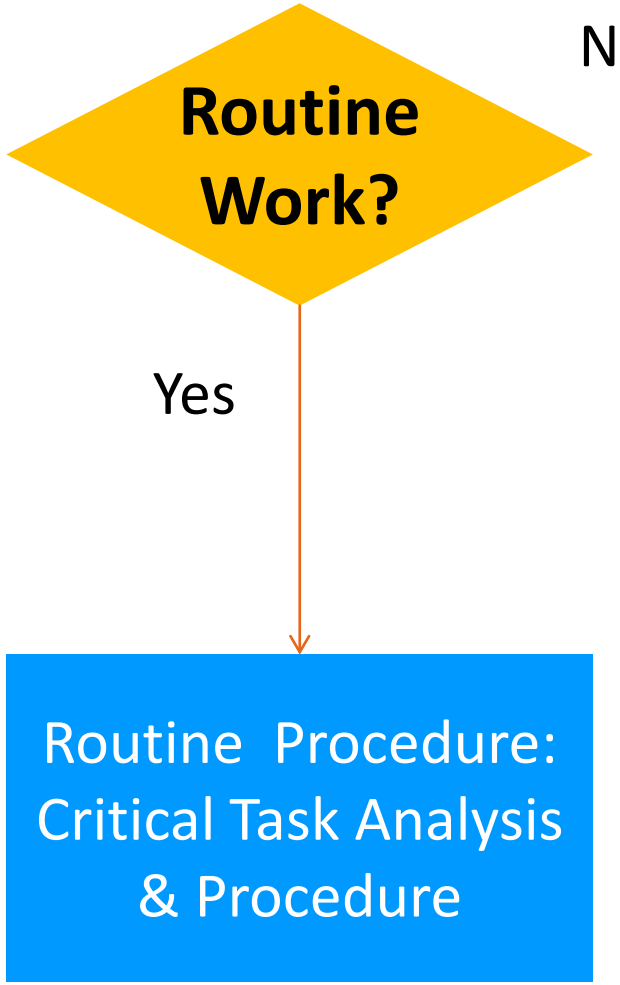
Pulp and Paper Safety Association

Major Injury Prevention

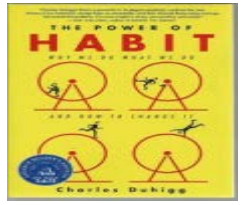
David W. Wilbanks, MPH, CSP, CRSP

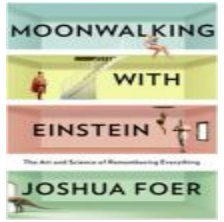


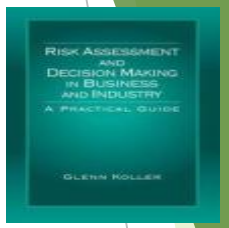
Preliminary Risk Analysis

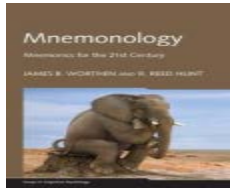
For all non-routine work, contractor or own internal personnel.

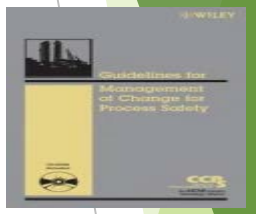
Supporting Concepts & Peer Reviewed Research

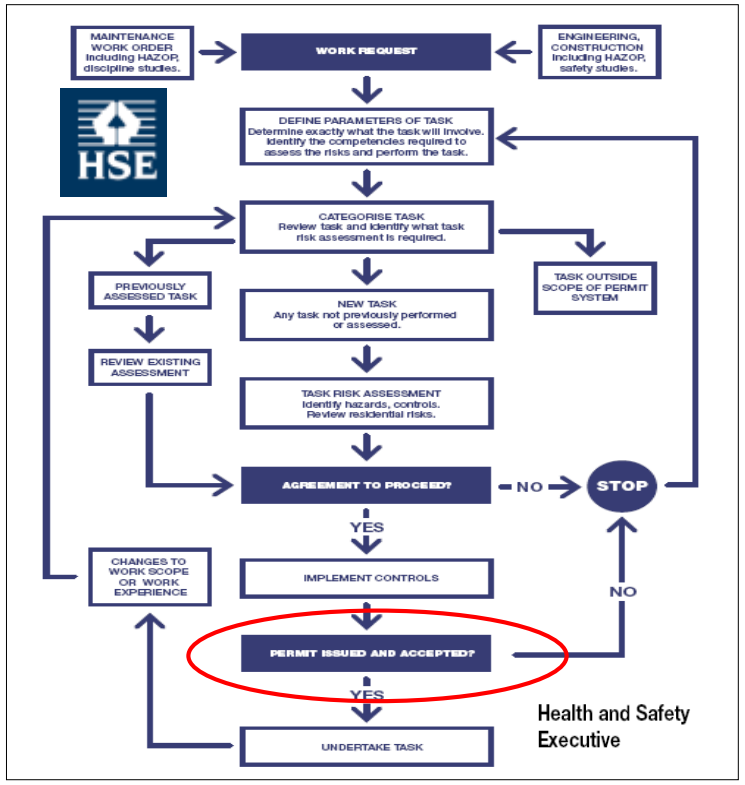








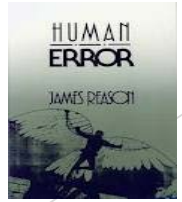




The magical number 7 +/-2: Some limits on our capacity for processing information

