

Severe Injury & Fatality Prevention

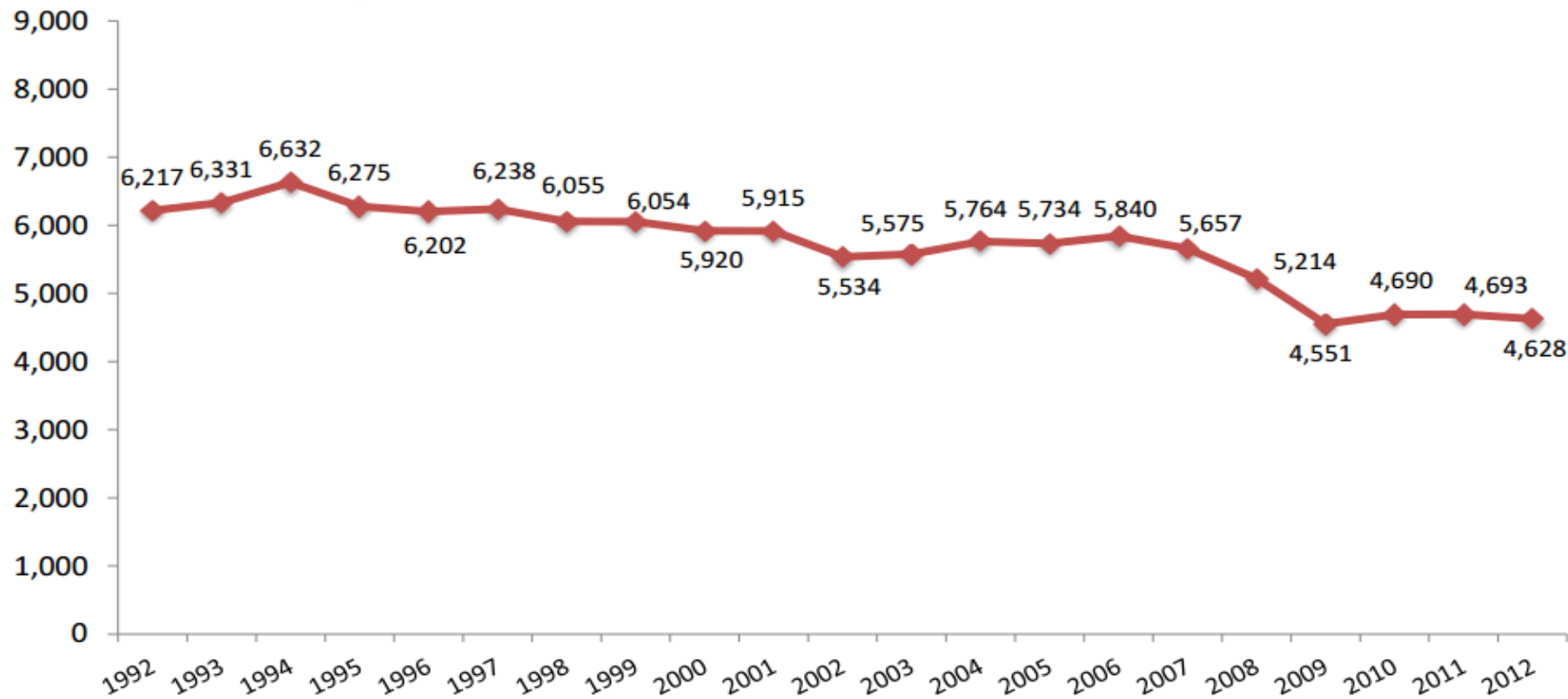
Working on Solutions

National Fatality Statistics

www.bls.gov

Number of fatal work injuries, 1992–2012

Number of fatal work injuries



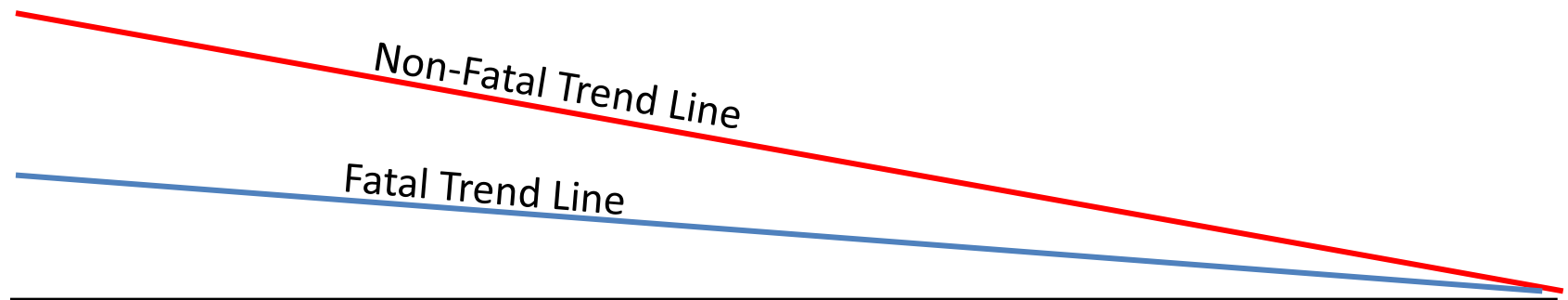
The 2012 total of 4,628 fatal work injuries decreased slightly from the 4,693 fatal work injuries reported for 2011.

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.

