



FPST 3013 Safety Management

The History of Safety Management

Feb-22

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What is Safety?



- Webster's
 - the condition of being safe from undergoing or causing hurt, injury, or loss
- What is safe?
 - free from harm or risk
- How do we know when we are "safe"?
 - A feeling

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Before we can think about the future,
we must understand the past...

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- 1792 – 1750 BCE
- The Code of Hammurabi



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Egyptian Civilization



1250 BCE

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Greek Philosophers



- Hippocrates
 - 460-377 BCE



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The Roman Empire



- Pliny the Elder
 - 23-70 AD/CE



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The Renaissance



Phillipus Aureolus
1567



Georgius Agricola
1556



Bernardino
Ramazzini
1700

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The Industrial Revolution



- The Spinning Jenny in 1764
 - Credited with moving the textile industry from homes to factories
- The power loom in 1784
 - Improve the speed and quality of weaving
- The cotton gin in 1792
 - Easily separates cotton fibers from their seeds
- Replace animal power with mechanical energy (e.g. steam)
- Replace humans with machines
- These changes created hazards that were never before encountered

[The Industrial Revolution](#)

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Industrial Revolution



- 1836: Samuel F. B. Morse invents the telegraph
- 1840: Samuel Cunard begins transatlantic steamship service
- 1859: The first commercial oil well is drilled in Pennsylvania
- 1866: Cyrus Field lays the first successful transatlantic cable
- 1876: Alexander Graham Bell invents the telephone
- 1892: Rudolf Diesel patents the diesel engine
- 1899: Guglielmo Marconi invents long distance radio transmission
- 1903: The Wright Brothers make the first successful airplane flight
- Copyright 1996-1999 by David W. Koeller. dkoeller@northpark.edu

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History of U.S. Safety and Health



- Last half of the 19th century:
 - 1,750,178 working children between the ages of 10-15
 - 12-14 hours a day
- No safety and health guidelines

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Philosophy of the Day before safety laws...



- Came from English Common Law –
- Fellow servant rule
 - The employer was not liable for injury to an employee that resulted from the negligence of a fellow employee
- Contributory negligence
 - The employer was not liable if the employee was injured because of his or her own negligence
- Assumption of risk
 - The employer was not liable because the employee took the job with full knowledge of the risks and hazards involved

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Rational Arguments for Safety



- Humanitarian Argument
 - Accidents represent pain, suffering, & loss to workers, families, the community
 - Is it morally wrong to hurt employees?
- Financial
 - Safety costs money, but no safety costs more
 - Good Safety is Good Business
- Legal
 - Compliance with regulation
 - Liability and litigation
 - Willful disregard for safety can be a criminal offense

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MILESTONES IN THE SAFETY MOVEMENT



- 1812 - Embargo of War of 1812 spurred development of New England textile industry and the founding of Factory Mutual Insurance Company
- 1833 - The factory act (child labor)
- 1864 - North America's first accident insurance policy was issued
- 1867 - Factory inspection began in Massachusetts
- 1868 - the first barrier safeguard was patented (machine guarding)
- 1869 - the Pennsylvania legislature passed a mine safety law requiring two exits from all mines.
- 1869 - The Bureau of Labor Statistics (BLS) was started
- 1878 - First recorded call by a labor organization for federal occupational safety and health law
- 1877 - Massachusetts legislature passed a law requiring safeguards for hazardous machinery
- 1877 - passage of the Employer's Liability Law establishing potential for employer liability in workplace accidents
- 1896 - National Fire Protection Association is founded (NFPA)

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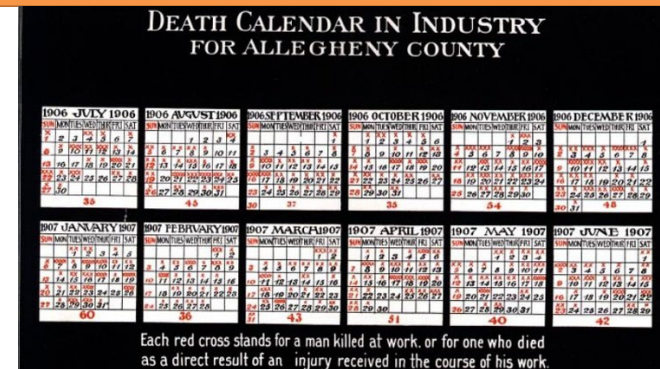


Changes in Philosophy came about because
of...