George A. Miller,

The Psychological Review, 1956



Preventing Major Injuries

Observations on Theory, Models & a Path Ahead

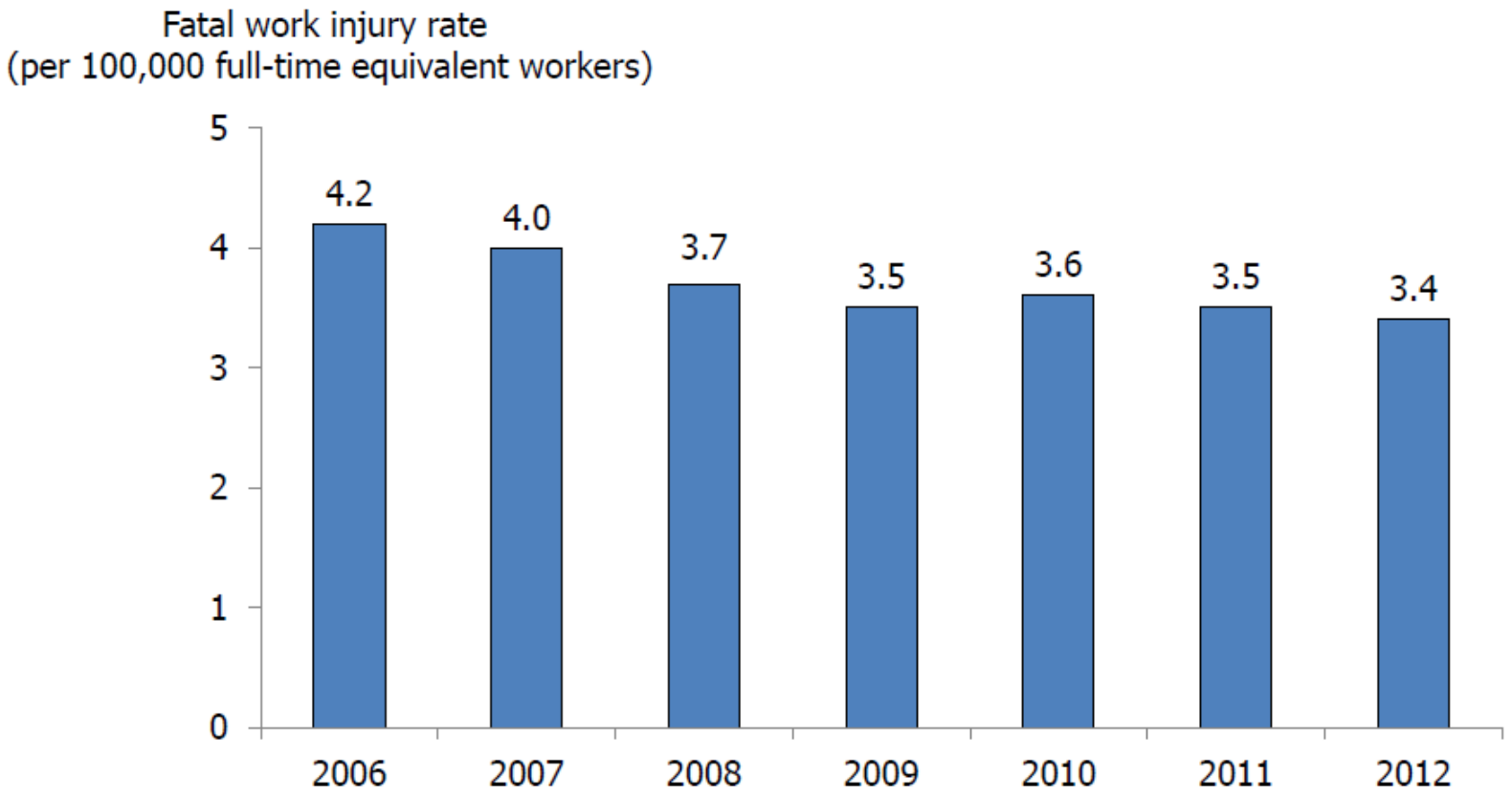
By David W. Wilbanks

Major injury events occur in every type of workplace, large and small, sophisticated or otherwise. Those performing maintenance (Reason, 1990), construction and installation services are especially at risk after consideration is

•Virginia: Worker died from head injuries after being struck by an excavator arm while trimming trees.

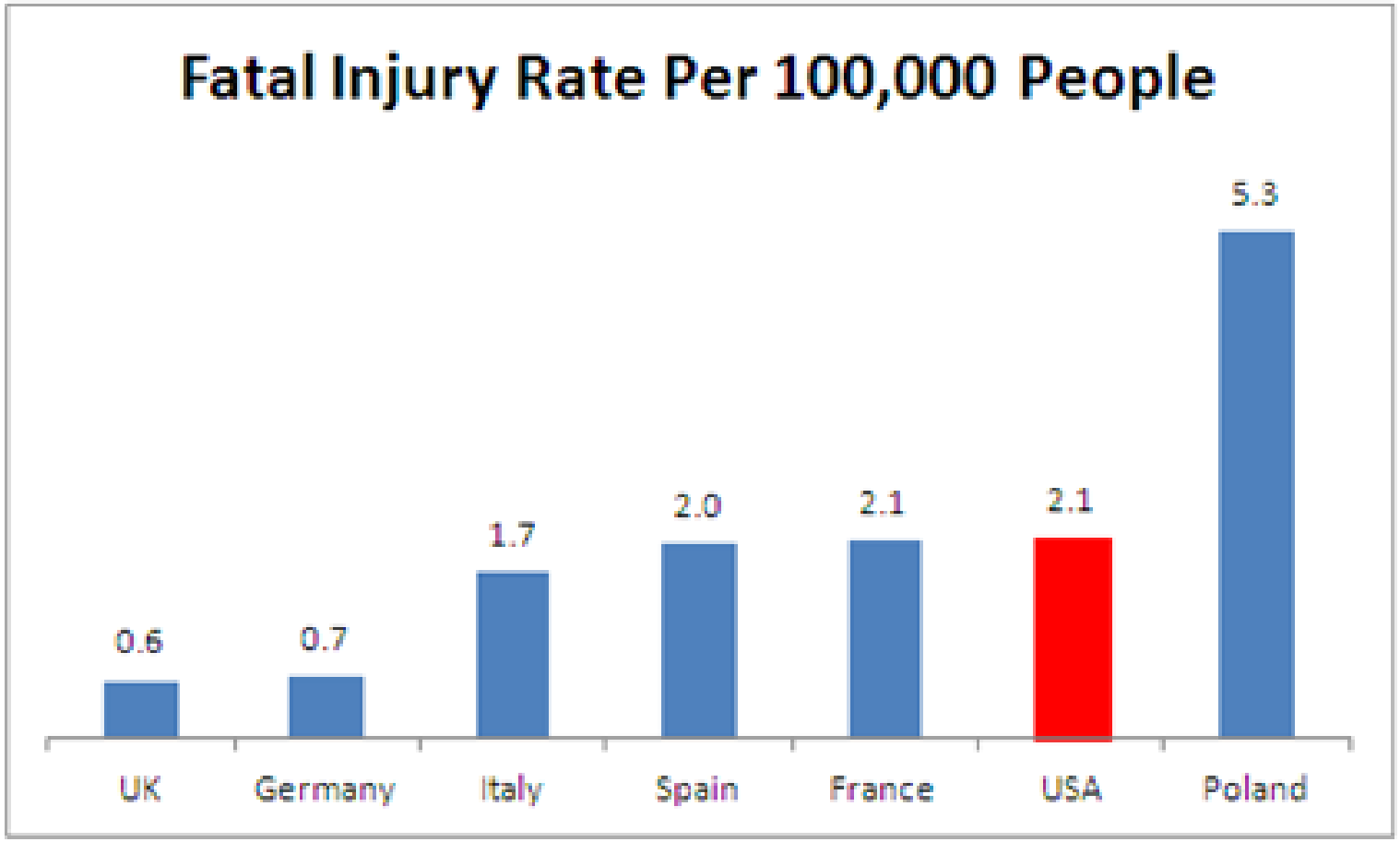
•Michigan: Worker installing insulation killed after falling 25 ft from roof.

Rate of fatal work injuries, 2006–2012



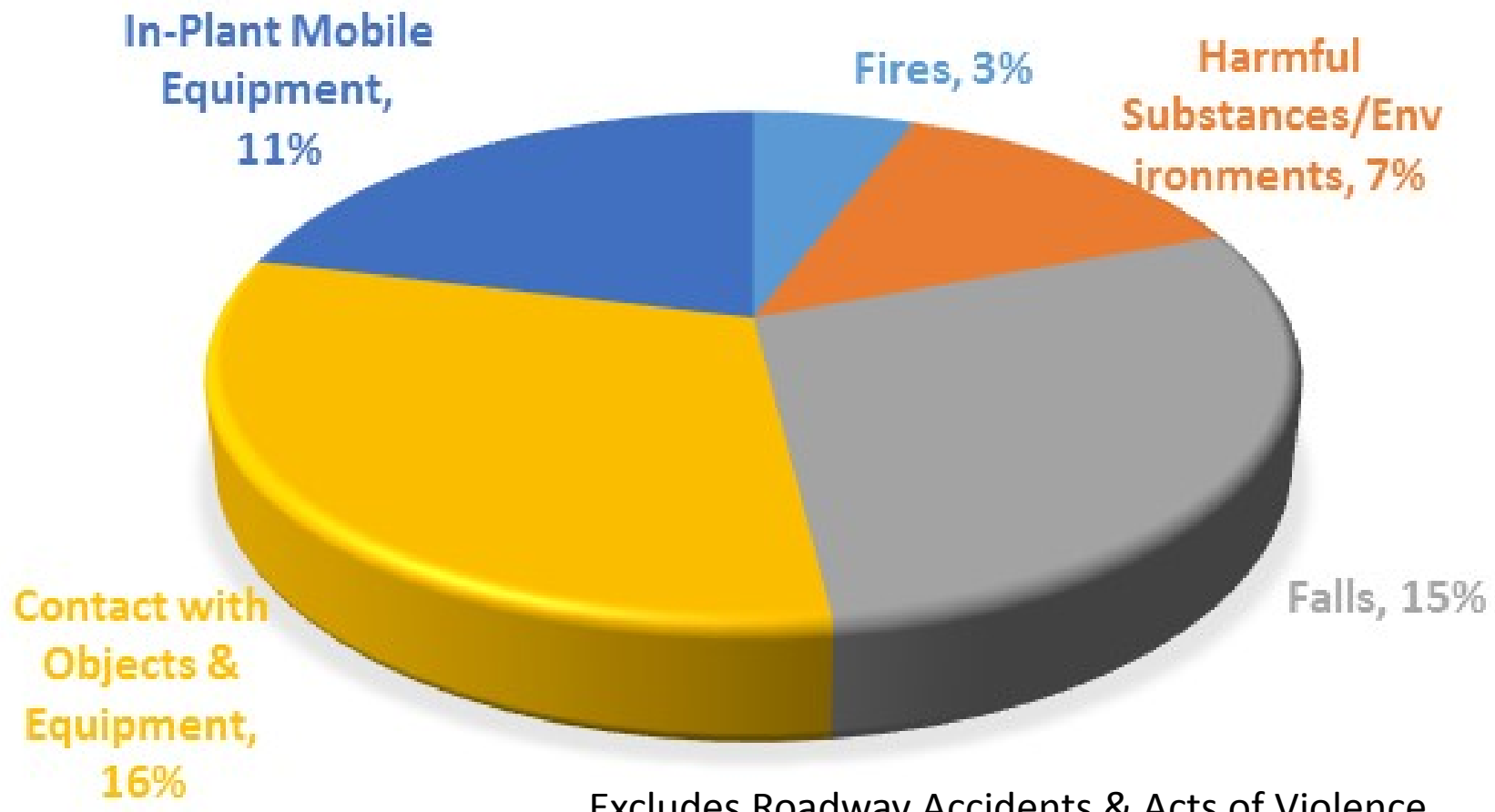
The rate of fatal work injuries in 2012 was 3.4 fatal work injuries per 100,000 full-time equivalent workers, down slightly from 3.5 in 2011.