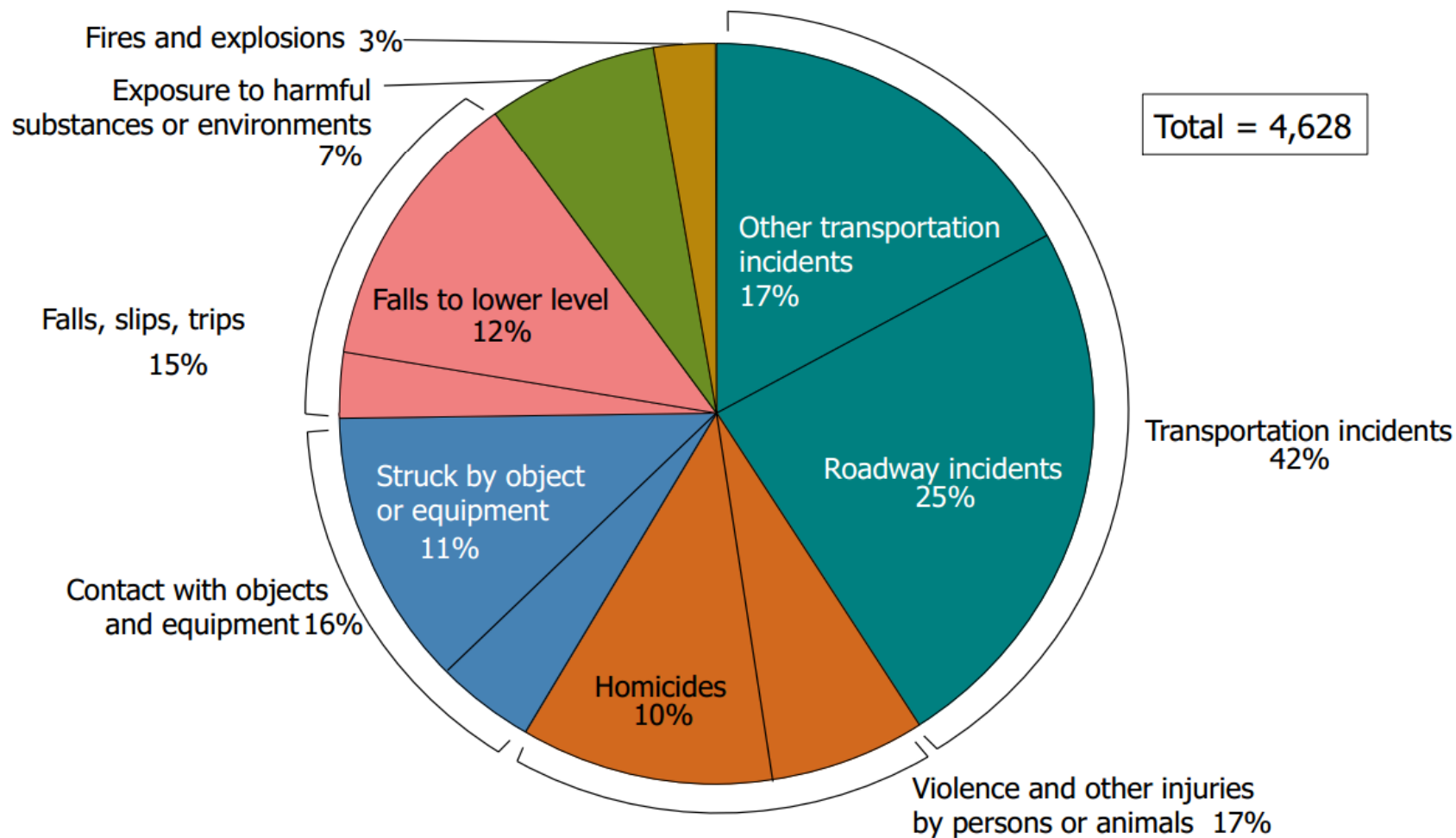
Comparison Fatality vs Non-Fatal

www.bls.gov



Fatalities are not decreasing at the same rate!

