Payroll	Rate per \$100	Premium
5551	Roofers	\$500,000	22.95	\$114,750
	Experience Modification		X 1.15	\$17,213
	Total Premium			\$131,963

How Accidents Affect the Bottom Line Company B Roofers *Standard Rates*

Class Code	Description	Estimated Payroll	Rate per \$100	Premium
5551	Roofers	\$500,000	18.20	\$91,000
	Experience Modification	X .85		(13,650)
	Total Premium			\$77,350

Bottom Line Difference

Company A

Total Premium: **\$131,963**

Company B

Total Premium: **\$77,350**

Difference: \$54,613

Cost of Injuries Based on Cost of Insurance for Company A:

If we assume 10% profit margin:

$$\frac{\$131,963}{0.10} = \$1,319,630 \text{ in Sales}$$

Schedule Rating Adjustment

- Another multiplier.
- Qualified WCF customers.
- 25% discount or surcharge based on your company's safety programs and risk characteristics.

Schedule Rating Adjustment

- Factors:
 - Existence of written company safety programs
 - Potential hazards/risks of your business
 - Drug free workplace policy
 - Employee management policies
 - Employee safety training
 - Implementation of recommendations

Preventing accidents is the best way to control workers compensation costs and other accident related costs.

Acceptance of accidents is a mindset to overcome. How many accidents are acceptable to have in one year?









ASSOCIATED PRESS







An Effective Safety Program will:

- Prevent/Decrease accidents
- Lower insurance costs
- Reduce cost of hiring & training personnel
- Decrease equipment damage & repair
- Increase productivity
- Improve employee morale



Components of an Effective Safety Program

1. Management Leadership & Commitment
2. Assignment of Responsibility (Accountability)
3. Hazard Identification & Control
4. Employee & Supervisor Training
5. Safety Incentives
6. Workplace Conditioning
7. Medical & Emergency Assistance

Components of an Effective Safety Program

8. Return to Work Programs

9. Accident & Incident Investigation

10. Accident Reporting & Recordkeeping
Activities

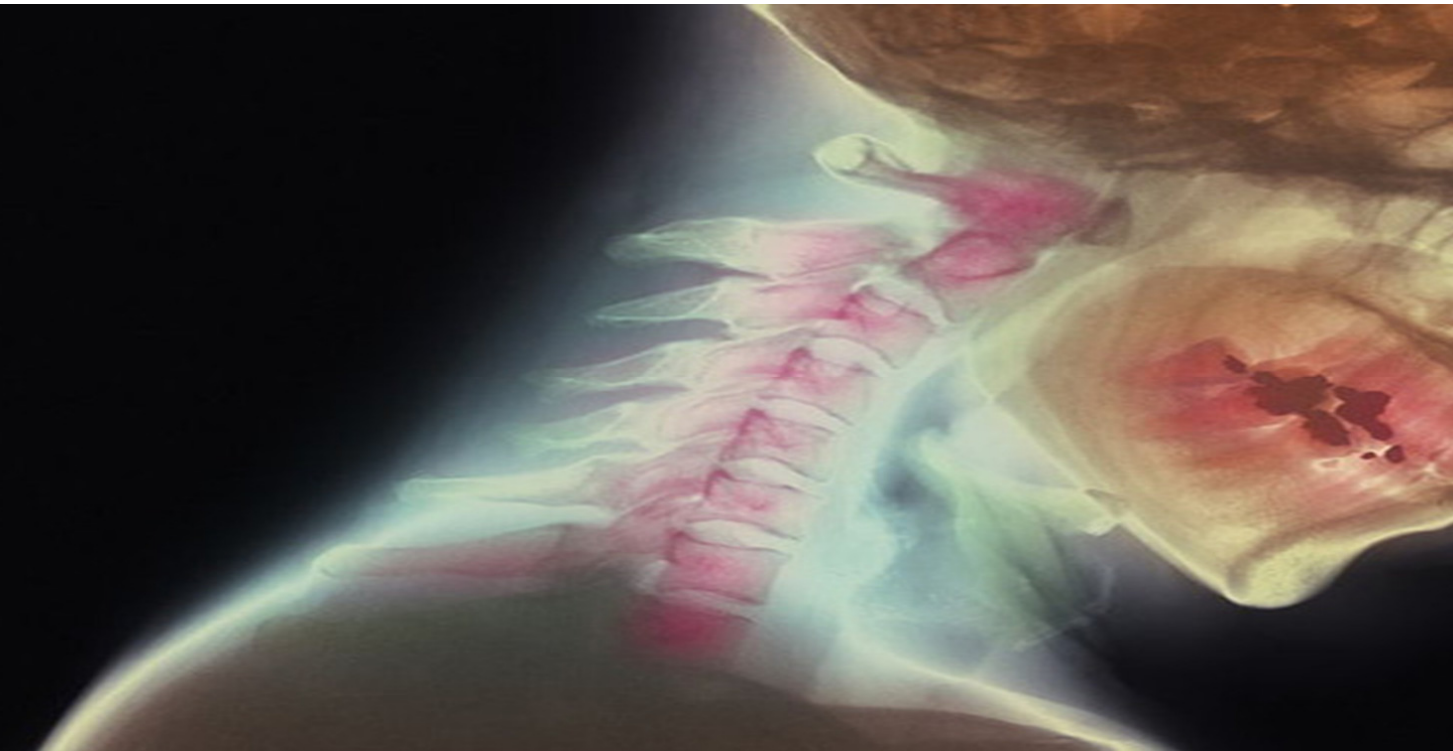
Other Programs That Help Prevent Accidents

- Drug free workplace
 - pre-employment testing
 - post accident testing
 - random testing
 - for cause testing
- Careful employee selection
- Discipline policy/programs used to enforce company safety policy

Thank You!

Severe Injury & Fatality Prevention Working on Solutions

Darren Spencer, CSP



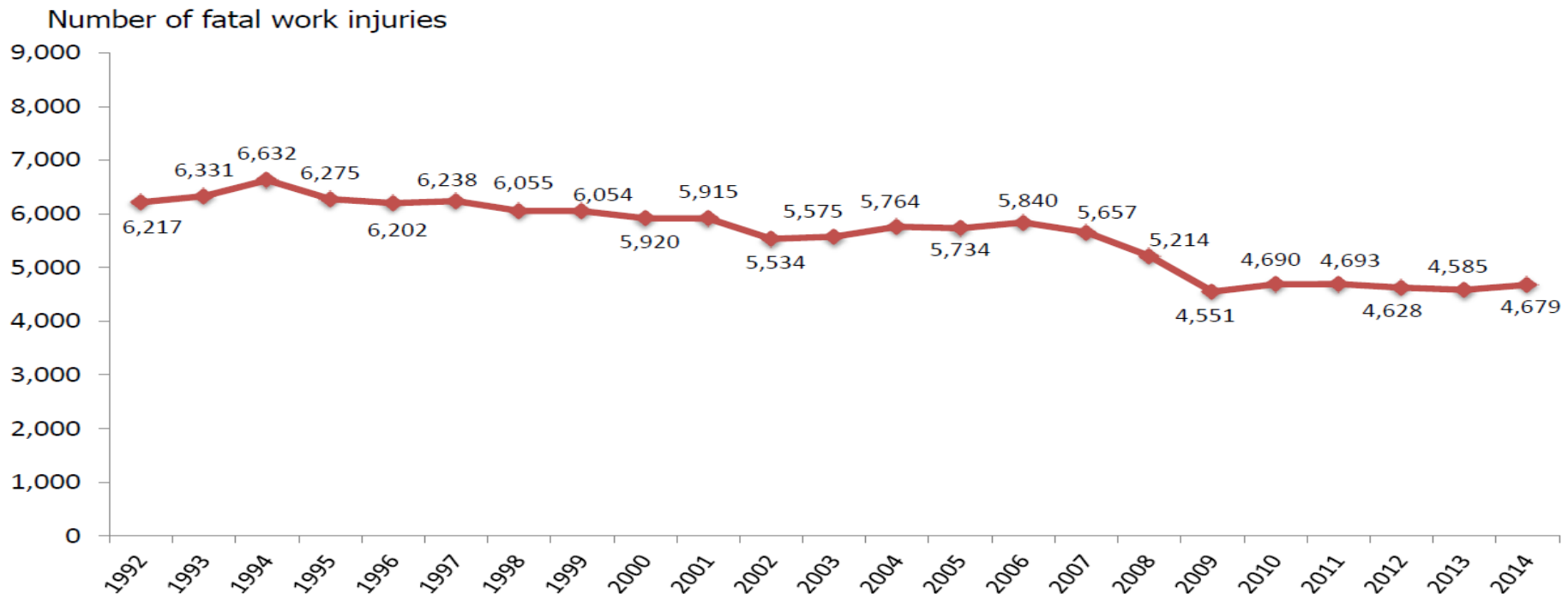
WCF
INSURANCE

Overview

- Severe Injury & Fatality (SIF) Trends (US & WCF)
- Traditional Safety Strategies
- Measuring Safety Performance on Outcomes
- Normalization of Deviations
- The Role of Safety Culture
- Risk Assessments & Near Miss Investigation
- Human Performance Indicators
- Wrap up & Final Discussion