Note: Rate = (Fatal work injuries/Total hours worked by all workers) x 200,000,000 where 200,000,000 = base for 100,000 full-time equivalent workers (FTEs) working 40 hours per week, 50 weeks per year. The total hours worked figures are annual average estimates of total at work multiplied by average hours for civilians, 16 years of age and older, from the Current Population Survey (CPS).
In 2008, CFOI implemented a new methodology, using hours worked for fatal work injury rate calculations rather than employment. For additional information on the fatal work injury rate methodology, please see http://www.bls.gov/iif/oshnotice10.htm.
Source: U.S. Bureau of Labor Statistics, U.S. Department of Labor, Current Population Survey, Census of Fatal Occupational Injuries, and U.S. Census Bureau, 2014.



Consolidated from "Census of Fatal Occupational Injuries," Bureau of Labor Statistics, 2013, and "Statistics on Fatal Injuries in the Workplace 2011/12," by Health and Safety Executive, 2013.

2012 BLS STATISTICS



Excludes Roadway Accidents & Acts of Violence
Population of 2,407 “in-plant/work site” events

UNITED STATES DEPARTMENT OF LABOR

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Highlights

Young workers have rights

Web page | "I have rights" poster

Preventing Heat Illness in Outdoor Workers

Get the Heat App! En español

Protecting Temporary Workers

OSHA & State Plan Offices

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- Offices
- On-Site Consultation (Free)
- OSHA Poster
- OSHA's 40 Years

Latest News

- OSHA issues hazard bulletin to safeguard tree care workers [6/16/14]
- New OSHA resource aims to help reduce injuries among workers in the nursing home and residential care industries [6/11/14]
- OSHA announces new interactive training webtool on identifying workplace hazards [6/10/14]
- OSHA schedules stakeholder meeting to consider proposed standard to protect safety, health of emergency responders [6/4/14]
- More than 1M workers expected to participate in National Fall Safety Stand-Down [6/2/14] [En Español]
- $7M for Susan Harwood safety and health training grants now available from US Labor Department's OSHA [5/14/14]
- OSHA announces that the final rule revising standards for electric power generation, transmission and distribution has been published in the Federal Register [4/11/14]

More News

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Worker Fatalities

workers killed when a wireless communications tower 3/27/2014 Georgia: Work sweep auger.

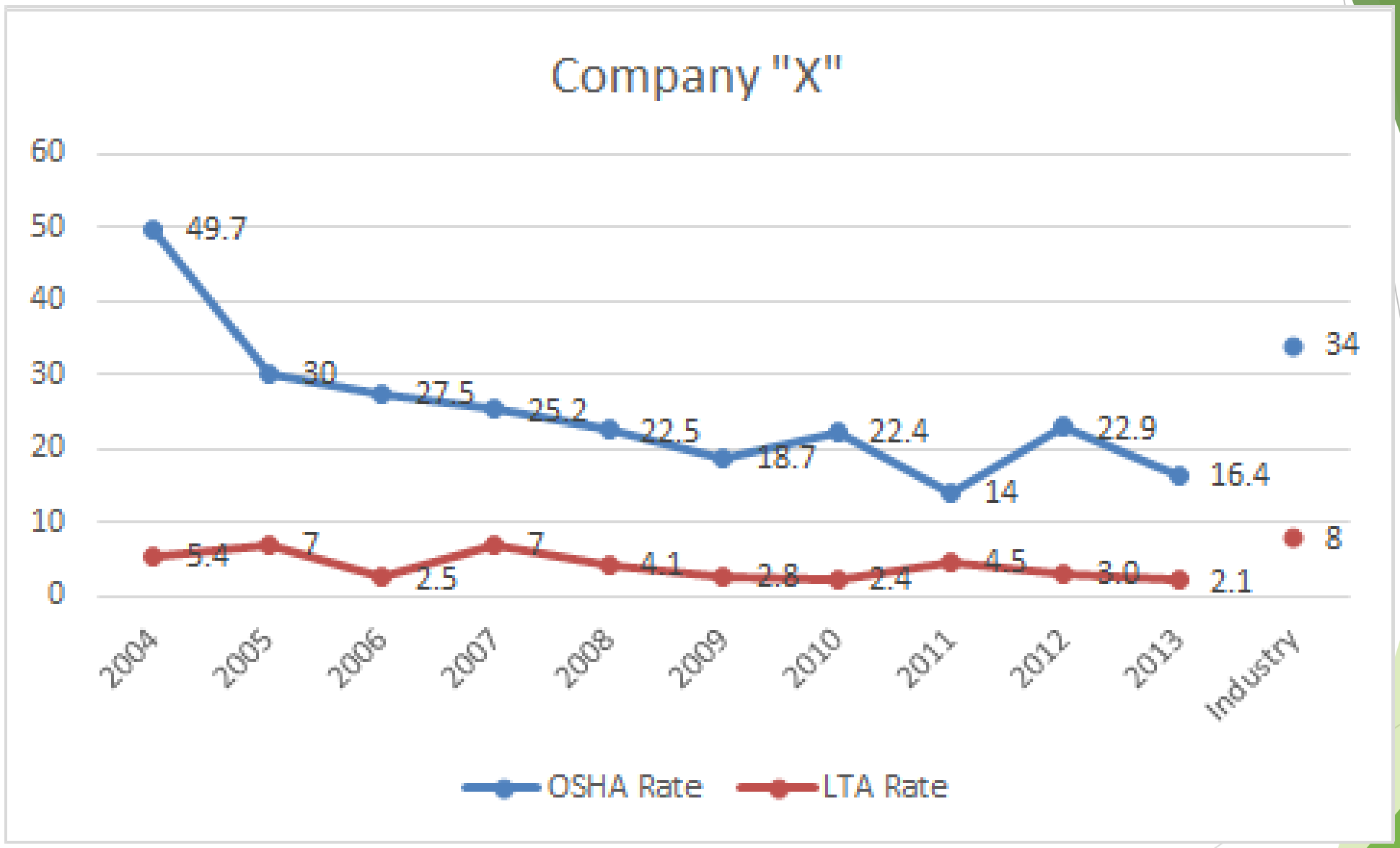
4,628 workers died on the job in 2012*

OSHA.gov Work Fatalities

- 3/2/14 Ohio: Worker killed in maintenance shop fire.
- 3/3/14 Colorado: Worker died from exposure to oil tank fumes.
- 3/5/14 Michigan: Worker inspecting parts crushed when injection molding machine activated.
- 3/8/2014 Iowa: Worker killed in fall from frost covered roof.
- 3/12/2014 Kentucky: Worker was caught and killed in a press while trying to retrieve a hammer.
- 3/12/2014 Arkansas: Temporary worker killed in fall from rooftop.
- 3/13/2014 New York: Worker died from carbon monoxide poisoning.
- 3/25/2014 Kansas: Two workers killed when a wireless communications tower collapsed.
- 3/27/2014 Georgia: Worker died in a grain storage silo after becoming entrapped by sweep auger.
- 4/2/2014 Texas: Worker electrocuted when bucket contacted energized powerline.
- 4/6/2014 New York: Worker died from carbon monoxide poisoning.
- 5/17/2014 Wisconsin: Worker struck and killed by a falling tree.