Fatal occupational injuries, by major event, 2012

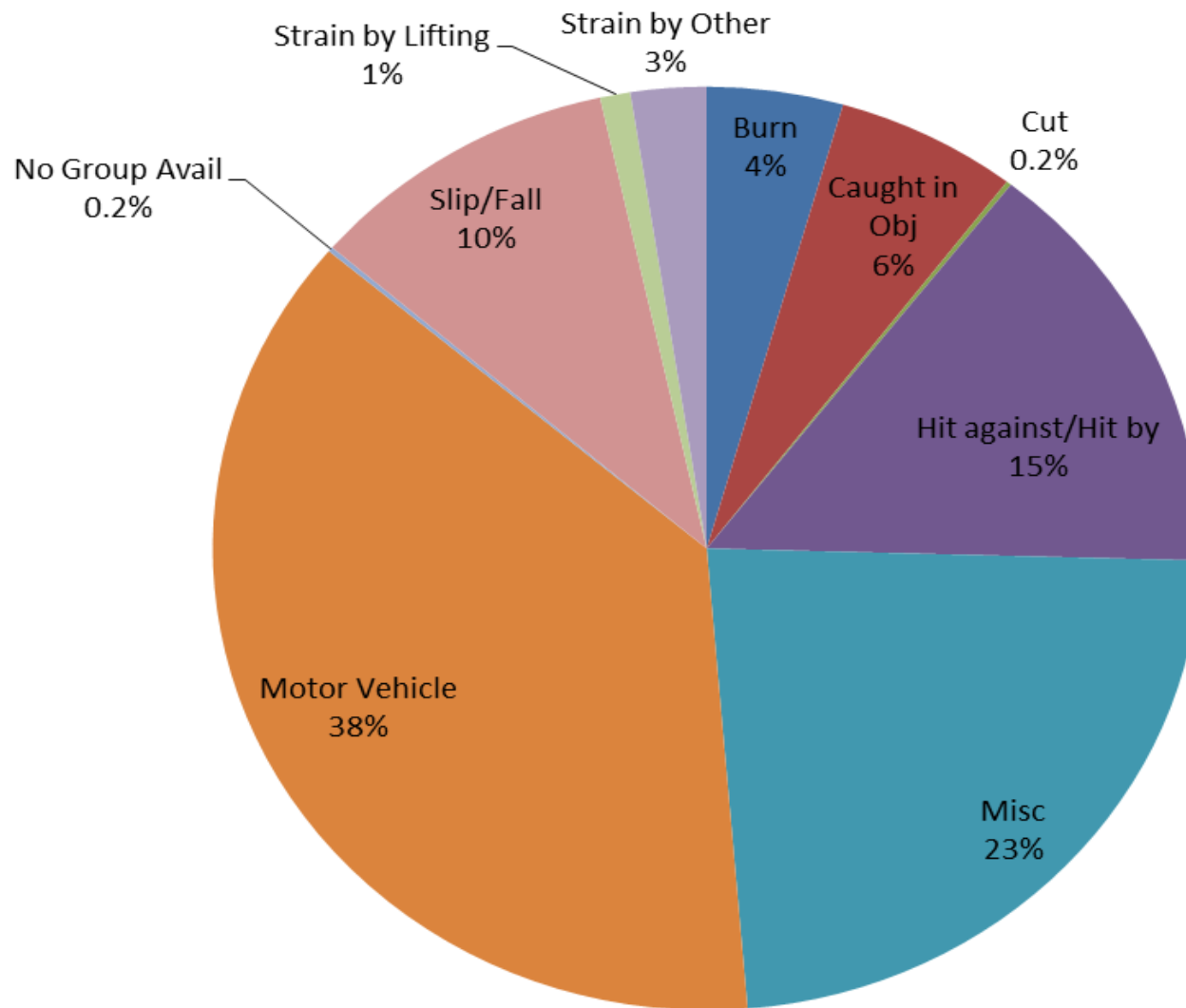


More fatal work injuries resulted from transportation incidents than from any other event in 2012. Roadway incidents alone accounted for one out of every four fatal work injuries.

Note: Reference year 2011 constitutes a series break from earlier years for event data. For more information, see http://www.bls.gov/iif/osh_notice11.htm. Percentages may not add to 100 due to rounding.

Source: U.S. Bureau of Labor Statistics. U.S. Department of Labor. 2014.

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.



Traditional Safety Efforts and Prevention of Severe Injuries/Fatalities

- Traditional safety efforts have significantly reduced the frequency of workplace injuries.
- 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.

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

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

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

A Shift in Safety Management Theory



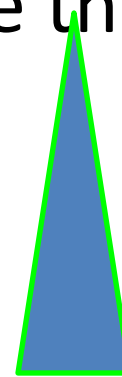
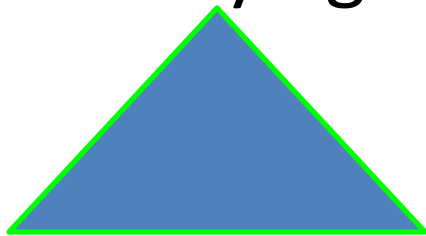
Herbert William Heinrich



The Heinrich 300-29-1 Model

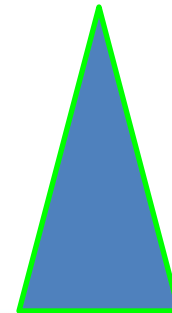
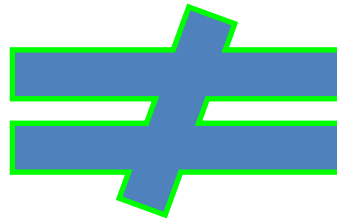
A Shift in Safety Management Theory