National Fatality Statistics (www.bls.gov)

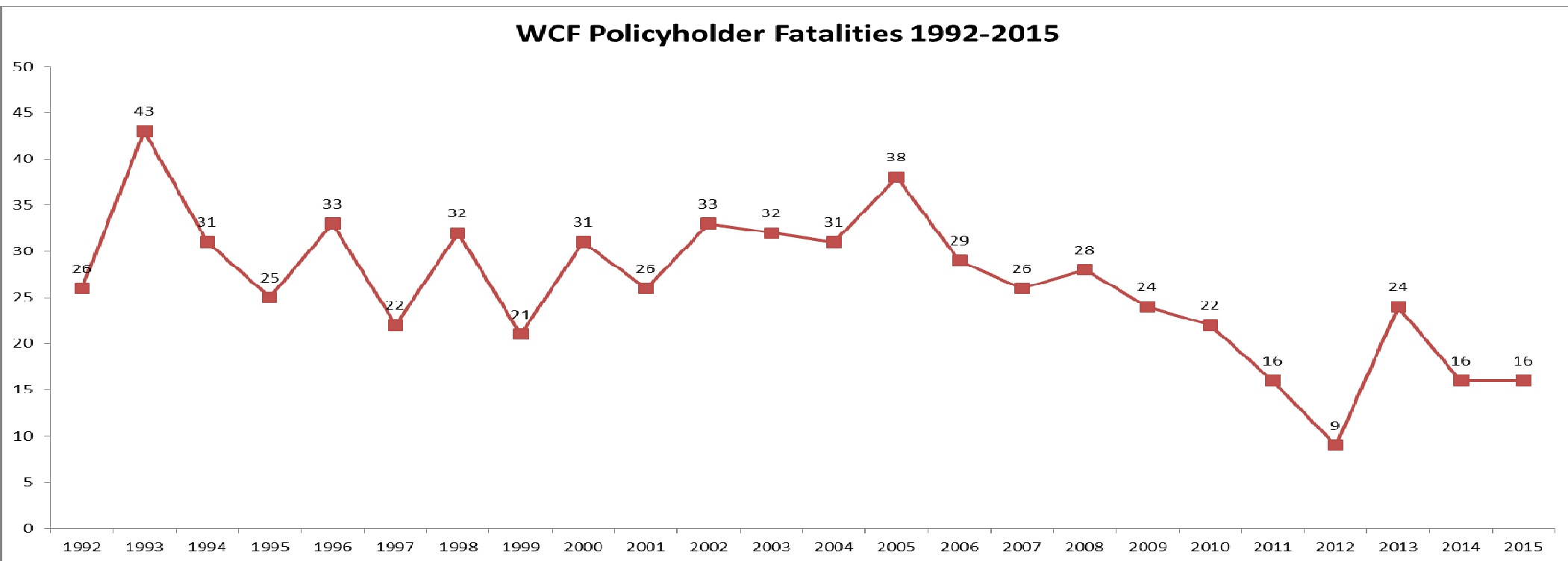
Number of fatal work injuries, 1992–2014*



The preliminary total of 4,679 fatal work injuries in 2014 was 2 percent higher than the final count of 4,585 fatal work injuries reported for 2013. The count for 2014 was the highest since 2011.

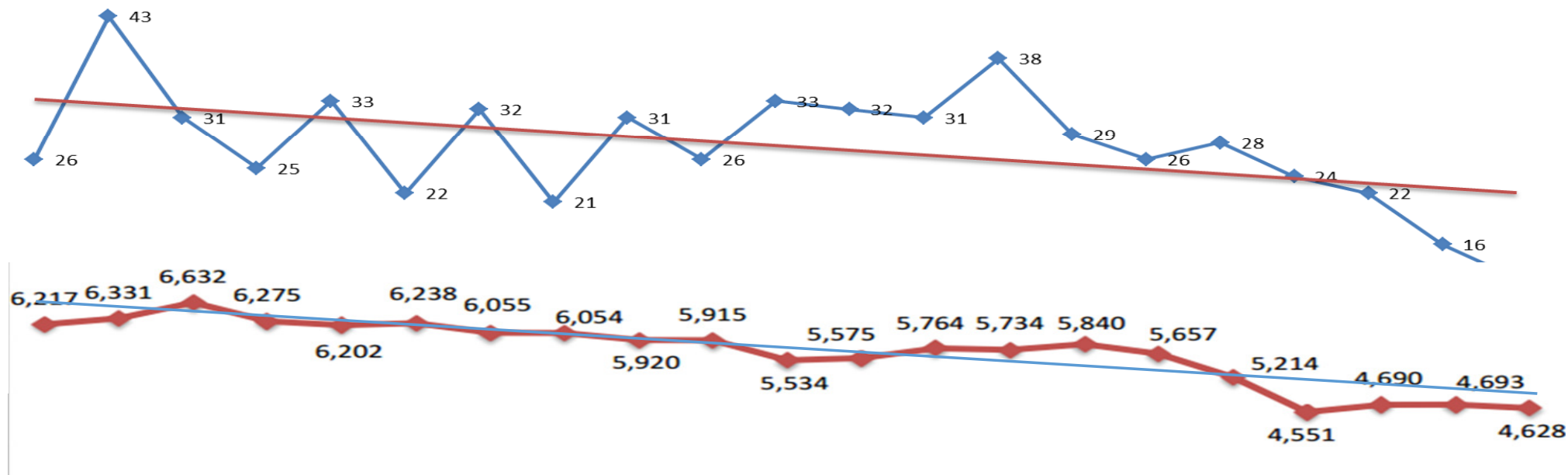
*Data for 2014 are preliminary. Data for prior years are revised and final.
Note: Data from 2001 exclude fatal work injuries resulting from the September 11 terrorist attacks.
Source: U.S. Bureau of Labor Statistics, 2015.