1. Major Injury Accidents Still Occur

The hazards are known and controllable



?

Numbers From SMA through May 2012

Steel Industry Fatalities

CRITICAL RISK PROJECT

Lock out/ Tag out

Working at Heights

Confined Spaces

Overhead Cranes

Critical Guidelines

Safety Pathways

Mobile Equipment

Molten Steel Path

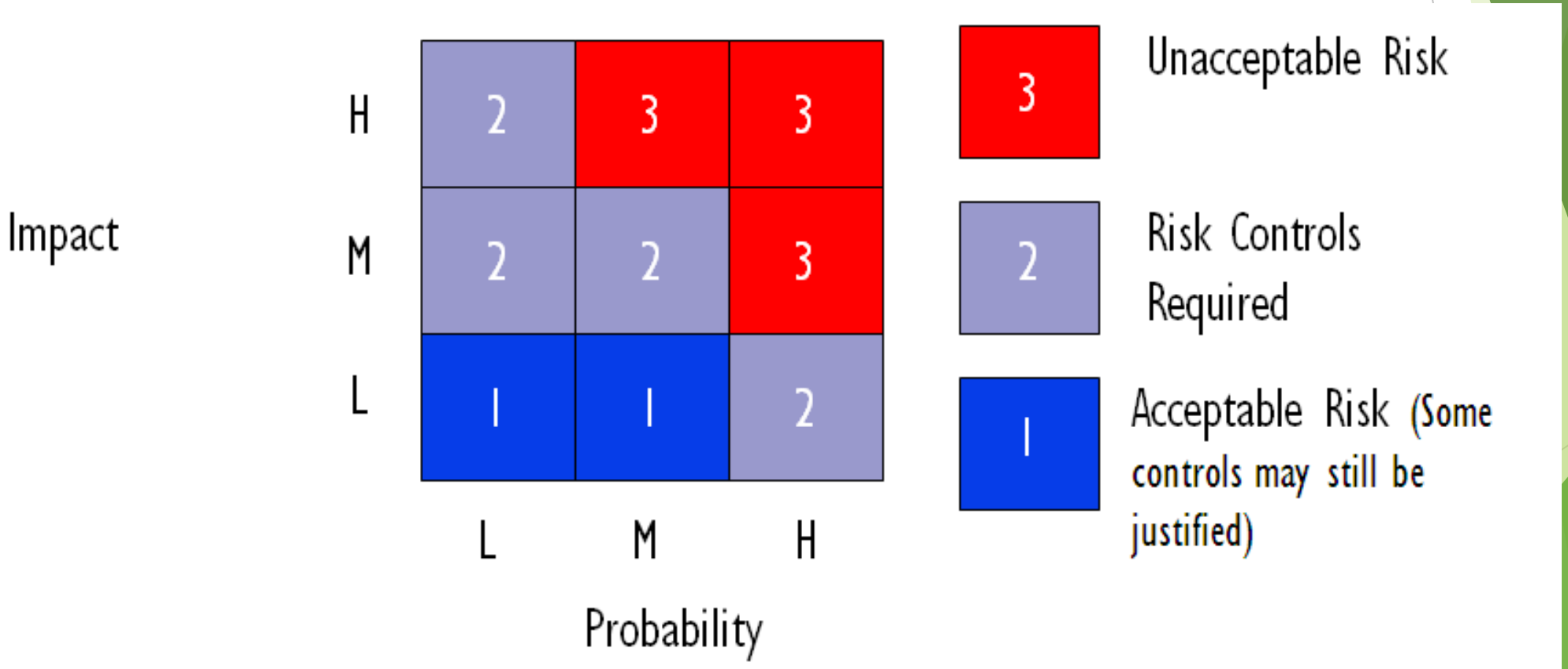
Rail

GERDAU

Critical Risk Standards Conformance. KPI requires minimum 85% overall avg & no standard < 80%,

Critical Risk Process Flow	2014 Target	Dog Status	Bright Bar	CP	North	South	West	Rail	Wire
Pedestrian Path	90.0%	92.5%	88%	95%	96%	93%	85%	98%	94%
Mobile Equipment	85.0%	83.2%	82%	83%	85%	85%	78%	86%	87%
Lockout/Tryout	95.0%	96.8%	98%	96%	98%	97%	96%	98%	98%
Confined Space	95.0%	95.7%	96%	95%	96%	98%	100%	93%	96%
Overhead Crane	82.0%	82.1%	82%	83%	83%	82%	79%	83%	86%
Rail	90.0%	92.0%	na	na	91%	91%	97%	91%	na
Working At Heights	86.0%	87.7%	92%	87%	89%	87%	86%	89%	89%
Overall Score	89.0%	89.0%	90%	89%	91%	89%	86%	91%	91%

