URCA Training – August 10, 2017
Darren Spencer, CSP
OSHA Required Programs

Darren Spencer, CSP
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
- Forklifites
- 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](http://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 its 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
OSHA's Form 300  (Rev 01/2014)

Log of Work-Related Injuries and Illnesses

Please refer to the enclosed section for instructions for completing 11 specific forms that require approximately 1 minute per person, including time to review the instructions, enter data and gather the necessary data needed, e.g. complete and review the collection of information forms. Persons are not required to respond to these forms in connection with any federal, state, or local law, including any federal, state, or local law requiring the collection of information. Persons are not required to respond to this form unless it has been determined to be a requirement of a federal or state law, regulation, or other authority. Persons have the right to object to providing this information to another person who has the right to provide this information to another person.

<table>
<thead>
<tr>
<th>Identity the person</th>
<th>Describe the case</th>
<th>Classify the case</th>
<th>Enter the number of days lost or number of work days of illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Case no.</td>
<td>(B) Employee's name</td>
<td>(C) Job title (e.g. Electrician)</td>
<td>(D) Date of injury or onset of illness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Where the event occurred (e.g. Twelve (12) hours after the injury or disease)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Describe the illness, parts affected, and objects/chemicals that caused injury or disease (e.g. Second degree burns on eight fingers from arraignment)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Permanent work disability or permanent disability on Part 1 of this form</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Partial temporary work disability or temporary disability on Part 1 of this form</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Away from work or on job related to illness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>On job due to illness</td>
</tr>
</tbody>
</table>

Attention: This form contains information relating to employees' 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.

U.S. Department of Labor
Occupational Safety and Health Administration

Page 1 of 1
OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year: ________________

U.S. Department of Labor
Occupational Safety and Health Administration
Form approved OMB no. 1239-0036

All establishments covered by Part 1903 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 made for each category. Then write the totals below, making sure you’ve added the entries from every page of the log. If you need no cases, write “0.”

Employees, former employees, and their representatives have the right to review the OSHA Form 300A in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.25 in OSHA’s recordkeeping rule for further details on the access provisions for these forms.

<table>
<thead>
<tr>
<th>Number of Cases</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>days</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>away from work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cases with job</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>transfer or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>restriction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other recordable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8)</td>
<td>(4)</td>
<td>(1)</td>
<td>(5)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Days</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>days away from</td>
<td></td>
<td></td>
</tr>
<tr>
<td>work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>days of job</td>
<td></td>
<td></td>
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<tr>
<td>transfer or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>restriction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8)</td>
<td>(4)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Injury and Illness Types</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of . . .</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Injuries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) Dislocations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Skin disorders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) Hearing loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Respiratory conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) All other illnesses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

б. Reporting entities (the collection of information is mandatory on an as-needed basis) are encouraged to review the limitations, risks, and guidance for data needs and compliance with the collection of information standards. Parties are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you discover

establishing that these estimates or other aspects of this data collection, contact the U.S. Department of Labor, OSHA Office of Standard Analysis, Room N404, 200 Constitution Avenue, N.W., Washington, DC 20210. Please include a complete form in your letter.
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

<table>
<thead>
<tr>
<th>Duration (hours)</th>
<th>Decibel Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>.85</td>
</tr>
<tr>
<td>12</td>
<td>87</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>1.5</td>
<td>102</td>
</tr>
<tr>
<td>1</td>
<td>105</td>
</tr>
<tr>
<td>0.5</td>
<td>110</td>
</tr>
<tr>
<td>0.25 or less</td>
<td>115</td>
</tr>
</tbody>
</table>
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
  • $C_1/T_1 + C_2/T_2 + \ldots =$
  • 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)
- 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

- **Oxygen??**
  - Yes (>19.5%)
  - No (<19.5%)

- **Supplied Air**

- **Contaminant [Conc]**
  - Yes (>19.5%)
  - No (<19.5%)

- **No Respirator**

- **Above OSHA PEL**

- **Below OSHA PEL**

- **What is the Conc.**
  - <10X PEL
  - 10-50X PEL
  - >50X PEL

- **1/2 Face APR**
- **FF APR**
- **SAR**
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 \textit{know} and \textit{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.
Sulfuric Acid

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


3. 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.

4. 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.

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

1. Product Identifier
2. Pictograms
3. Signal word, “Danger!”
4. Hazard Statements
5. Precautionary Statements
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:**

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

- 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

\[
5 \times 20,000 = \$100,000 \quad 50 \times 20,000 = \$1 \text{ Million}
\]
<table>
<thead>
<tr>
<th>Injury Costs (dollars)</th>
<th>Company Profit Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>$10,000</td>
<td>500,000</td>
</tr>
<tr>
<td>$20,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td>$50,000</td>
<td>2,500,000</td>
</tr>
<tr>
<td>$75,000</td>
<td>3,750,000</td>
</tr>
<tr>
<td>$100,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>$500,000</td>
<td>25,000,000</td>
</tr>
</tbody>
</table>

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:

\[
\text{Cost of WC Insurance} = \$ \text{ Needed in Sales} \\
\% \text{ Profit Margin}
\]
EXAMPLE:

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

$400,000 in premiums = $4 Million in Sales

0.10
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
• 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

\[
\frac{\text{Observed}}{\text{Expected}} + \frac{\text{Observed}}{\text{Expected}} + \frac{\text{Observed}}{\text{Expected}} = \text{E-mod}
\]

3

E-mod Calculation Cont.