WCF Fatality Statistics



Comparison Fatality Statistics

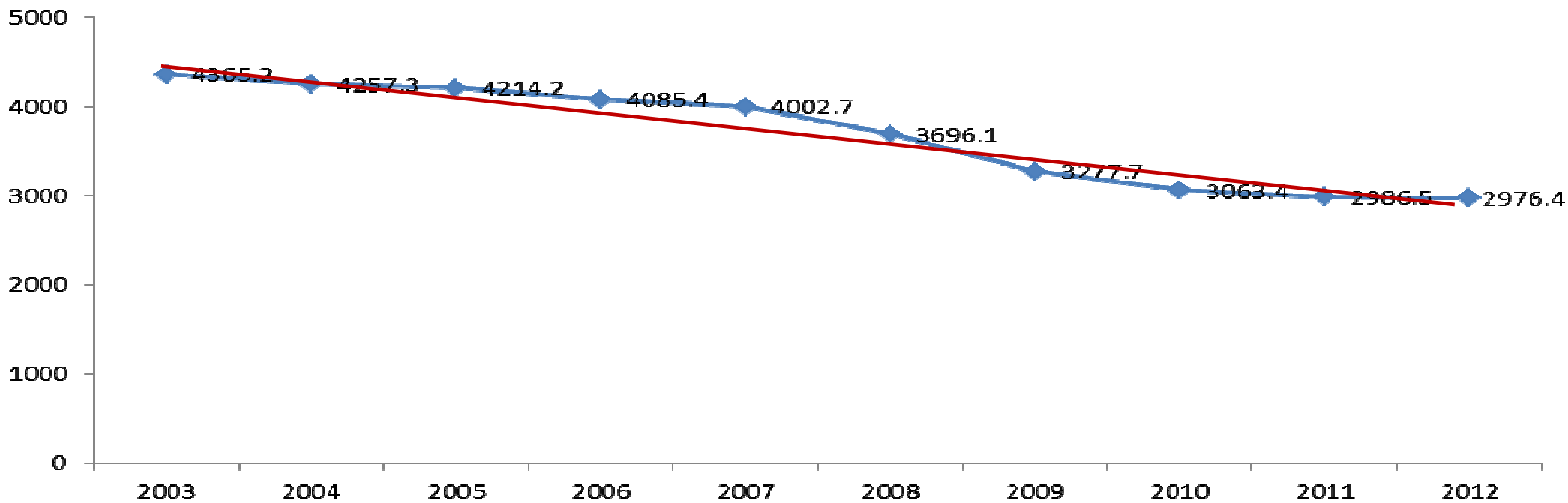
WCF vs BLS



National Non-Fatal Statistics

www.bls.gov

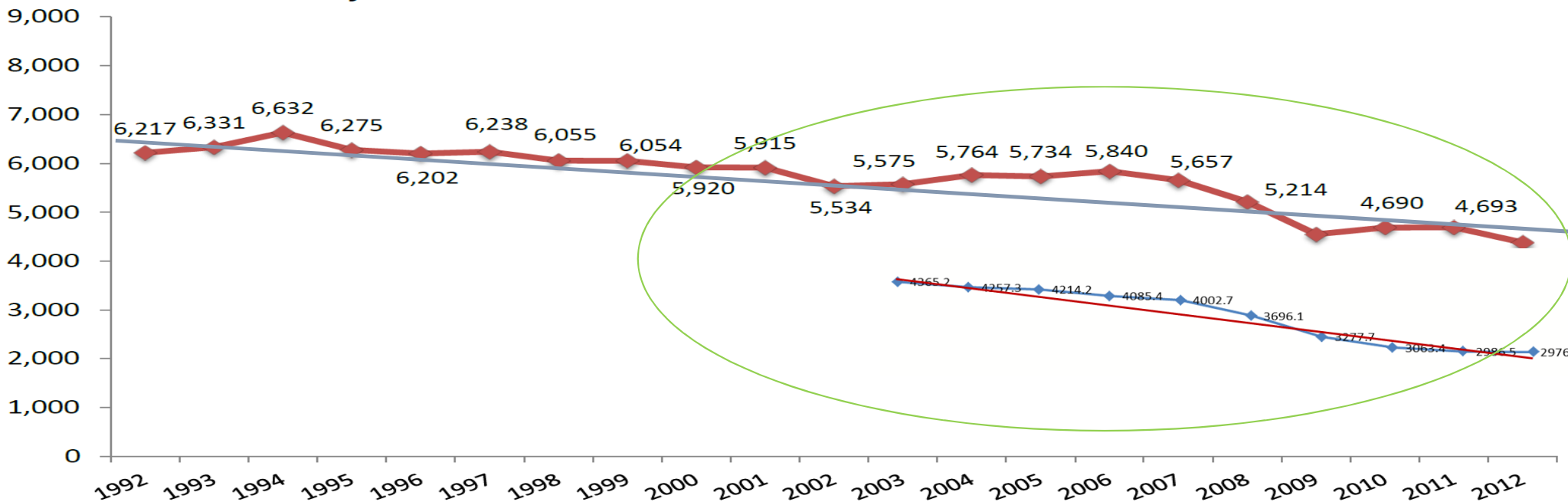
Total Recordable Cases 2003-2012 (In Thousands)



Comparison Fatality vs Non-Fatal

www.bls.gov

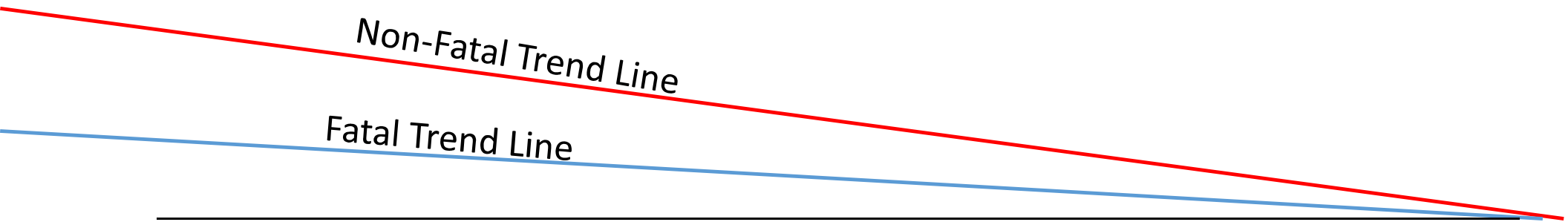
Number of fatal work injuries



NOTE: Data from 2001 exclude fatal work injuries resulting from the September 11 terrorist attacks.
SOURCE: U.S. Bureau of Labor Statistics, U.S. Department of Labor, 2013.

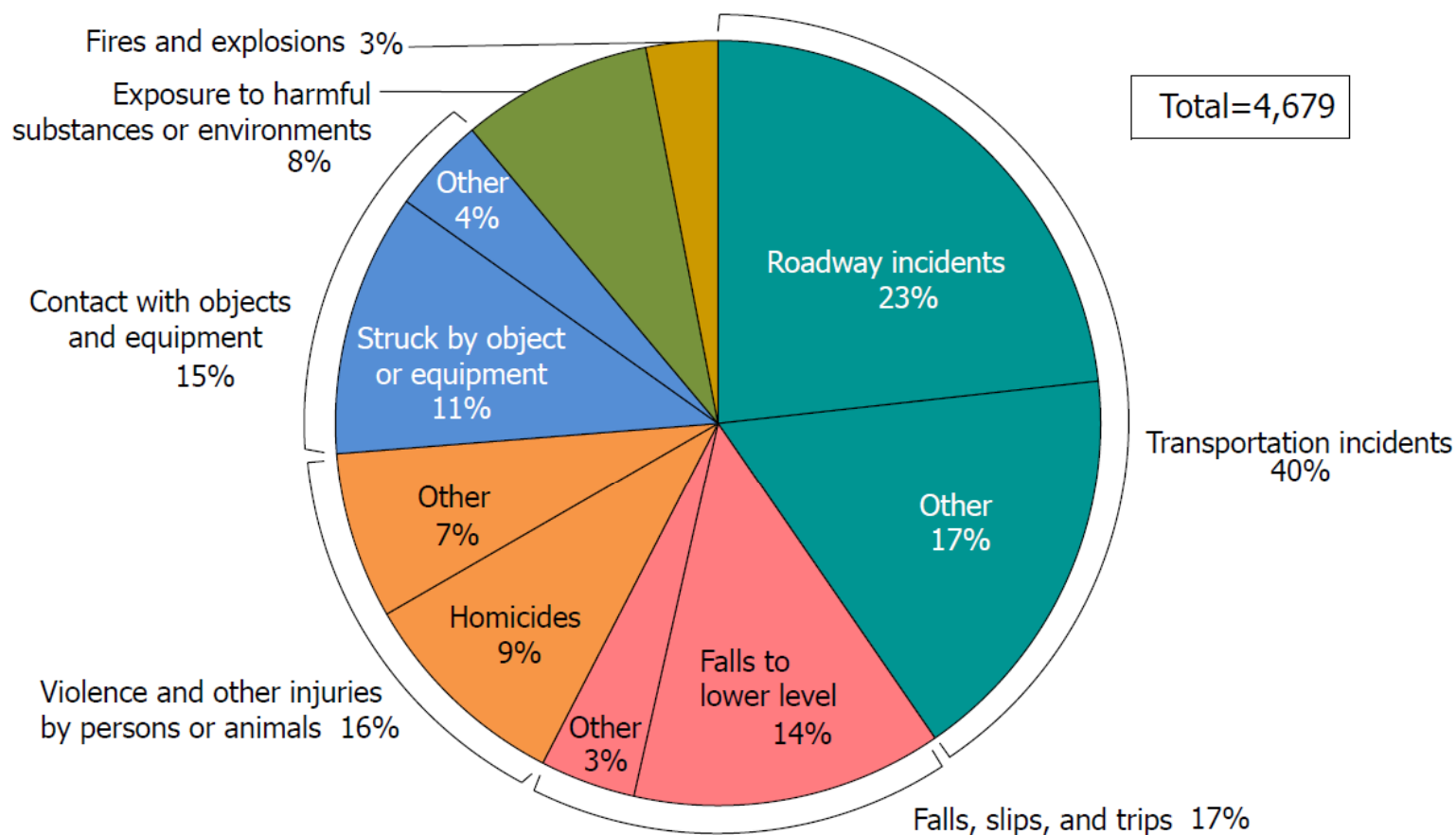
Comparison Fatality vs Non-Fatal

www.bls.gov



Fatalities are not decreasing at the same rate!

