Do you have a Fatality Risk Blind Spot?

David Eherts PhD CIH
Vice President EHS
For CBIA
May 2017
YOU’VE PROBABLY HEARD OF OUR PRODUCTS

Aesthetics & dermatology

Central nervous system

Eye care

Women’s health

Urology

GI

Anti-infectives

Other (incl. cardiovascular)
A LITTLE BIT ABOUT ALLERGAN EHS

Environment, Health and Safety Results

Engaged/Involved Employees have > 95% correlation to decreasing Injury Rates

Employee Engagement - Good Observations %

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017 YTD</th>
</tr>
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<td>0.57</td>
<td>0.49</td>
<td>0.33</td>
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</table>

Injury Rates - TRIR

Industry Leadership in EHS

Injury Rates among the best

Most progressive programs

GO’s, Gembas, Learning teams...

Allergan being asked for benchmarking

Alcoa, Amgen, Lockheed...

Sustainability Leadership also

Announced at Davos
HOW WE GOT HERE

LEARNING OBJECTIVES

1. Introduce Human and Organizational Performance concepts relating to SIF prevention
   
   Create a paradigm shift in thinking about Safety

2. Demonstrate how HOP Theory has influenced these EHS programs at Allergan

   R2P
HOW DOES OUR COMPANY DEFINE “SAFETY”?
Safety is **not** the absence of accidents.

Safety is the presence of defenses.
HE’S NEVER FALLEN OFF THE ROOF – IS IT THEREFORE SAFE?
IS ZERO THE RIGHT TARGET?

Zero as a metric literally measures nothing and you can’t prevent failure based on knowing nothing

Todd Conklin
THE HEINRICH PYRAMID

Herbert William Heinrich, Industrial Accident Prevention, A Scientific Approach, 1931
IS THE HEINRICH PYRAMID CORRECT?

The lower the incident rate, the higher the fatality rate

State DART rate vs. fatalities graphic
– 2013 RAND Study Am J Ind Med

Corroborating Studies
– Aviation passenger mortality risk 2000
– Occupational Injury Statistics in Korea 2011

Injury rate 1/5 EU rate fatality rate 5 x’s EUs

Disasters don’t happen because someone drops a pipe on his foot or bumps his head. They result from flawed ways of doing business that allow risks to accumulate.

(Elkind and Whitford 2011, p. 7)
The difference between a safe and unsafe organization lies not in how many incidents it has, but in how it deals with the incidents that it has people report.

Sidney Dekker
The Iceberg Of Ignorance

- Problems known to Executives: 4%
- Problems known to Team Managers: 9%
- Problems known to Team Leaders: 74%
- Problems known to staff: 100%

Adapted from "Quality Improvement and TQC Management at Calsonic in Japan and Overseas" by Sydney Yoshida
HOP seeks to understand how humans perform in complex organizational systems so we can build system defenses that are more error tolerant.
ERROR TOLERANCE

If we focus on preventing human error, we design ideal systems that assume successful outcomes but typically fail when errors occur.

OR

Do we design systems that assume errors will occur but still typically result in successful outcomes?

Focus on Systems
ROBUST SYSTEMS

Fragile: Non-Robust

Stable: Non-Robust

Resilient: Robust
KEY PRINCIPLES OF HUMAN & ORGANIZATIONAL PERFORMANCE

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. Management’s response to failure matters

5. The way to prevent incidents is by learning
How many times does the uppercase or lowercase letter “F” appear in the following sentence?

**Finished files are the result of years of scientific study combined with the experience of many years.**
“Mistakes arise directly from the way the mind handles information, not through stupidity or carelessness.”

- Edward de Bono PhD
THE FAST BRAIN AND THE SLOW BRAIN

Slow Brain – Analytical thoughtful actions

Fast Brain – “habitual/reactive/without thinking”
Our actions are primarily directed by the fast brain

What if these brain-centered hazards are exacerbated by the fact that critical organizational elements—including work environments, technological interfaces, operating procedures, work schedules and even work cultures—are not aligned with how the human brain actually works?