30% Medical Only Claims Costs
100% Lost Time Claims Costs

Expected Losses based upon Utah average of your class code
Frequency & Severity

• The NCCI looks at both frequency and severity.
How Accidents Affect the **Bottom Line**
**Company A Standard Rates**

<table>
<thead>
<tr>
<th>Class Code</th>
<th>Description</th>
<th>Estimated Payroll</th>
<th>Rate per $100</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>2095</td>
<td>Meat Products Mfg.</td>
<td>$500,000</td>
<td>3.28</td>
<td>$16,400</td>
</tr>
</tbody>
</table>

  Experience Modification  
  X 1.15  
  $2,460

**Total Premium**  
$18,860
# How Accidents Affect the Bottom Line

Company B *Preferred Rates*

<table>
<thead>
<tr>
<th>Class Code</th>
<th>Description</th>
<th>Estimated Payroll</th>
<th>Rate per $100</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>2095</td>
<td>Meat Products Mfg.</td>
<td>$500,000</td>
<td>2.60</td>
<td>$13,000</td>
</tr>
</tbody>
</table>

Experience Modification  \( \times .85 \) \( \quad \) (1,950)

**Total Premium** \( \quad \) $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*

<table>
<thead>
<tr>
<th>Class Code</th>
<th>Description</th>
<th>Estimated Payroll</th>
<th>Rate per $100</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>5551</td>
<td>Roofers</td>
<td>$500,000</td>
<td>22.95</td>
<td>$114,750</td>
</tr>
</tbody>
</table>

Experience Modification  
X 1.15  
$17,213

**Total Premium**  
$131,963
## How Accidents Affect the Bottom Line

**Company B Roofers** *Standard Rates*

<table>
<thead>
<tr>
<th>Class Code</th>
<th>Description</th>
<th>Estimated Payroll</th>
<th>Rate per $100</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>5551</td>
<td>Roofers</td>
<td>$500,000</td>
<td>18.20</td>
<td>$91,000</td>
</tr>
</tbody>
</table>

Experience Modification  \( \times \) .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?
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
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
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.
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

NOTE: Data from 2001 exclude fatal work injuries resulting from the September 11 terrorist attacks.
Comparison Fatality vs Non-Fatal

Fatalities are not decreasing at the same rate!
Fatal occupational injuries by major event, 2014*

- Roadway incidents: 23%
- Transportation incidents: 40%
- Falls, slips, and trips: 17%
- Violence and other injuries by persons or animals: 16%
- Homicides: 9%
- Falls to lower level: 14%
- Other: 7%
- Struck by object or equipment: 11%
- Contact with objects and equipment: 15%
- Exposure to harmful substances or environments: 8%
- Fires and explosions: 3%

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.
WCF Fatalities by Accident Type Group
1992-2013

Motor Vehicle: 38%
Misc: 23%
Hit against/Hit by: 15%
Caught in Obj: 6%
Burn: 4%
Cut: 0.2%
Strain by Other: 3%
Strain by Lifting: 1%
No Group Avail: 0.7%
Slip/Fall: 10%
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--it's 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

1 Major Injury
29 Minor Injuries
300 Near Misses
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

- 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

*Note. Adapted from “Best Practices Showcase: Exxon Mobil Corp.,” by G. Murray, 2012, presentation at Fatality Prevention Forum 2012, Coraopolis, PA, USA.*
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?
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

<table>
<thead>
<tr>
<th>Likelihood/Probability</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Certain (4)</td>
<td>Major Event (4)</td>
</tr>
<tr>
<td>Could Happen (3)</td>
<td>Severe (3)</td>
</tr>
<tr>
<td>Unlikely (2)</td>
<td>Moderate (2)</td>
</tr>
<tr>
<td>Extremely Unlikely (1)</td>
<td>Minimal (1)</td>
</tr>
</tbody>
</table>

• Note:
  – “Severe” is a likely disabling injury
  – “Major Event” - fatality or several disabling injury
Using a Risk Assessment Matrix

<table>
<thead>
<tr>
<th>Probability</th>
<th>Severity</th>
<th>Probability</th>
<th>Severity</th>
<th>Probability</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Certain (4)</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Could Happen (3)</td>
<td>C</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Unlikely (2)</td>
<td>C</td>
<td>C</td>
<td>B</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Extremely Unlikely (1)</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

- **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.
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?

Unwanted Outcomes

- 80% Human Error
- 20% Equipment Failures

Human Error

- 70% Latent Organization Weaknesses
- 30% Individual

80% Human Error
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 2\textsuperscript{nd} 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
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
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)

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 BlackbeardWest 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!