Fatal occupational injuries by major event, 2014*



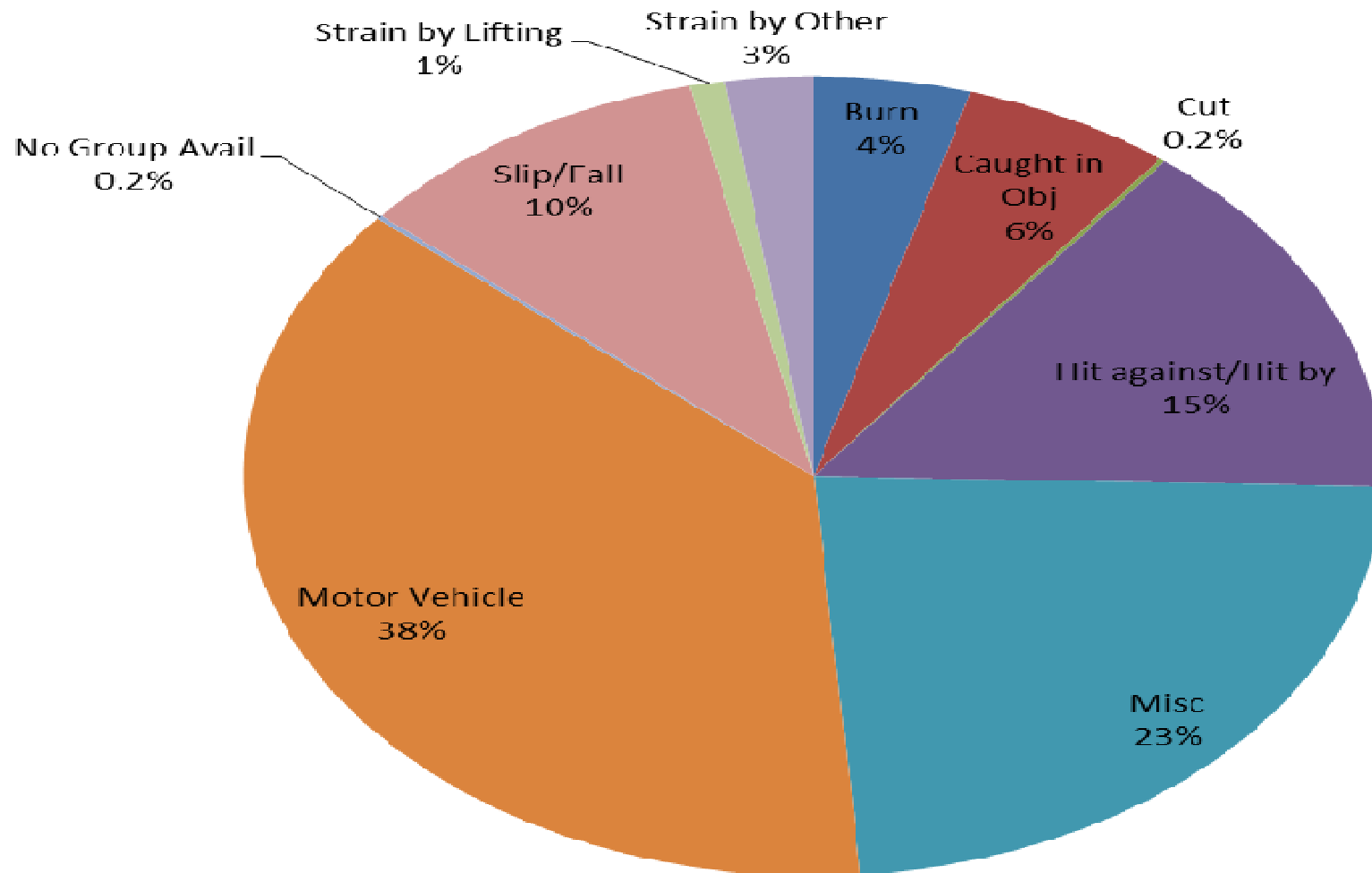
More fatal work injuries resulted from transportation incidents than from any other event in 2014. Roadway incidents alone accounted for nearly one out of every four fatal work injuries.

*Data for 2014 are preliminary.

Note: Transportation counts presented in this release are expected to rise when updated 2014 data are released in spring 2016 because key source documentation detailing specific transportation-related incidents has not yet been received. Percentages may not add to 100 due to rounding.

Source: U.S. Bureau of Labor Statistics, 2015.

WCF Fatalities by Accident Type Group 1992-2013



Work Operations/Tasks Associated With Severe Injury & Fatality Risk

- Working from heights
- Driving exposures
- Lockout/Tagout
- Confined spaces
- Machine guarding
- Crane operations
- Trenching and shoring/Excavation
- Bulk quantities of acutely hazardous chemicals
- Any situation involving upset conditions, non-routine work, or a change in plans.

Making a living shouldn't have to cost you your life. Workplace fatalities, injuries, and illnesses are preventable. Safe jobs happen because employers make the choice to fulfill their responsibilities and protect their workers.

— Dr. David Michaels *Assistant Secretary of Labor for Occupational Safety and Health*

Traditional Safety Efforts and Prevention of Severe Injuries/Fatalities

- Traditional safety efforts have significantly reduced the frequency of injuries in the workplace.
- Why do they often fall short for predicting and preventing SIF?
- What changes can we make to our safety programs and safety efforts to identify and control SIF exposures?

Traditional Safety Efforts Usually Focus on Outcomes

- Lagging Indicators
 - OSHA incident rate, DART rate
 - OSHA compliance inspections
 - Workers Compensation claims
 - Experience Modification Factor (EMOD)
- Are lagging indicators a good measurement tool for predicting total injuries?
- Are lagging indicators a good measurement tool for predicting SIF?

Safety Incentive Programs or Goals

- Traditional safety incentive programs reward employees for working a specified period of time without reporting an injury.
 - “zero accident” or “days without an accident”
- - Safety Incentive Programs
 - Do they decrease accidents?
 - Do they decrease accident reporting including reporting of near misses?
 - Was employee making any effort to be safe or did they just get lucky for a certain period of time?
- Effective incentive programs focus on leading indicators instead of avoiding bad outcomes.

Traditional Safety Efforts

Do We Accept/Reward Risk Taking?

- It Often Depends on the **Outcome**.
- Poor decisions that result in bad outcomes are generally not accepted.
- Poor decisions that still result in success are often accepted and sometimes rewarded.
- How are good decisions that still result in delays, increased costs, or smaller losses viewed in your organization?



Focusing on Safety Outcomes can lead to a false sense of security

- “All is Well” at our company because we haven’t had the bad outcome yet
- Most Fatalities/SI are low probability
 - “Potential” explosions, falls, crashes don’t make news
 - “It has never happened before” syndrome
- Unsafe behaviors may be ignored or even rewarded based on a good outcome
- A balanced approach identifies critical operations and measures leading and lagging indicators

Near Miss Incidents

- What is the definition of a Near Miss?
- Are near misses a leading or lagging indicator?
- What makes the difference between a near miss and a severe accident?
- Why do we ignore near misses?
 - Frequent near misses can lead to:
 - False sense of security--its not going to happen to me
 - Normalization of deviations

Normalization of Deviance

- Getting away with bad behavior
- We get used to it if there is no bad consequence
- Abnormalities without consequence become the “new normal” leading to:
 - Not following procedures all the time
 - Relying on “common sense” of employees