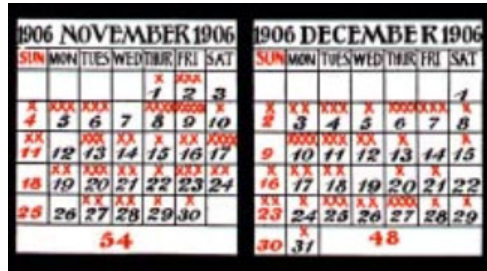
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Pittsburg Survey in 1906 "Death Calendar"



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Teddy Roosevelt



- 1908
- "The number of wage-earner accidents is appalling"
 - First WC law
 - only covered federal employees



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First WC Bill



- Wainwright Law of 1910
 - Gave employee's property of the employer without due process of the law
 - Declared unconstitutional on March 25, 1911
 - What happened on this day?
 - The Triangle Shirt Waist fire
 - Declared constitutional mid-1914
 - Wainwright Law.docx
- 1916
 - US Supreme Court declares WC constitutional
 - New York Central Railroad Co. v. White
 - One man killed for each mile of track laid
 - Many states followed by implementing WC laws

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Insurance Companies



- Instrumental in the safety movement
 - Why?
 - Provided lower rates to safe companies
- What were the first two large-scale industries to have organized safety programs?

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More Milestones



- 1908 - US Steele instituted the first formal Workplace Safety Program
- 1911 - ASSE founded
- 1912 - NSC founded
 - First national survey revealed chaos in industrial safety
- 1913 – [US Department of Labor established](#)
- 1918 - ANSI founded
- 1930s – the Great Depression
- 1945 – WWII ended
- 1969 - Board of Certified Safety Professionals was established.
- 1970 - [OSHA created](#)
- 1999 – ANSI Z10 & OHSAS 18001 was 1st published
- 2016-17 – ISO 45001 in final draft stage

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Safety and the Law



- Walsh-Healy Act - 1936
 - Firms contracting with government must provide safe and healthful conditions
- Other Laws
 - Contract Work Hours and Safety Standards Act – 1969
 - Williams-Steiger Occupational Safety and Health Act - 1970 (OSH Act)

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International Standards



- Three key international regulatory guidelines
 - The European Framework Directive on Safety and Health at Work – 1989
 - Guaranteed minimum safety and health requirements throughout Europe
 - Member States allowed to maintain or establish more stringent measures
 - Worker health and safety
 - Hazard Identification
 - Hazard Prevention
 - Competent Safety Professionals
 - Emergency Response
 - First aid and facility evacuation

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International Standards



- International Organization for Standardization (ISO???)
 - 9000
 - Quality Management
 - 14000
 - Environmental Management
 - 45001
 - standard for management systems of occupational health and safety (OH&S), published in March 2018
 - They tell the what but not the how

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Emerging Trends



- Analyzing loss potential of an organization or activity
 - What is this?
 - Risk management
 - Predict loss...where, when, severity
 - Prevent occurrence
- True incident causal analysis
- More focus on product safety

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HAVE WE CHANGED THE PICTURE?

WRONG QUESTION



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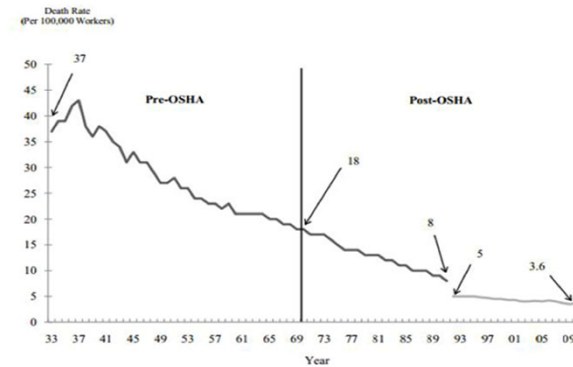


HAVE WE IMPROVED?