Susan L. Koen, Ph.D.

Allergan
THE MONKEY BUSINESS ILLUSION
CINCINNATI ZOO GORILLA/TODDLER INCIDENT, MAY 28, 2016

Should we blame the mother for not paying enough attention to her child?
CINCINNATI ZOO GORILLA INCIDENT
MAY 28, 2016

Or should we make sure the next distracted mother doesn’t have the same outcome?
LEARNING OBJECTIVES

1. Introduce key concepts concerning Human and Organizational Performance
   Create a paradigm shift in thinking about Safety

2. Demonstrate how HOP Theory has influenced EHS programs at Allergan
   R2P
Safety in the 21st Century
Human Performance Influenced EHS Programs

Good Observation Program
GM Weekly Safety Walk-Throughs
CAPA Council
Critical Safety Rules
Pre/Post-shift Musters and Critical Task(s) of the Day
EHS Alerts and Communication
Risk Maps
THE ICEBERG OF IGNORANCE

- Problems known to Executives: 4%
- Problems known to Team Managers: 9%
- Problems known to Team Leaders: 74%
- Problems known to staff: 100%

Adapted from "Quality Improvement and TQC Management at Calsonic in Japan and Overseas" by Sydney Yoshida
**WHAT ARE GOOD OBSERVATIONS?**

**Goals**
- Provide a mechanism for employees to provide management their knowledge
- Find and fix things before incidents occur
- Continually focus on risk reduction

**Definition**
- Documented employee observations that help prevent accidents from occurring. (EHS or management observations are excluded). Good observations may include near misses, unsafe acts or conditions and risk reduction suggestions.
The difference between a safe and unsafe organization lies not in how many incidents it has, but in how it deals with the incidents that it has people report.

Sidney Dekker
GOOD OBSERVATIONS

Started as a metric
Value recognized quickly
Learning Culture
Sets expectations
Facilitates Positive Incentive Program

Becoming an expectation

Actavis and Allergan Operations
Good Observation Rates 2012 - YTD

- 2012
- 2013
- 2014
- 2015
- 2016
- 2017 YTD

0 20 40 60 80 100 120 140 160 180 200
Leadership matters…

“The day soldiers stop bringing you their problems is the day you have stopped leading them. They have either lost confidence that you can help or concluded you do not care.

Either case is a failure of leadership.”

Colin Powell
HYPOTHESIS: GOOD OBSERVATION RATES ARE CORRELATED WITH INJURY RATE REDUCTION
DATA FOR SIGNIFICANCE TESTING

<table>
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We are scientifically certain (greater than 95% confident) that this relationship between Good Observation Rates and TRIR is not due to chance.

28 sites improved or stayed the same in 2015 vs 2014, 12 sites experienced rate increases.
YATES CORRECTED CHI SQUARE TEST WITH A 2X2 CONTINGENCY TABLE

\[ T = \frac{n (|ad-bc| - n/2)^2}{[(a+b)(c+d)(a+c)(b+d)]} \]

\[ T = \frac{40 (|144-24| - 40/2)^2}{[(30)(10)(28)(12)]} = 3.97 \]

<table>
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<th>Good Injury Rate</th>
<th>Poor Injury Rate</th>
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<td>Good GO Program</td>
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<td>Poor GO Program</td>
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<tr>
<td>a</td>
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THEREFORE:

According to percentage points of the chi square distribution table (Table 6) published in Rosner’s Fundamentals of Biostatistics 2nd Edition 1986,

We are scientifically certain (greater than 95% confident) that this relationship between Good Observation Rates and TRIR is not due to chance. In other words,

We are scientifically certain that strong Good Observation rates are associated with improving Total Recordable Injury Rates.
We’ve proved Correlation