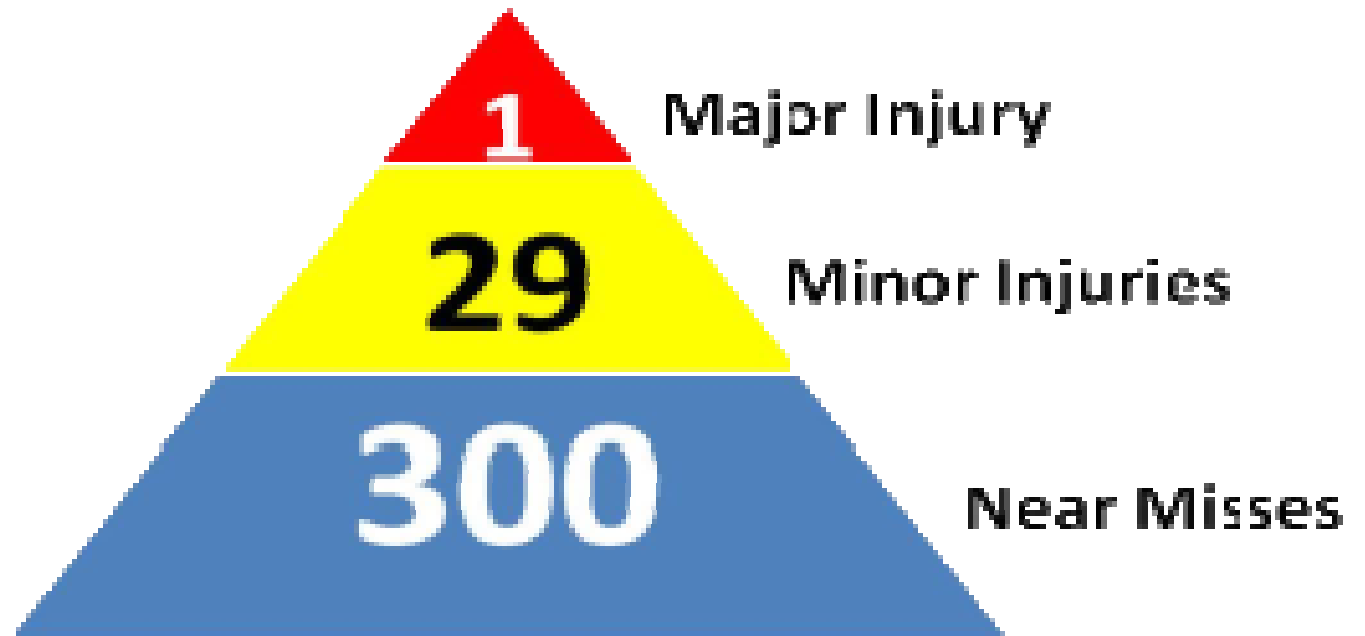




A Shift in Safety Management Theory



Herbert William Heinrich



The Heinrich 300-29-1 Model

Frank E. Bird



1 Serious or Disabling
Injury

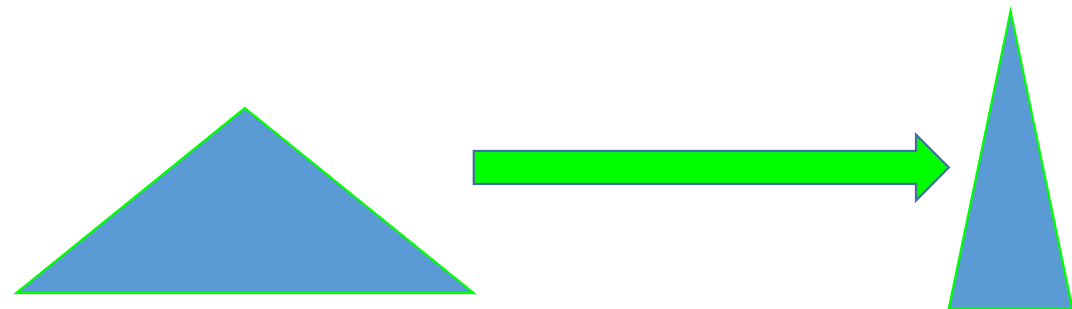
10 Minor Injuries

30 Property Damage
Accidents

600 Incidents or near
Misses

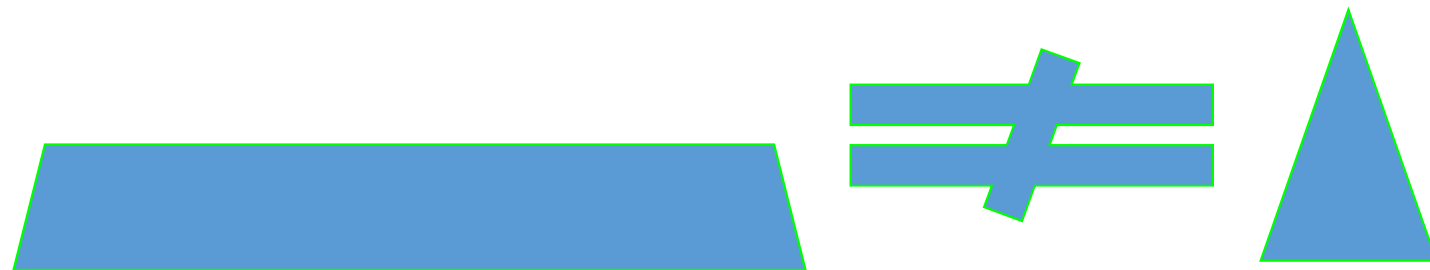
A Shift in Safety Management Theory

- Historically the safety community viewed injury prevention through the paradigm of Heinrich's, Bird's or other's **Safety Triangles**
- There is a **fixed ratio** between serious and less serious injuries
- All types/severities of injuries have the **same underlying causes**



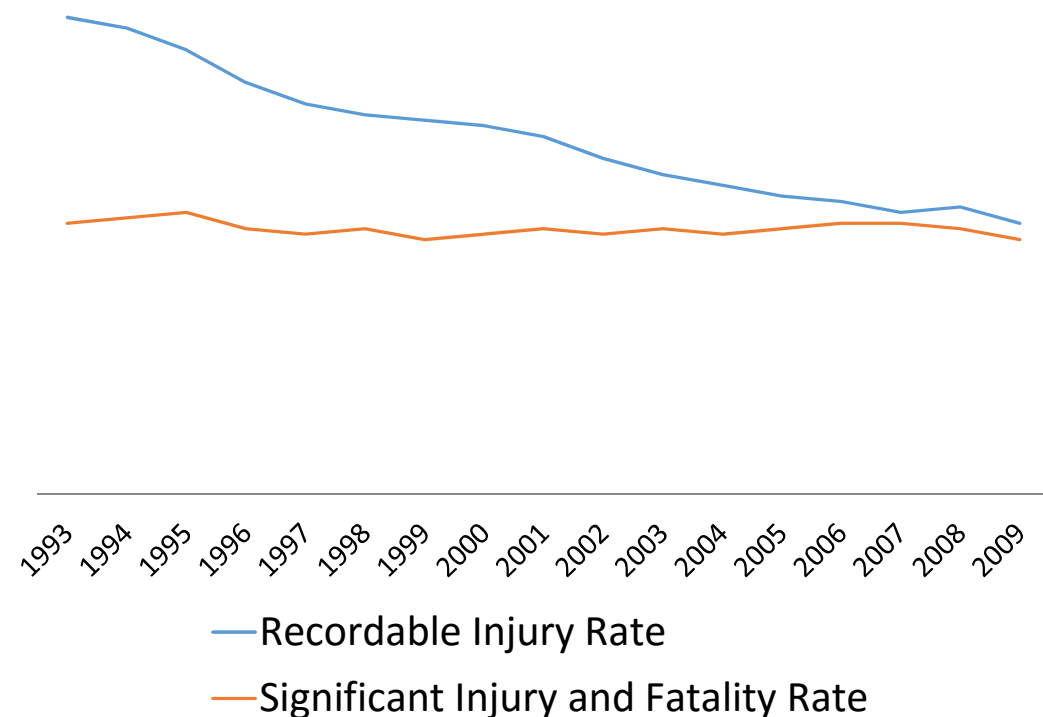
A Shift in Safety Management Theory

- Reducing the frequency rate of minor injuries will lead to **corresponding** reduction of major injuries
- You must work at the **base** of the “Triangle” to prevent injuries
- **Unsafe acts and unsafe conditions** were at the root of all injuries



New Understanding of Serious Injuries and Fatalities

Occupational Fatalities and Nonfatalities

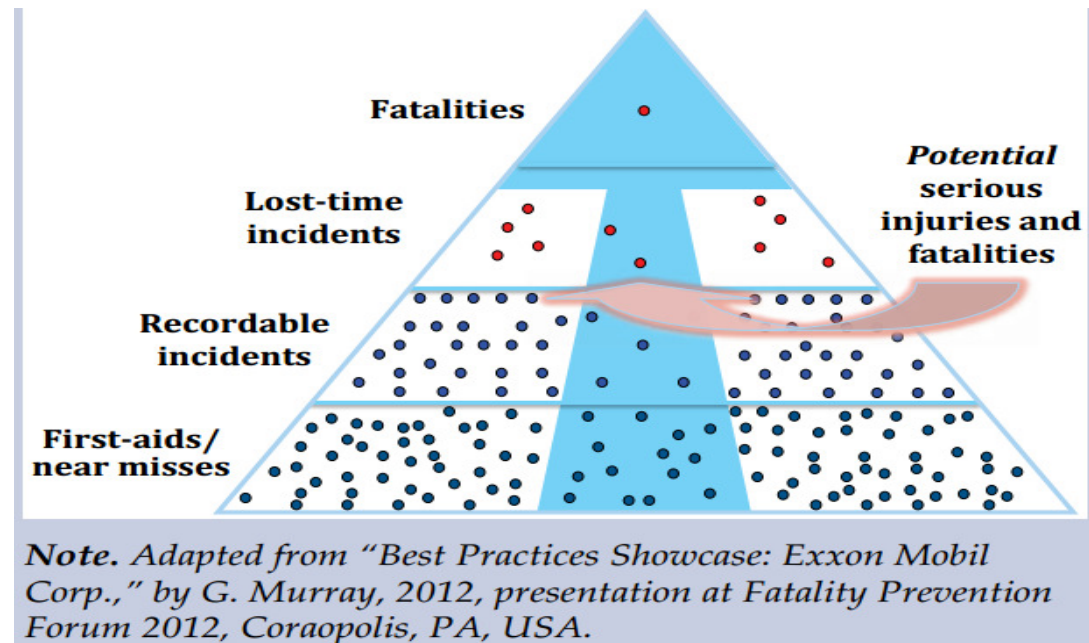


- A recent injury pattern has emerged across organizations and industries.
- Recordable and lost time injuries are *declining* steadily, at the same time serious injuries and **fatalities** are level or **increasing**.