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FIGURE 1: WORKPLACE FATALITIES, 1933-2010

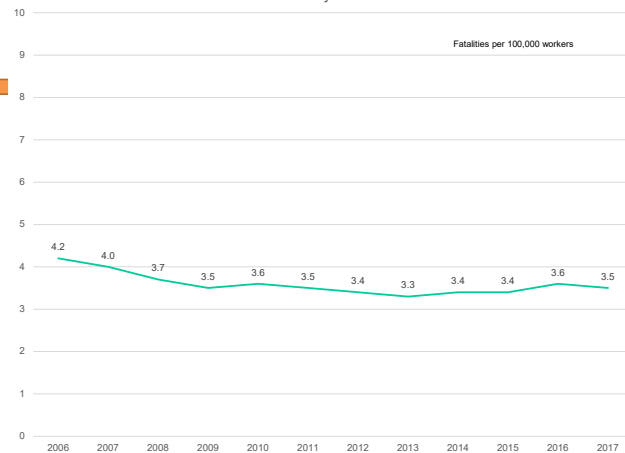


Sources: National Safety Council (1994) and US Department of Labor, Bureau of Labor Statistics (2012)

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Fatality Rate



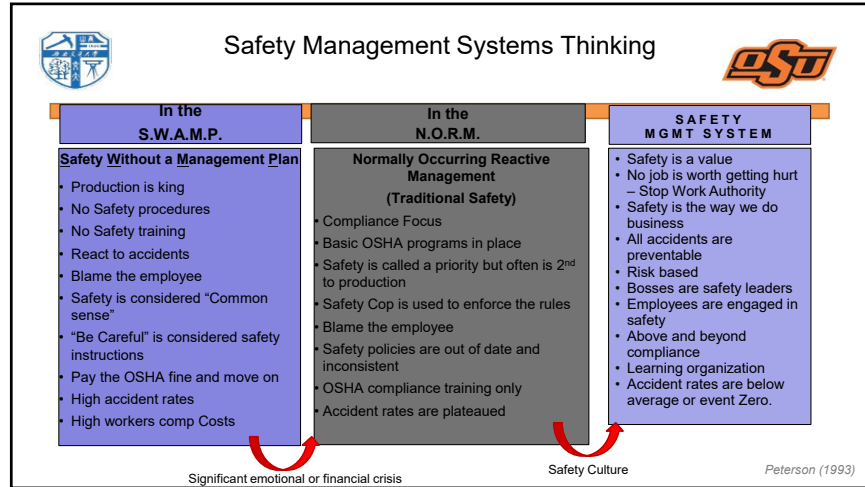
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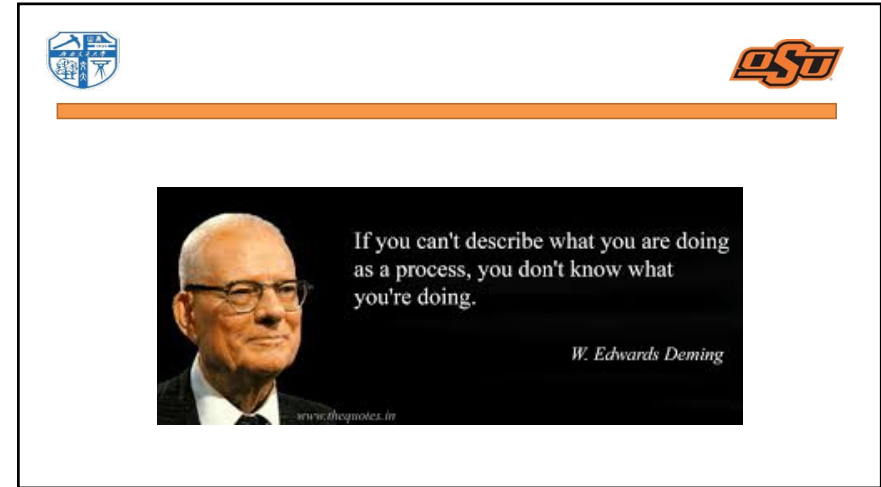
Improvement

- Between 1912 and 1999, death rate reduced 92%
- Incident Rate Trends
 - Lowest for smallest companies, <19 EE
 - Rise for medium sized, <250 EE
 - Decline for large, >250 EE
 - Lower for smaller companies...less exposure...but why higher for medium companies?
- Problem with the Data
 - Reporting used to be voluntary
 - All reporting is on the honor system
- Is there another explanation for the reduction in death rate instead of safety programs?
 - Growth in service industry
 - Reduction of high risk industry