We need to talk more about *Risk*, and less about *pyramids*



1. Major Injury Accidents Still Occur

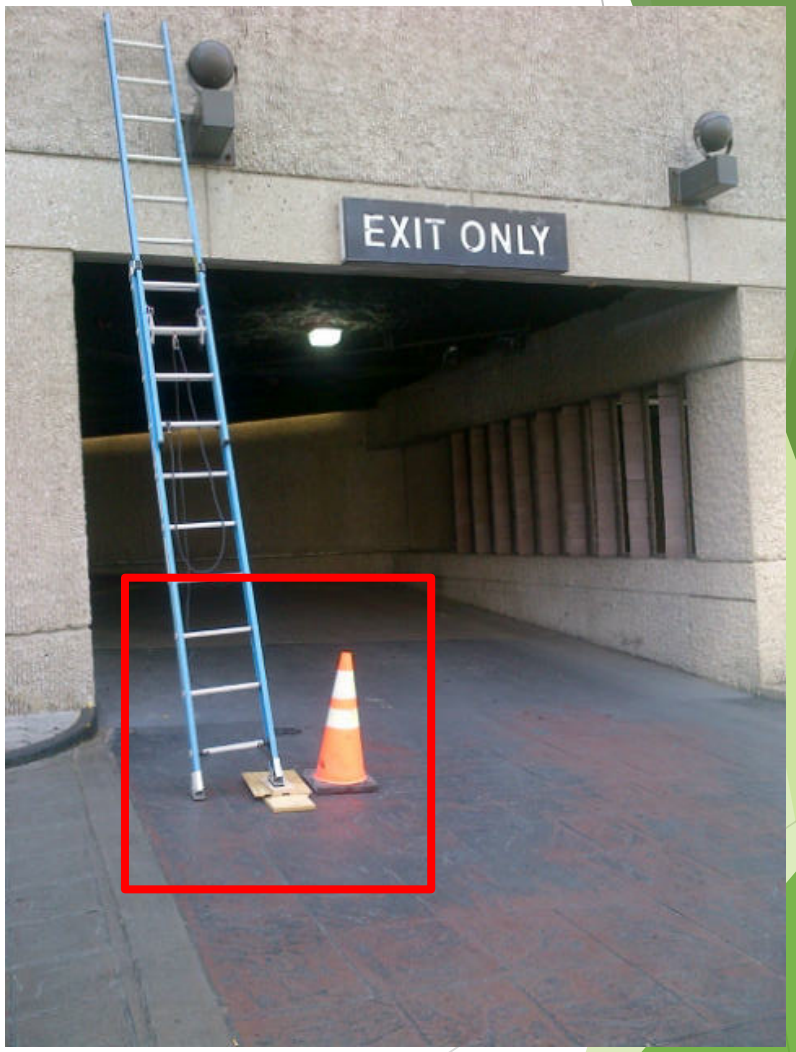
The hazards are known and controllable

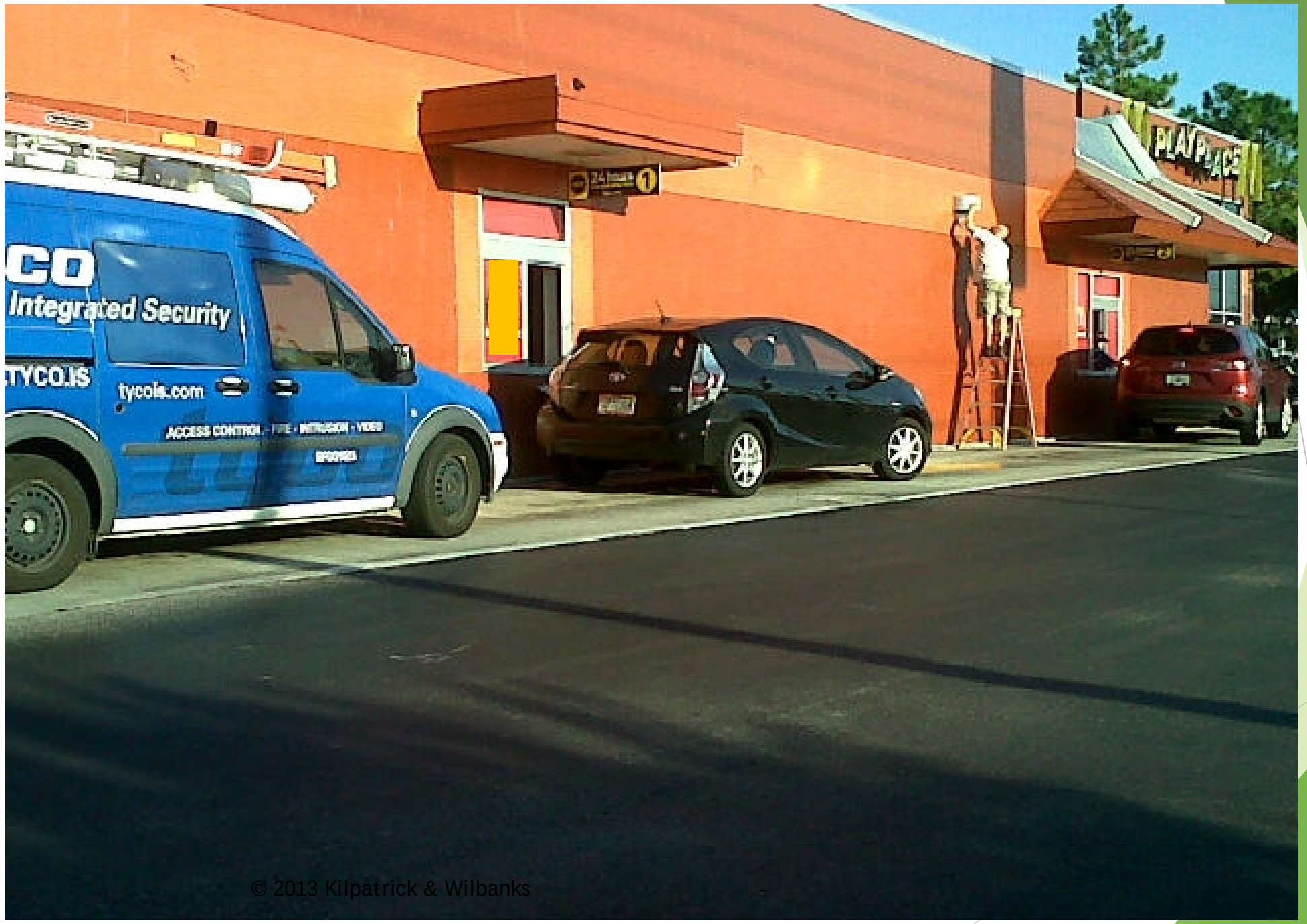
2. All Hazards ARE NOT Equal!

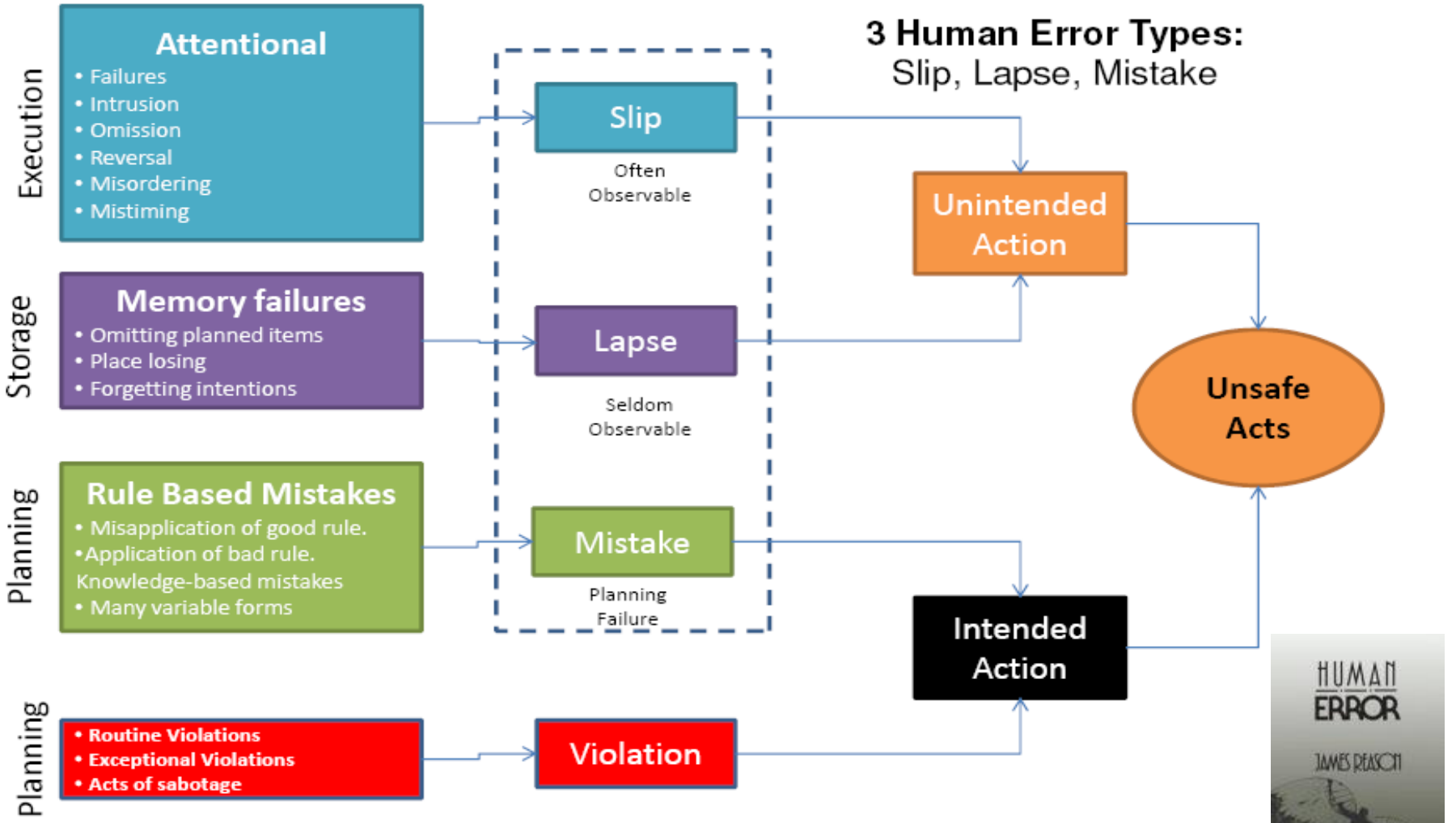
We need a *way* to identify major injury hazards

Opinion……

- Conclusions to major injury events often assume workers had adequate understanding and means to control hazards.
  - Frequently Not True.



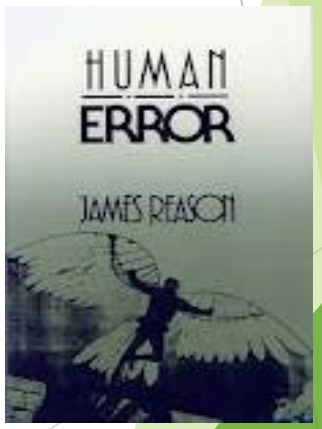




James Reason, 2000

One of the most common accident scenarios involves the deliberate disabling of engineered safety features by operators in pursuit of what, at the time, seems a perfectly sensible goal….