New Understanding of Serious Injuries and Fatalities

- New insights that are disturbing to leading organizations:

- 1) Not effectively reducing devastating injuries.
- 2) New data is in contradiction with Heinrich's Safety Model

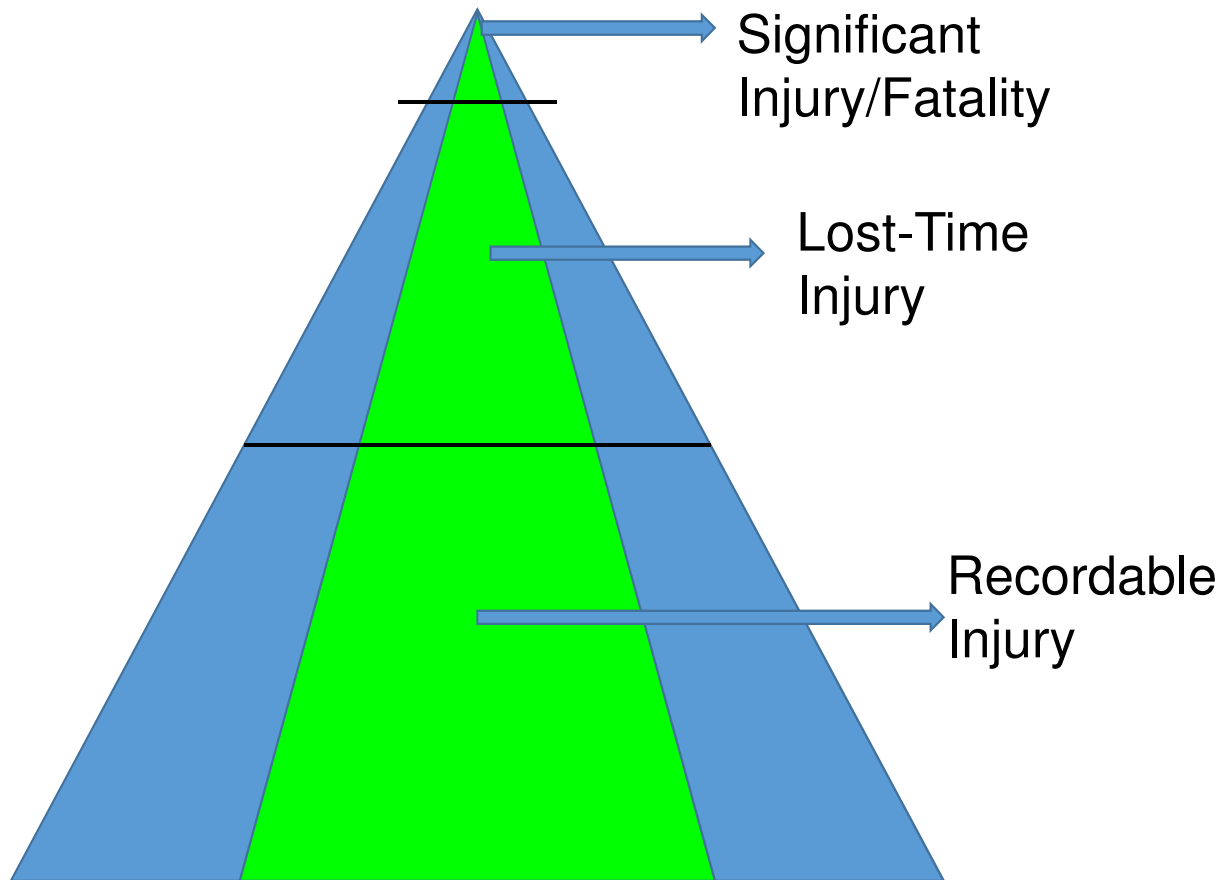


A Shift in Safety Management Theory

- Think about how your organization is doing in accident prevention efforts...
- Chances are your organization is performing at a high level when it comes to total number of recordable accidents.
- Have your expensive injury claims decreased in the same manner?



New Understanding of Serious Injuries and Fatalities



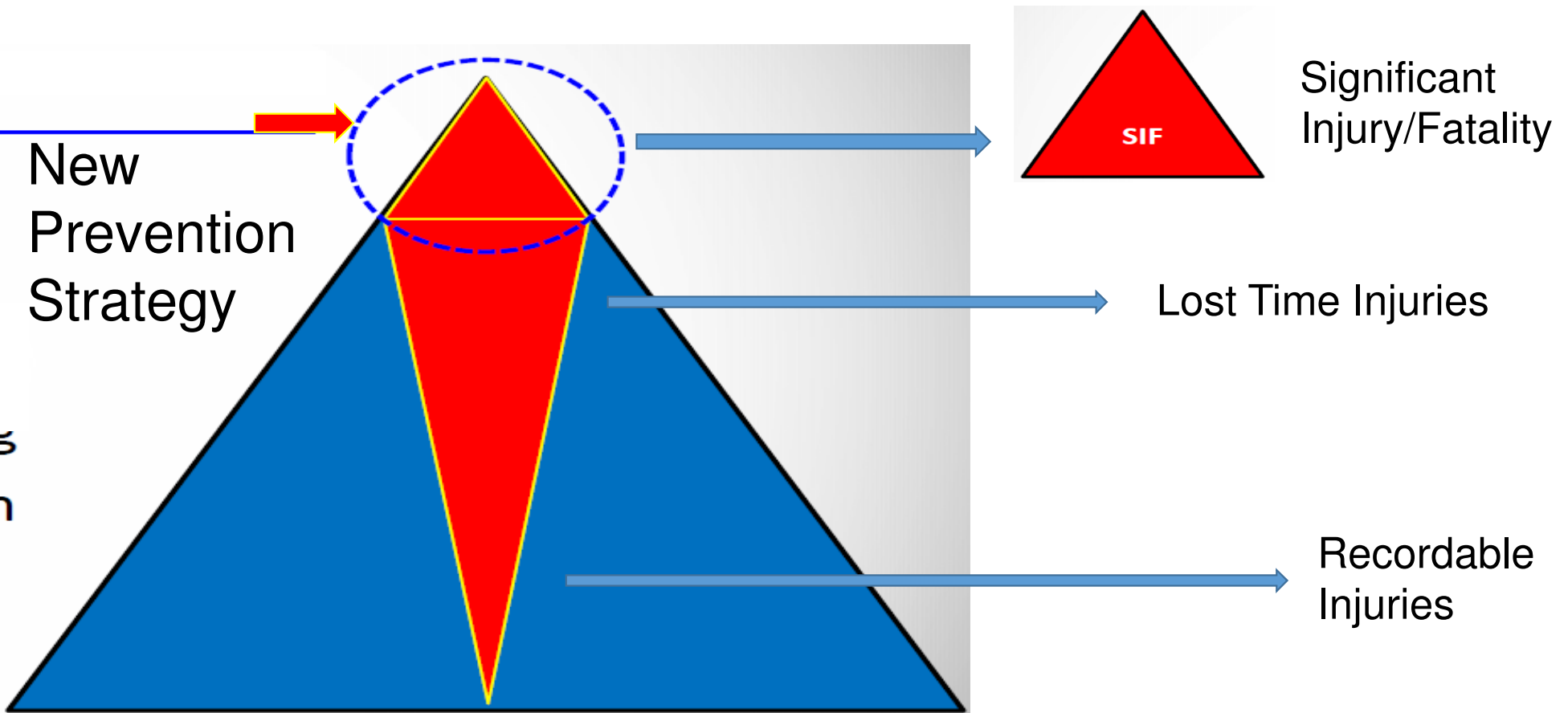
- Heinrich claimed that reducing injuries at the bottom of the triangle will result in proportionate reduction at the top.
- If this claim is true, then recordable injuries and serious and fatal injuries would decline in parallel, which they are not.

A Shift in Safety Management Theory

- Recordable and Lost-Time injuries can be divided into two categories:



Only About 20% of Recordable and Lost-Time Injuries had the potential to be serious





Lifesaving Rules

- Lifesaving rules are used to prevent injury associated with **high risk activities**—not common sense.
- Lifesaving rules are important, but they are the **last line of defense**. If they fail, the risk of a serious injury is very high.
- Certain high risk situations act as **precursors** for serious injuries.