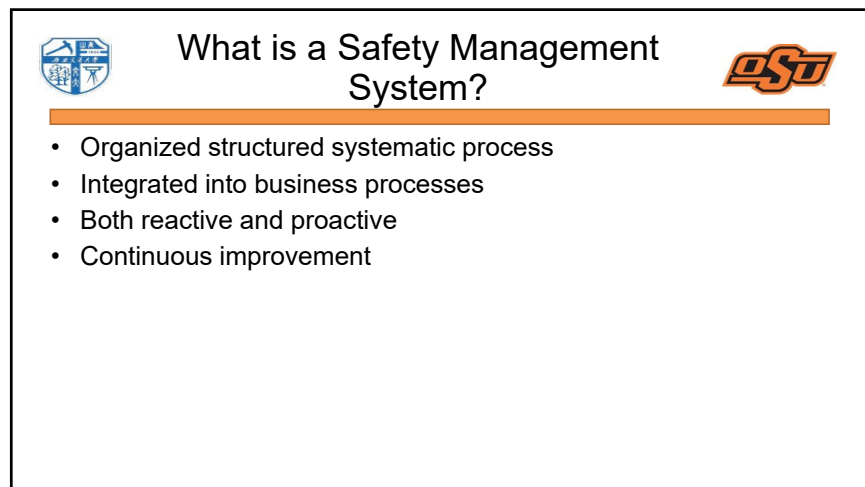
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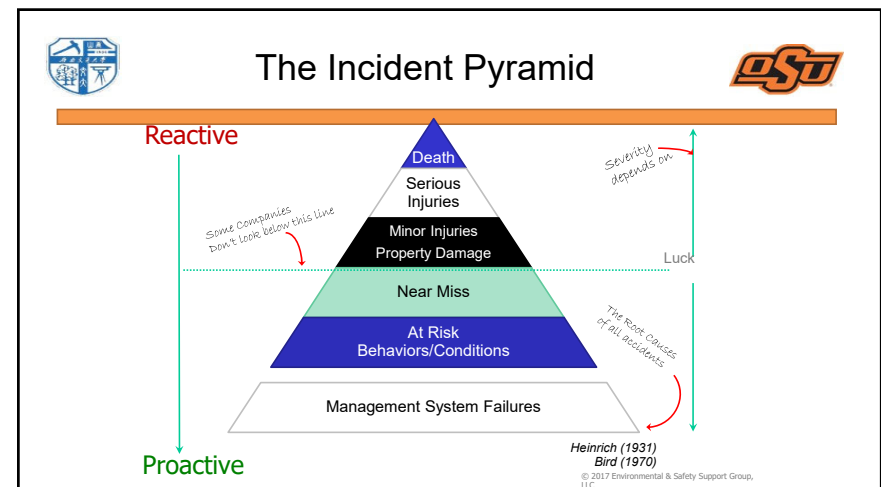
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What are the elements of a Safety Management System?



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Management Commitment and Employee Involvement



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Involved vs. Committed



Ham and Egg Breakfast Analogy



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Collaborative Bachelor's Degree Program of Fire Protection and Safety Engineering
Technology between Southwest Jiaotong University and Oklahoma State University, U.S.A.



**"EMPLOYEE ENGAGEMENT"
IS THE GOAL**

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Safety Professionals



- Specialized knowledge in physical and social sciences
 - Physical
 - Chemistry
 - Math
 - Statistics
 - Physics
 - Engineering
 - Social
 - Behavior
 - Motivation
 - Communication
 - Business theory
- Where do safety professionals spend the majority of their time?

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CURRENT ISSUES



- Technology and Public Interest
 - The internet = public knowledge
 - Not just of events, but of laws, best practices, new innovations
 - e.g. Web MD
- Political Problems
 - Main one?
 - Industry – Union – Government relations
 - No end in site

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FUTURE ISSUES



- You can't put a price on a life
 - Public knowledge will continue to increase
- Global Market = global Standardization
- Shift from manufacturing to service = reduced risks
- More diverse work force = cultural differences
- Developing countries and the information age
 - Safety expertise needed globally
- Criminal prosecution of employers
 - Facilities cannot hide any more

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