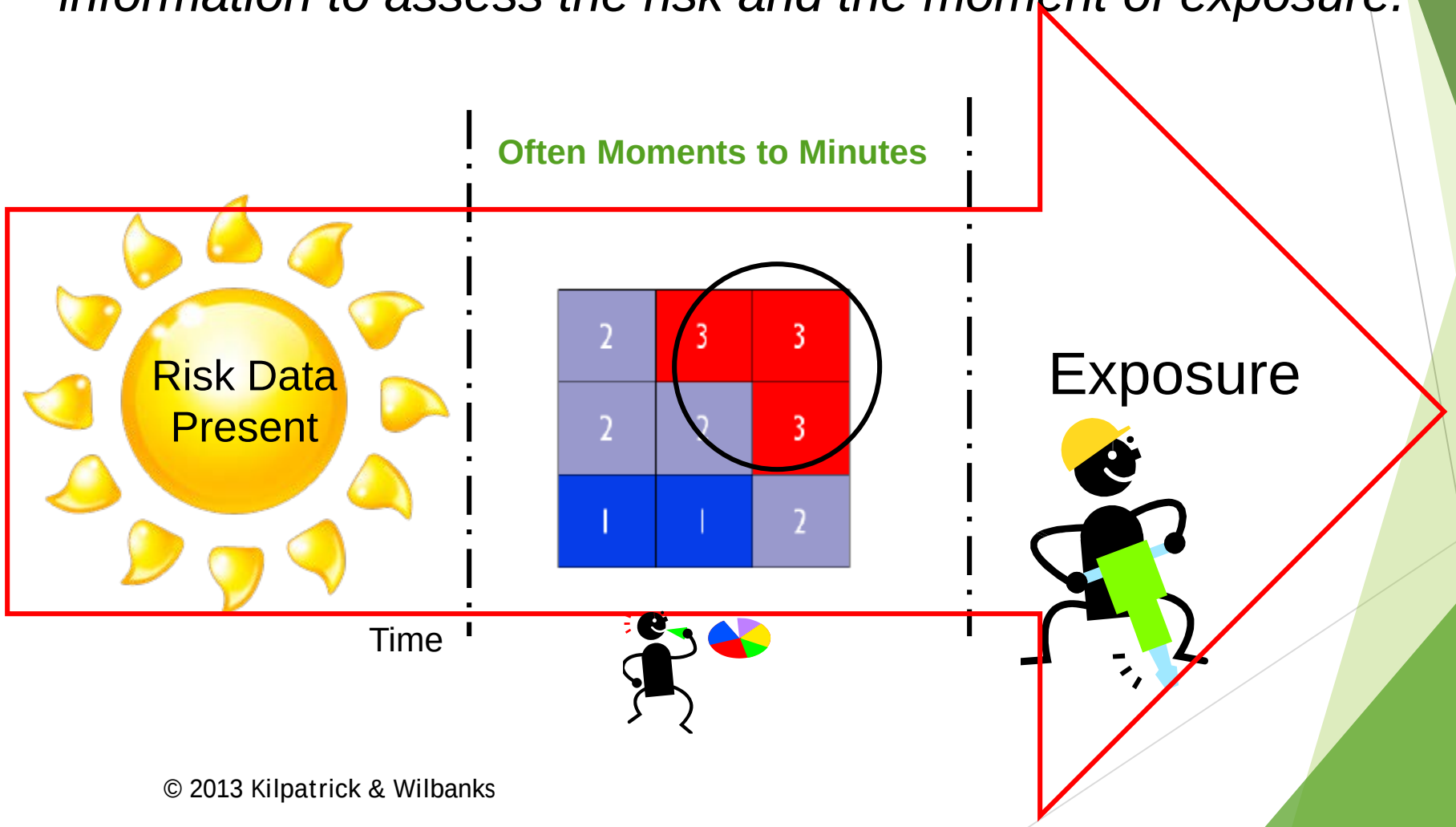
Another happens when the defenses are breached because the operators are unaware of (hazards) because they have an erroneous perception of the system state.
(Something has changed)

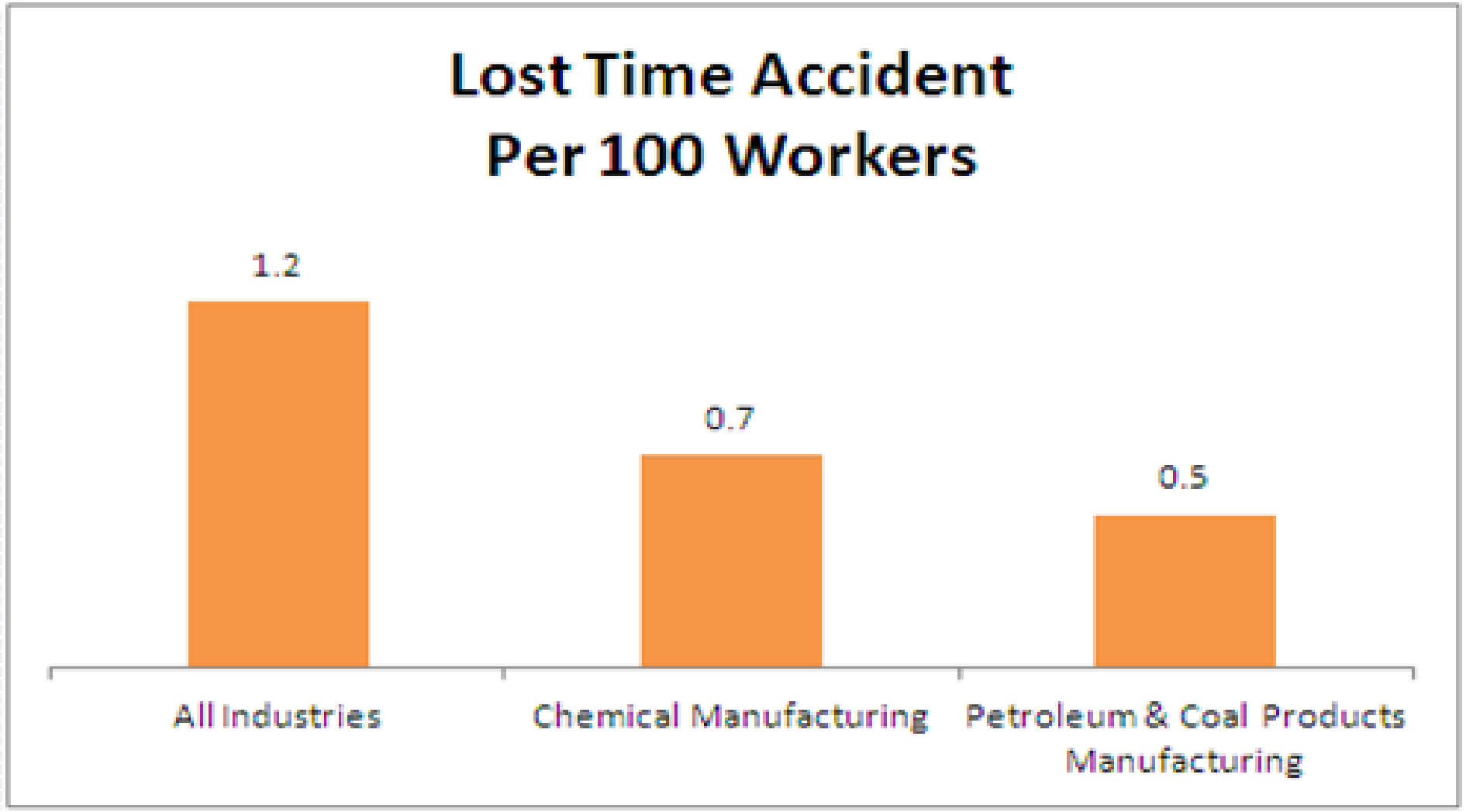


James Reason published in 2000

Hitting the *SWEET* spot

The moment between (the worker) having enough information to assess the risk and the moment of exposure.