- 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

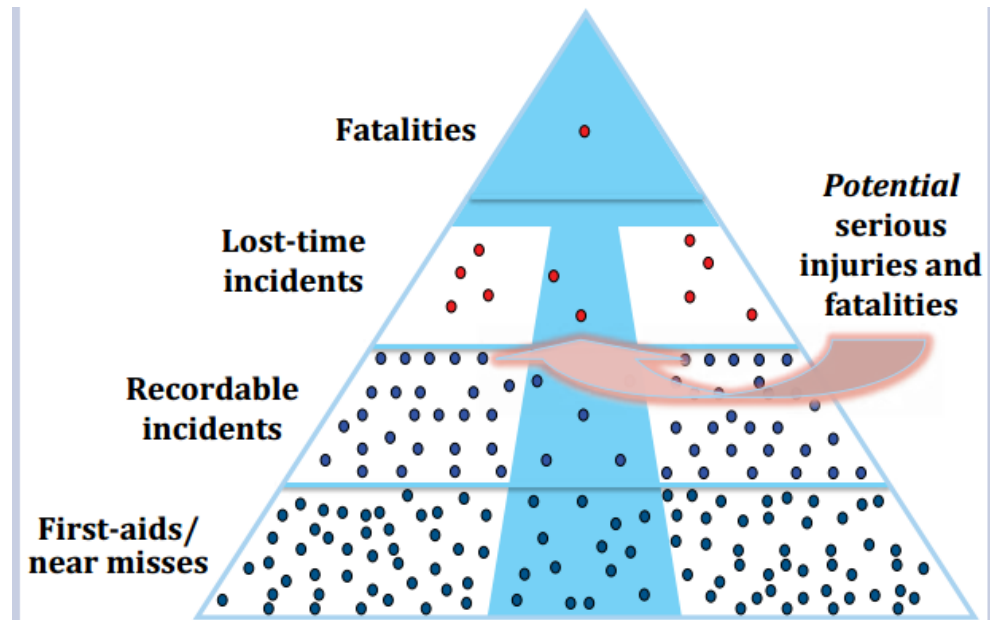
- Reducing the frequency rate of minor injuries will lead to corresponding reduction of major injuries
- You must work at the base of the “Triangle” to prevent injuries
- Unsafe acts and unsafe conditions were at the root of all injuries



New Understanding of Serious Injuries and Fatalities

- New insights that are disturbing to leading organizations:

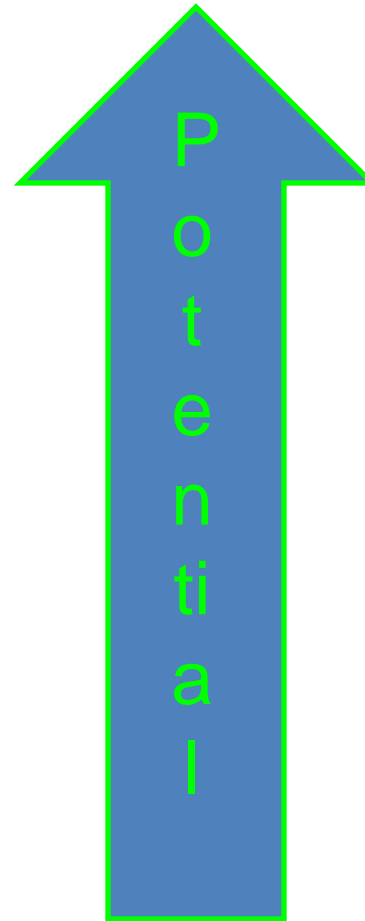
- 1) Not effectively reducing devastating injuries.
- 2) New data is in contradiction with Heinrich's Safety Model



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

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



A Shift in Safety Management Theory

- The underlying causes and correlates for more serious injuries are different from those underlying less serious injuries.
- Serious injuries and fatalities are most frequently associated with basic safety systems.



A Shift in Safety Management Theory

- 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.

100% Compliance

- High risk activities should be identified
- Specific policies/procedures addressing severe injuries/fatalities should be developed
- Employees should be trained on/sign off on procedures/policies
- 100% compliance should be required

Why are employees unsafe?

Unsafe behavior is often rewarding

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



Thereifixedit.com

Establish a Culture Where

- Management and supervisors are committed to safety.
- Employees are encouraged to report dangerous work practices and near misses.
- Immediate action taken to implement safe procedures.
- Employees know to follow safe procedures 100% of the time.

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



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.

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)

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

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 2013, 37 Utahans were killed in work related fatalities and WCF insured 20 of them
- **“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”