A Shift in Safety Management Theory

Precursor: an unmitigated high risk situation that will eventually result in a serious injury if allowed to continue.

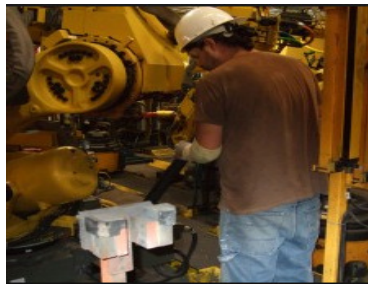




Likely Precursors

- 1) Vehicles
- 2) Workplace Violence
- 3) Gravity
- 4) Mechanical
- 5) Electrical

- 6) Stored Energy
- 7) Chemical
- 8) Thermal
- 9) Radiant Energy



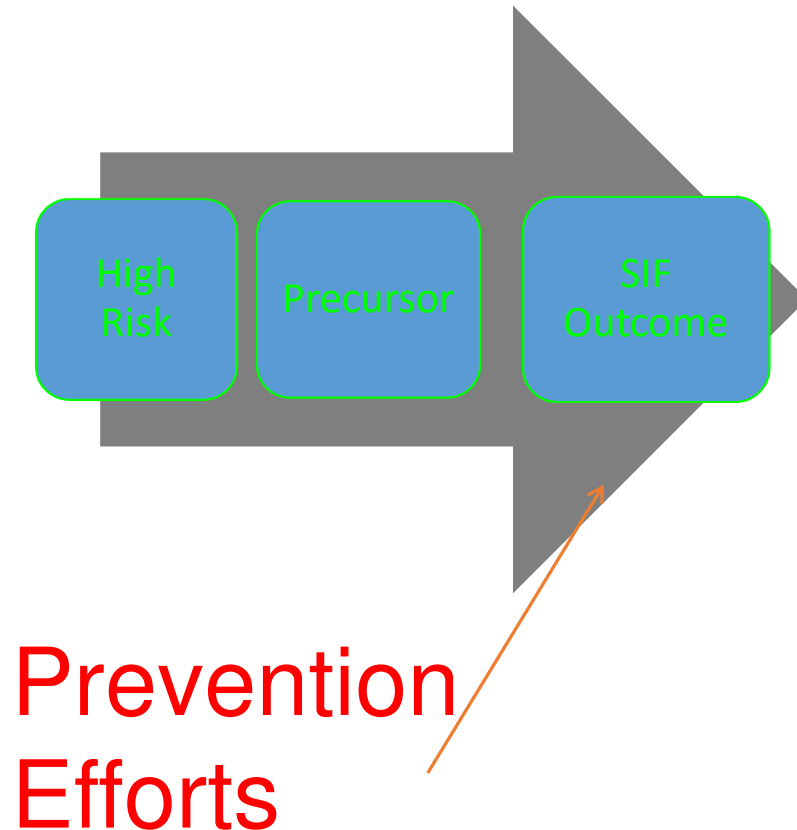


Non-Routine Event

- Series of high-risk, infrequently performed tasks.
- Tasks are tightly coupled, time constrained, and vulnerable to single point failures.
- Non-routine events are a common source of fatalities and severe losses.

A Shift in Safety Management Theory

- The new model says that certain kinds of situations give rise to precursors which are followed by serious and fatal injuries.
- Prevention efforts need to identify and focus in on these critically important precursors.



100% Compliance

- Identify **high-risk** activities
- Specific policies/procedures addressing severe injuries/fatalities should be developed
- Employees should be trained on and sign off on procedures/policies
- 100% compliance should be required

Written Policy Examples

- Seat Belt Policy
- Cell Phone/Electronics Policy
- Fall Protection
- Lockout/Tagout
- Confined Space
- Live Electrical Work-Permit

A Shift in Safety Management Theory

- These studies don't suggest that less attention should be paid to preventing injuries that are more common and less severe.



Safety Management Theory Summary

- Serious injuries and fatalities are **increasing** in frequency
- Less serious injuries are steadily declining
- The potential for serious injury is present in only 20% of less serious injury
- More serious injuries often have different causes



Safety Culture

Studies have shown that a strong safety culture can help to reduce the frequency and severity of workplace, injuries and illnesses.

Why are employees unsafe?

“Mistakes arise directly from the way the mind handles information, not through stupidity or carelessness.” – Edward de Bono
PhD

Unsafe behavior is often rewarding

- Saves time
 - Convenience
 - Comfort
 - Negative consequences unlikely
-
- To develop a strong safety culture we must overcome these hurdles.



Traditional Safety Approach

- Management driven
- Rules and regulations
- Reports violations
- Uses discipline
- Provides little feedback-rarely a “thank you”
- Measures success with trailing indicator rates
- Sees occasional improvement

Leading Indicators

- Audits (PPE, Housekeeping, Guarding, Etc.)
- New employee orientation activities and safety training
- Consistency of ongoing employee safety training efforts
- Participation of line supervisors in key safety activities
- Participation of senior managers in key safety activities
- Number of Safety Inspections completed
- Turnaround time on safety related work orders
- Completion of key safety certifications by workers and supervisors
- Risk Assessments/JSA's Completed
- Safety Observations
- Safety Suggestions
- "Near Misses"

RISK MANAGEMENT

Identifying, Assessing, Prioritizing & Reducing Risk





Risk Defined:

- Risk = Severity X Probability
- Risk = Severity X Probability X Exposure



Three Key Concepts

1. Incidents are the result of **uncontrolled or inadequately** controlled risk
2. Risk can and must be managed
3. To effectively impact incidents we must manage our risks





Hazard Evaluation- Setting Parameters

- Sample company risk parameters for a hazard

Likelihood/Probability	Severity
Almost Certain (4)	Major Event (4)
Could Happen (3)	Severe (3)
Unlikely (2)	Moderate (2)
Extremely Unlikely (1)	Minimal (1)

- Note:
 - “Severe” is a likely disabling injury
 - “Major Event”- fatality or several disabling injury

Using a Risk Assessment Matrix

Risk Assessment Matrix				
Probability	Severity			
	Minimal (1)	Moderate (2)	Severe (3)	Major Event (4)
Almost Certain (4)	B	B	A	A
Could Happen (3)	C	B	A	A
Unlikely (2)	C	C	B	B
Extremely Unlikely (1)	C	C	C	B

- **Class C Hazard**: Continue with task after completion of required actions.
- **Class B Hazard**: Stop! Inform supervisor. Develop and implement controls.
- **Class A Hazard**: Stop! Inform supervisor. Complete a Job Hazard Analysis.

Reported on

6/20

Live Leak



Near Miss Tracking

- Benefit
- Why not ignore?
- What can be learned?
- When should we investigate?
- What was the potential for hurt?
- Track SIF as closely as injury rate

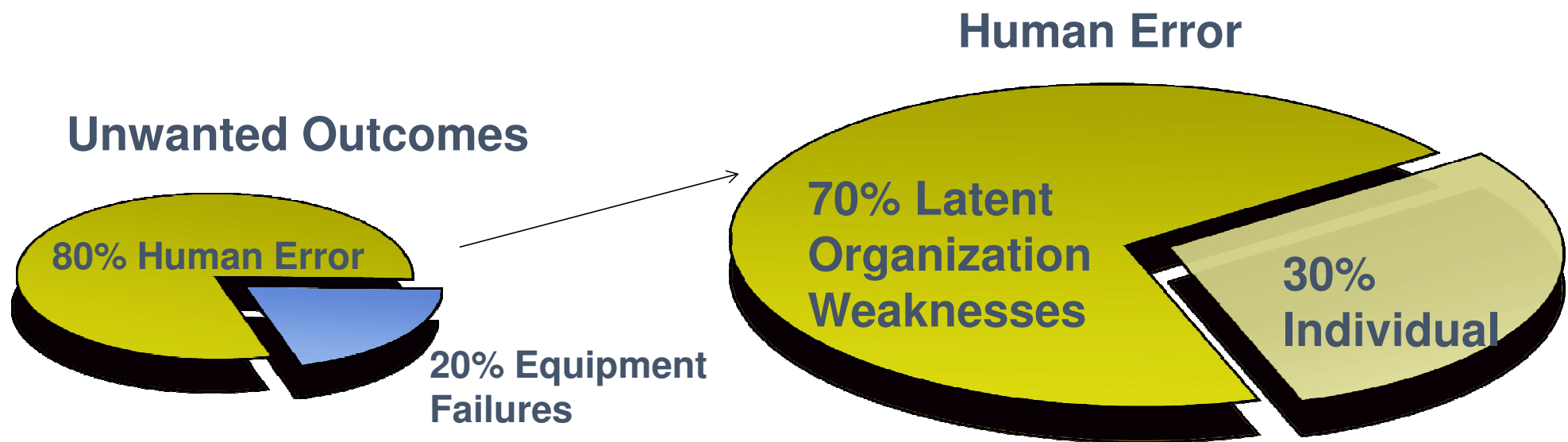
Purpose of Human Performance

To proactively prevent “Unwanted Outcomes” triggered by human error.