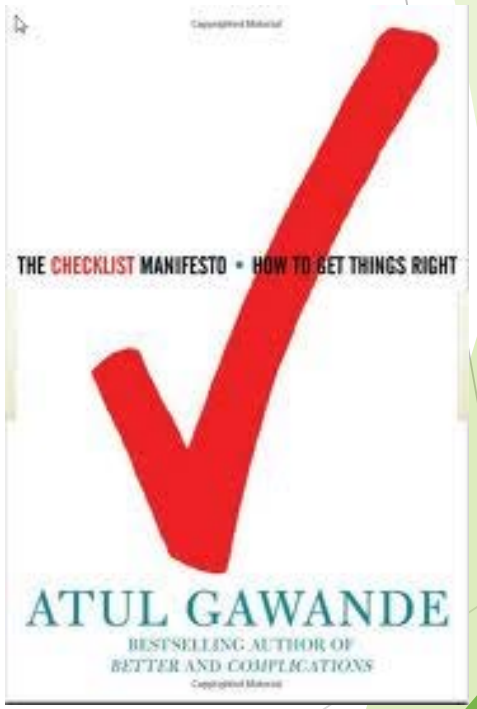




Adapted from "Incidence Rates of Non Fatal Occupational Injuries and Illnesses by Case Type and Ownership, Selected Industries," by *Bureau of Labor Statistics*, 2010, Table 1. *Workplace Injuries and Illness*. 2012.

Learning……

January 15, 2009



The Checklist Manifesto

Traffic

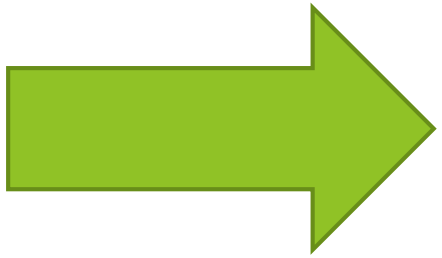
Equipment

Energy

C^{3}hemicals,

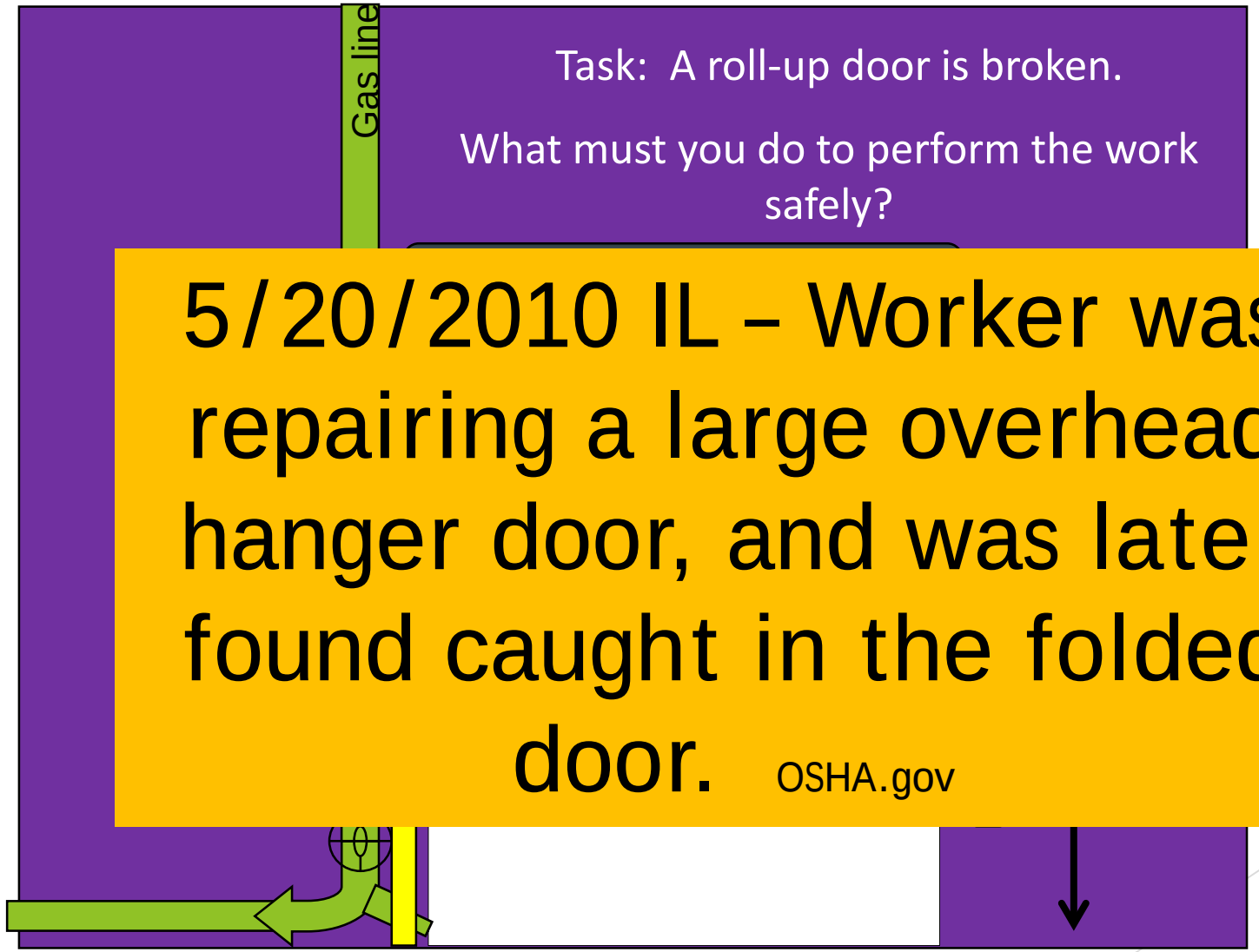
confined spaces, combustion

Heights



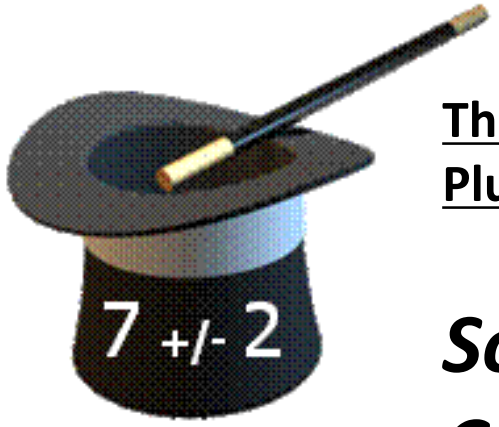
Electrical
Pneumatic
Hydraulic
Gravity
Solids
Liquids
Gases
Springs (kinetic)

Roll-Up Door - Repair



5/20/2010 IL – Worker was repairing a large overhead hanger door, and was later found caught in the folded door. OSHA.gov

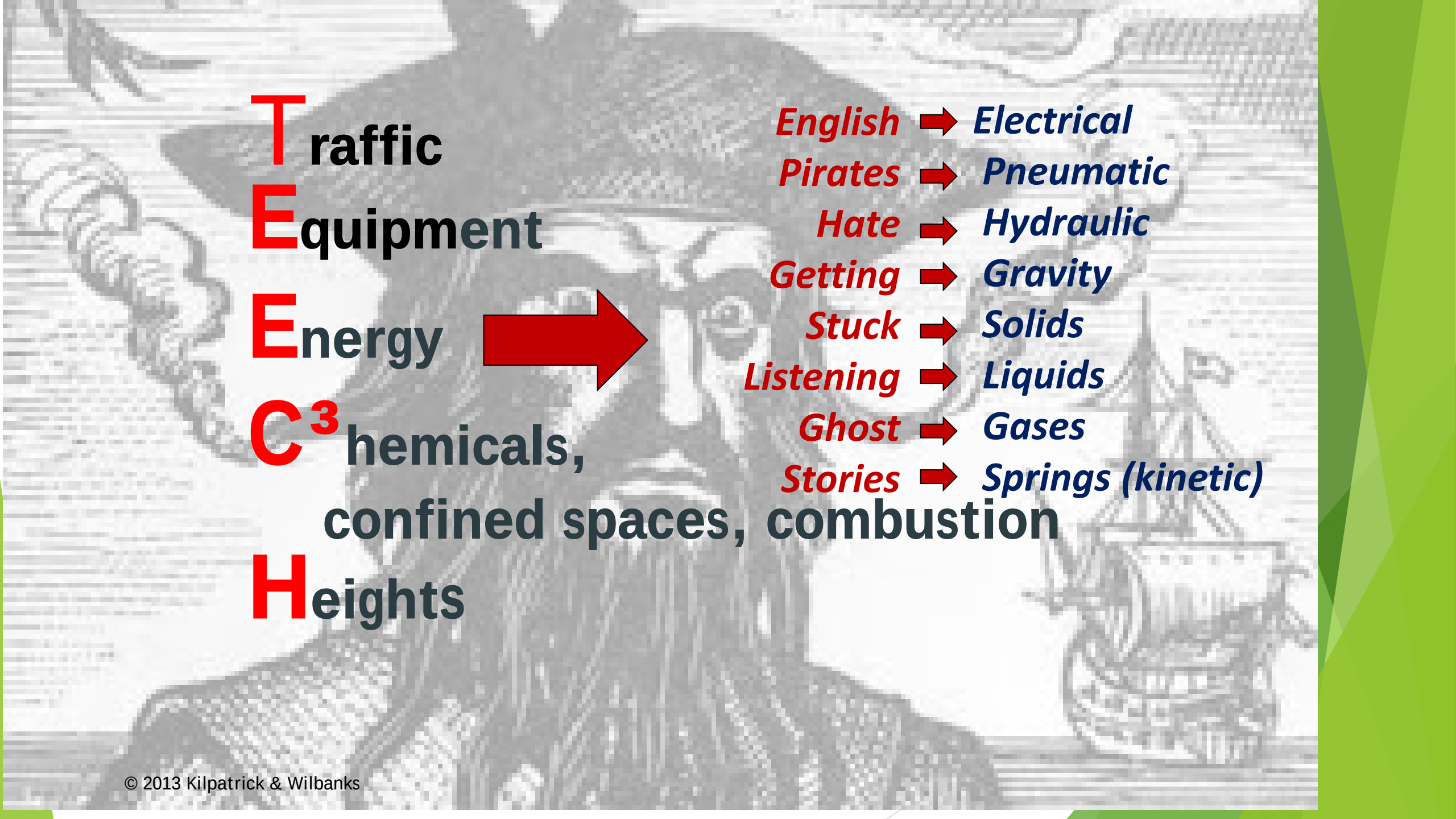
George Miller, 1956, The Psychology Review