But

Is there Cause and effect?
ENTERPRISE JAN 2016:
LEADERSHIP AND EMPLOYEE ENGAGEMENT
RELATIONSHIP TO INJURY RATES FREQUENCY AND SEVERITY
Overall Enterprise Performance January 2016

EHS - CAPA Metrics

Running YTD # of OPEN CAPA's
CAPA's Created (month)
CAPA's CLOSED (month)
CAPA's CLOSED Late (month)
Serious CAPA's CLOSED (month)
Serious CAPA's CLOSED Late (month)
Running YTD # of OPEN Serious CAPA's

Number of CAPA's (All Sites)

January
February
March
April
May
June
July
August
September
October
November
December
Jan-16
Feb-16
Mar-16
Apr-16
May-16
ENTERPRISE 2016 FEB YTD:
LEADERSHIP AND EMPLOYEE ENGAGEMENT
RELATIONSHIP TO INJURY RATES FREQUENCY AND SEVERITY

Good Observations per 100 Employees

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<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016 YTD</th>
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<td>34</td>
<td>39</td>
<td>90</td>
<td>73</td>
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TRIR Injury Rates

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<th>2014</th>
<th>2015</th>
<th>2016 YTD</th>
</tr>
</thead>
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<td>Rates</td>
<td>1.11</td>
<td>0.81</td>
<td>0.54</td>
<td>0.48</td>
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</table>

Leadership Walk-throughs

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<th>Year</th>
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<th>2014</th>
<th>2015</th>
<th>2016 EAC</th>
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<td>Walk-throughs</td>
<td>880</td>
<td>2298</td>
<td>3270</td>
<td>3456</td>
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</table>

ASTM Injury Rates

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<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016 YTD</th>
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<tr>
<td>Rates</td>
<td>2.00</td>
<td>1.03</td>
<td>0.64</td>
<td>0.59</td>
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</table>
Overall Enterprise Performance February 2016

EHS - CAPA Metrics

- Running YTD # of OPEN CAPA’s
- CAPA’s Created (month)
- CAPA’s CLOSED (month)
- CAPA’S CLOSED Late (month)
- Serious CAPA’S CLOSED (month)
- Serious CAPA’S CLOSED Late (month)
- Running YTD # of OPEN Serious CAPA’s

Number of CAPA’s (All Sites)

January
February
March
April
May
June
July
August
September
October
November
December
Jan-16
Feb-16
Mar-16
Apr-16
May-16
ENTERPRISE 2016 FEB YTD:
LEADERSHIP AND EMPLOYEE ENGAGEMENT
RELATIONSHIP TO INJURY RATES FREQUENCY AND SEVERITY

**Good Observations per 100 Employees**
- 2013: 34
- 2014: 39
- 2015: 90
- 2016 YTD: 73

**TRIR Injury Rates**
- 2013: 1.11
- 2014: 0.81
- 2015: 0.54
- 2016 YTD: 0.48

**Leadership Walk-throughs**
- 2013: 880
- 2014: 2298
- 2015: 3270
- 2016 EAC: 3456

**ASTM Injury Rates**
- 2013: 2.00
- 2014: 1.03
- 2015: 0.64
- 2016 YTD: 0.59
Coincidence?
Safety performance in many companies and even whole industries has stalled in the past few years. Accidents rates are at a “plateau” and yet, serious accidents and fatality rates are not. In more dramatic cases, such as in the BP Deepwater oil disaster, organizations that have “exemplary” safety statistics, suddenly have a catastrophic or multi-fatality event. Are there common features in these organizations’ mindset? What characterizes these organizations’ decision-making, their approach to safety and to risk and are there specific cultural features that can be delineated?

The reason your TRIR is so low is not simply because of employee engagement nor your high rate of CAPA closure (find-and-fix), but because you’ve convinced your employees to constantly look for hazards, unsafe conditions or actions to report per your Good Observation program. They’re simply more risk-aware and cognizant of their environment.