Reducing Errors should not be the primary focus. It should be reducing the consequences of errors!



WHY A HUMAN PERFORMANCE IMPROVEMENT APPROACH?



FACTS ABOUT HUMAN ERROR

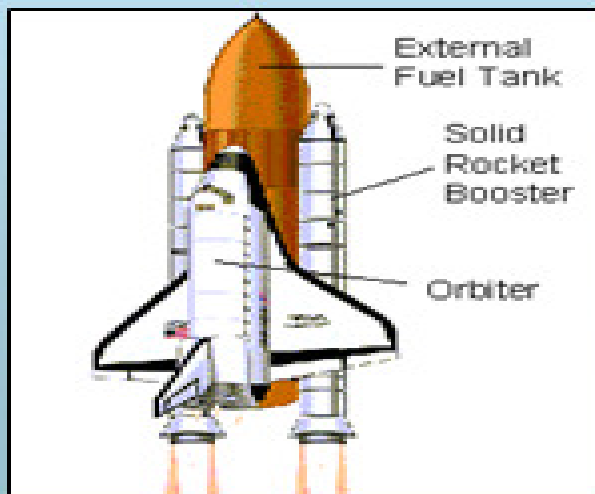
- It thrives in every industry
- It is a major contributor to events and unwanted outcomes
- It is costly, adverse to safety and hinders productivity
- The greatest cause of human error is weaknesses in the organization, not lack of skill or knowledge
- Error rates can never be reduced to zero
- Consequences of errors can be eliminated

Principles

1. People are fallible, and even the best make mistakes.
2. Error-likely situations are predictable, manageable, and preventable.
3. Individual behavior is influenced by organizational processes and values.
4. People achieve high levels of performance based largely on the encouragement and reinforcement received from leaders, peers, and subordinates.
5. Events can be avoided by understanding the reasons mistakes occur and applying the lessons learned from past events.

Challenger...

- Liquid hydrogen tank explodes, ruptures liquid oxygen tank
- Resulting massive explosion destroys the shuttle



The Legacy of Challenger

- **The Rogers Commission, which investigated the incident, determined:**
 - The SRB joint failed when jet flames burned through both o-rings in the joint
 - NASA had long known about recurrent damage to o-rings
 - Increasing levels of o-ring damage had been tolerated over time
 - Based upon the rationale that “nothing bad has happened yet”



“I’ve done it this way a 100 times” “We have never had a problem before”

O-Ring Problems

- As early as 1971 and 1977 engineers said O-Ring design was flawed but was accepted in 1980 as flight worthy anyway
- Evidence of O-Ring problems showed up in the 2nd shuttle flight
- NASA waived their own procedures 6 times and flew knowing the risk, before the loss of the shuttle and crew in 1986

NASA Shuttle Losses and the “Normalization of Deviance”

- Term was coined by Dr. Diana Vaughn, a sociologist, in her book *The Challenger Launch Decision*
- “the gradual process through which unacceptable practice or standards become acceptable”
- There are crucial lessons for the practice of Safety in all organizations in her Book and in the Columbia Accident Investigation Board (CAIB) report

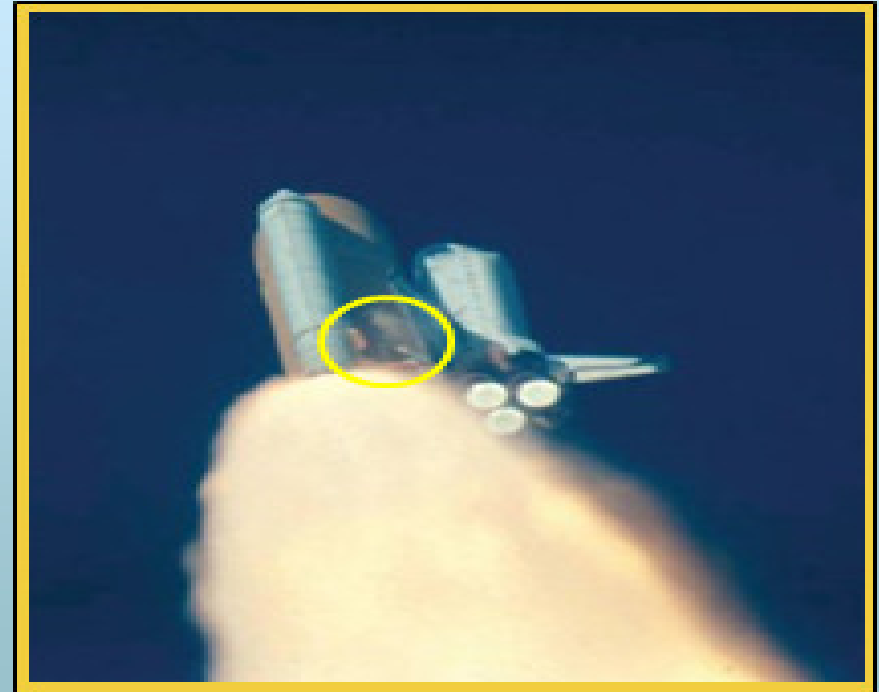
Columbia- The Physical Cause

- Insulating foam separates from external tank 81 seconds after lift-off
- Foam strikes underside of left wing, breaches thermal protection system (TPS) tiles
- Superheated air enters wing during re-entry, melting aluminum struts
- Aerodynamic stresses destroy weakened wing



A Flawed Decision Process

- Foam strike detected in launch videos on Day 2
- Engineers requested inspection by crew or remote photo imagery to check for damage
- Mission managers discounted foam strike significance
- No actions were taken to confirm shuttle integrity or prepare contingency plans



Analysis using damage prediction software “Crater” was conducted – personnel were *inexperienced in its use* and erroneously concluded that damage was unlikely

British Petroleum- String of Disasters



2005, 15 killed 180 injured (23 more killed in Accidents in prior 30 years)



Photograph shows several trucks and equipment in the process of cleaning up oil spills from an oil transit line leak in Alaska.

2006,
4800
barrels
spilled



11 dead, 17 injured, 4.9M barrels spilled

A Tale of Two Companies : British Petroleum vs Exxon

- The US government report issued in September 2011 ...stated that, although the events leading to the sinking of Deepwater Horizon were set into motion by the failure to prevent a well blowout, the investigation revealed numerous systems deficiencies.
- The loss of life and the subsequent pollution of the Gulf of Mexico were the result of **poor risk management, last-minute changes** to plans, **failure to observe and respond to critical indicators, inadequate well control response**, and **insufficient emergency bridge response training** by companies and individuals responsible for drilling at the Macondo well and for the operation of the drilling platform.

(35,050 ft deep well in 5,100 ft of water)

The Macondo disaster was the last in a series of spectacular BP safety failures

Exxon



After the 1989 Exxon Valdez disaster the company vowed “never again”.

“That accident was the low point in ExxonMobile’s history. But it was also a turning point” (Rex Tillerson, Chairman)

Exxon Blackbeard West Gulf Well (2005)



- Ultradeep like Macondo (32,000 feet) but in shallower water (70ft below sea level)
- Exxon's Drillers encountered similar problems as BP did at Macondo
- Exxon's risk management assessment called for abandoning the job on the Driller's recommendation
- Chairman of the Board Rex Tillerson approved walking away from the \$187,000,000 investment

What would have happened in your culture?

Oil & Gas Industry Initially Critical of Exxon Decision, But...

“Exxon’s ‘lack of guts’ looks a lot more like justified conservatism and prudence, and a prescient awareness that safety, caution and catastrophic risk avoidance would be key themes as oil companies were forced to push the envelope in search of new oil...the fact is that Valdez pushed Exxon to the highest safety standards in the industry.”

-Deutsche Bank, July 2010

Conclusions



- Most major catastrophes follow some variation of these patterns even if on a smaller scale
- In 2014, 54 Utahans were killed in work related fatalities and WCF insured 16 of them. (BLS data)
- **“Any man's death diminishes me, because I am involved in mankind, and therefore never send to know for whom the bell tolls; It tolls for thee.”**
 - John Donne “No Man is an Island”

Thank you!