The Magical Number Seven, Plus or Minus Two:

Some Limits on Our Capacity for Processing Information

My problem is that I have been persecuted by an integer. For seven years this number has followed me around, has intruded in my most private data, and has assaulted me from the pages of our most public journals. This number assumes a variety of disguises, being sometimes a little larger and sometimes a little smaller than usual, but never changing so much as to be unrecognizable. The persistence with which this number plagues me is far more than a random accident. There is, to quote a famous senator, a design behind it, some pattern governing its appearances. Either there really is something unusual about the number or else I am suffering from delusions of persecution.



Safety Management
Peer-Reviewed

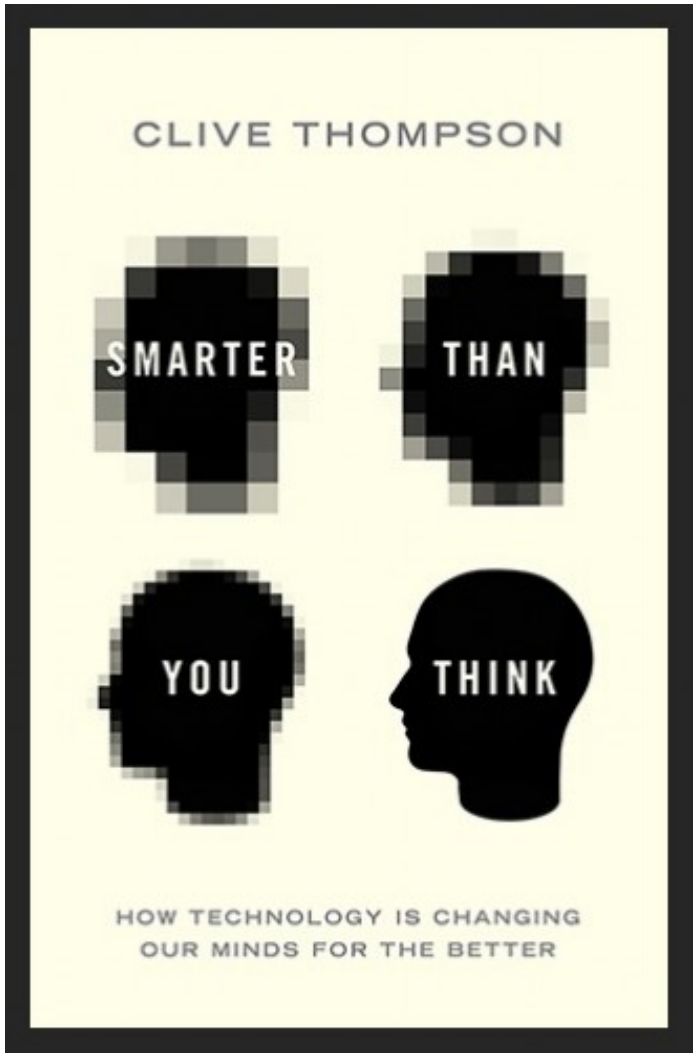
Human Performance Tools

Engaging Workers as the Best Defense Against Errors & Error Precursors

By Jan K. Wachter and Patrick L. Yorio

"Concurrent Verification Peer Checking"

Clive Thompson



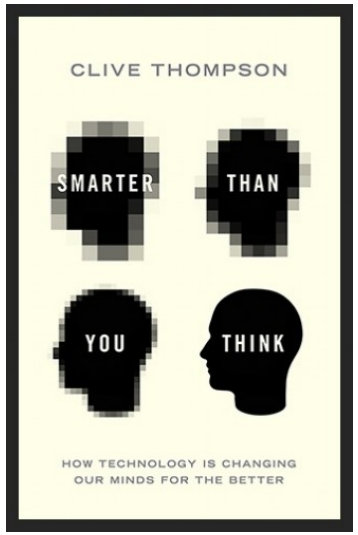
"Our brains have always been terrible at remembering details.

When it comes to quickly retrieving information on the fly, all day long, …we rely on other people."

From Smarter Than You Think: How Technology Is Changing Our Minds for the Better."

Transactive Memory

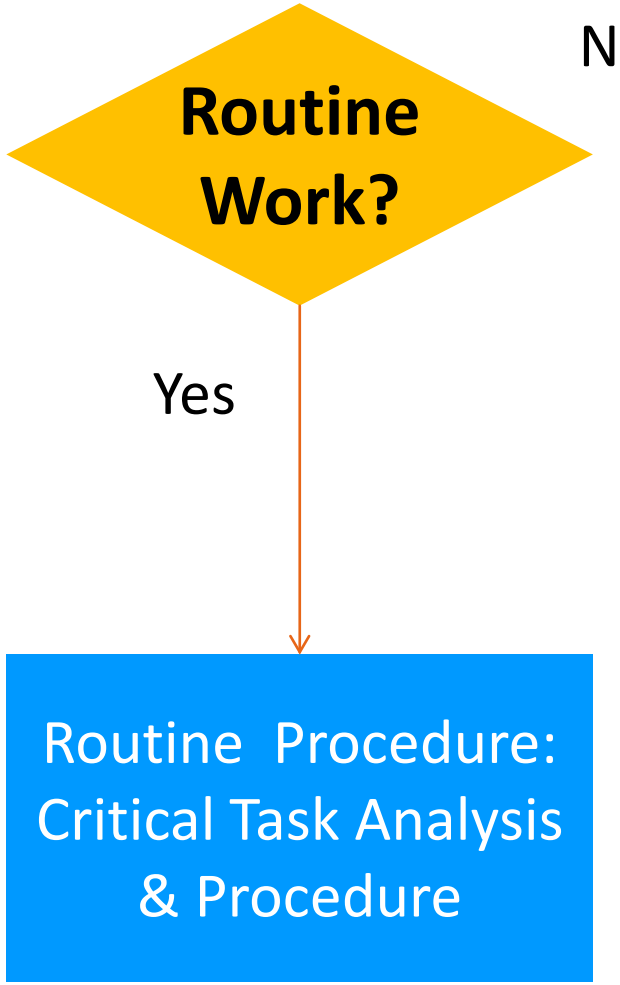
the art of storing information in the people around us..



- Groups relying on each other to recall information performed better than those who didn't use *transactive* memory.
- *Transactive* groups don't just remember better: They also analyze problems more deeply….

From Smarter Than You Think: How Technology Is Changing Our Minds for the Better."

Major Injury Prevention



Preliminary Risk Analysis

For all non-routine work, contractor or own internal personnel, involving a major injury /illness hazard(s)