In other words, you’re coaxing them into a state of hyper-vigilance.
GOOD OBSERVATIONS AND LEADERSHIP LEADING SAFETY

“...I want to thank you for participating in the “GO” program, your GO’s are certainly worthy of winning but almost more importantly it is people like you that are driving this program forward and keeping the safety awareness high at our facility.

I believe that this program is the single biggest factor keeping people safe at the site.

If you think about it, if only the EHS team were actively involved in making the site safer, there is a real limit to how much they can get to observe and react to on a monthly basis. With the GO program, we have over 700 people having the ability to catch an issue before someone gets hurt.

Thank you again for your great GO’s and helping keep all of us safe.”

Dermot Manton – VP, GM Waco - 2017
Safety in the 21st Century
Human Performance Influenced EHS Programs

Good Observation Program
GM Weekly Safety Walk-Throughs
CAPA Council
Critical Safety Rules
Pre/Post-shift Musters and Critical Task(s) of the Day
EHS Alerts and Communication
Risk Maps
CRITICAL SAFETY RULES
PRE-SHIFT MUSTERS

PURPOSE

2.1 Consider risk reduction measures that eliminate conditions that have a potential for a Serious Injury or Fatality (SIF) i.e., tasks that involve a Critical Safety Rule.

2.2 Prevent potential SIFs by conducting pre-shift risk assessments which address the two precursors of almost every fatal accident:

(1) There is sufficient energy in the process to kill

(2) The worker is often unaware of the critical risk i.e., they’ve become complacent.

Pre-shift risk assessments can prevent most, if not all, workplace fatalities by preventing complacency, ensuring the risks are well understood and that all precautions have been taken.
THE FAST BRAIN AND THE SLOW BRAIN

Slow Brain – Analytical thoughtful actions

Fast Brain – “habitual/reactive/without thinking”
Our actions are primarily directed by the fast brain

What if these brain-centered hazards are exacerbated by the fact that critical organizational elements—including work environments, technological interfaces, operating procedures, work schedules and even work cultures—are not aligned with how the human brain actually works?

Susan L. Koen, Ph.D.
THREE QUESTIONS TO PREVENT SIF’S

1. What task could cause immediate, non-recoverable harm to people or the facility?
2. What should we do to ensure this task for this work at this time is successful?
3. When this task fails, what is it that keeps you from being killed or seriously injured? Is that enough?

Todd Conklin, Ph.D.
Do any of our planned tasks today involve a critical safety rule?

Error Traps and Error-Likely Situations

- Rushing
- High workload
- Unclear labeling
- Inaccurate procedures
- Unexpected conditions
- Stress

Agree on Stop Work Criteria.
Discuss precise criteria before shift begins
Write them down and agree upon them
This in addition to Critical Tasks of the Day

Discuss the Critical Control
Consult the Supervisor prior to initiating the task
Tools available to facilitate this process
SPEAK – Pre-shift and CLEAR – Post Shift

Start When Sure
PRE-SHIFT MUSTER EXAMPLE

DO WE HAVE TO WORK ANYWHERE TODAY ABOVE SIX FEET FROM THE GROUND?

ARE THERE RAILINGS IN PLACE?

DO YOU HAVE TO CARRY ANYTHING UP OR DOWN?

WHAT PRECAUTIONS WILL YOU TAKE?

COME GET ME BEFORE YOU DO THIS. OKAY?

ARE WE HANDLING ANY FLAMMABLE SOLVENTS OR REACTIVE CHEMICALS TODAY IN ANY OF OUR PROCESS STEPS?

WHAT CONTROLS ARE IN PLACE TO PREVENT A FIRE, AN EXOTHERMIC RXN OR EXPLOSION?

Stop Work Criteria?
IN CONCLUSION

The difference between a safe and unsafe organization lies not in how many incidents it has, but in how it deals with the incidents that it has people report.

Sidney Dekker
Thank you for your valuable time!

Questions?