

Heinrich Deconstructed

(and reconstructed!)

A Safety Revolution in Progress

ENFORM

Banff 2013

Petroleum Safety Conference, May 2013

Pick a Causation Theory!

- Domino Theory of Accident Causation
- Human Factors Theory of Accident Causation
- Epidemiological Theory of Accident Causation
- Systems Theory of Accident Causation
- Behavioral Theory of Accident Causation
- Drugs and Accident Causation
- Depression and Accident Causation
- Management Failures and Accident Causation
- Obesity and Accident Causation

*Occupational Safety and Health for Technologists, Engineers,
and Managers, 7th edition.*

Some brief historical context

- Heinrich's Causation Theory: the 88-10-2 Ratio
- Heinrich professed that among the direct and proximate causes of industrial accidents:
 - 88% are unsafe acts of persons.
 - 10% are unsafe mechanical or physical conditions.
 - 2% are unpreventable (i.e. acts of God).

Krause took this further

- “In the majority of cases – from 80% to 95% - accidents are caused by unsafe behavior. This statement emphatically does not mean that the injury is the employees fault”.

Source: “The Behavior-Based Safety Process” Krause, Hidley & Hudson

Dupont went even further still

- 10 year study across all DuPont sites
- 96% of injuries resulted from ‘unsafe acts’ and “poor work practices”

Dupont, 1986

And Difford has gone even further still

“Whilst generally supportive of Heinrich (1941), Difford presents the case to revise Heinrich’s finding that 88% of accidents result from unsafe acts and proceeds to logically adjust that figure to 98%”

Keith Scott, Chairman International Institute of Risk and Safety Management

Are Difford, Heinrich and their advocates wrong?

While there have been many critics of Heinrich, it is worthwhile to note that “Heinrich's 88% has been dismissed and criticized, *but not refuted*”

Difford on LinkedIn (EHSQ Elite)

So What?

According to Fred Manuele, “Heinrich’s. . . ratios have had the greatest impact on the practice of safety”

How? - “It has also done the most harm”

Why? - “Since it promotes preventive efforts being focused on the worker, rather than on the operating system”.

DOES IT?

Heinrich Revisited: Truisms or Myths

Borderline unethical?

A Manuele colleague who is disturbed by safety professionals who reference Heinrich premises as fact, says, “It is borderline unethical on their part.”

Source: http://www.asse.org/professionalsafety/pastissues/056/10/052_061_F2Manuele_1011Z.pdf

Manuele's bottom line

“The premise discussed here (unsafe acts/practices/behavior of humans) are the principle causes of occupational accidents are wrongly based and cannot be sustained by safety practitioners”.

Source: http://www.asse.org/professionalsafety/pastissues/056/10/052_061_F2Manuele_1011Z.pdf

Manuele's call to safety professionals

- Stop using and promoting these premises
- Dispel these premises in presentations, writings and discussions;
- Apply current methods that look beyond Heinrich's myths to determine true causal factors of incidents.

Enter Paul Difford and “Redressing the Balance” (2011)

Accident causation

“There are many who believe that management or organizational failures are cause all accidents”.

That’s “absurd” according to Difford.

Redressing the Balance, 2011

- Management failures cause all accidents - Myth
- Reason's Swiss Cheese Model and Bird's management failure model - Disproved
- The 'so called' Organization Accident - Myth
- Petersen's multiple causation theory - Disproved
- Heinrich's Accident Causation Theory - Empirically and logically valid with modification

“Redressing the Balance” supported by

- Ten year study about current models of causation
- 114 books
- 56 publications and papers
- 18 UK, EU and USA case studies, and
- 10 web site investigation/causation references

A perspective on Heinrich's 88%

“A common, if not ‘convenient’ misinterpretation is that this in some way equates to a theory that blames front-line workers, but *that is not the case*”

Source: Difford, 1998

Some perspective - What is a Causal Factor? (in my world)

“Mistakes or failures that, if corrected, could have prevented the incident from occurring or would have significantly mitigated its consequences”

NOTE! “Mistakes or failures” does not indicate blame. It is simply a statement of fact.

Source: TapRoot®: Changing the Way the World Solves Problems. P. 77

By Mark Paradies and Linda Unger

Management Failure School of Philosophy

Based almost exclusively on the belief that a man is never the cause of his own behavior, i.e. that a man is never responsible for his own actions.

On the one hand, Petersen stated that management 'invariably' causes all accidents. . . Yet Petersen himself was even forced to concede:

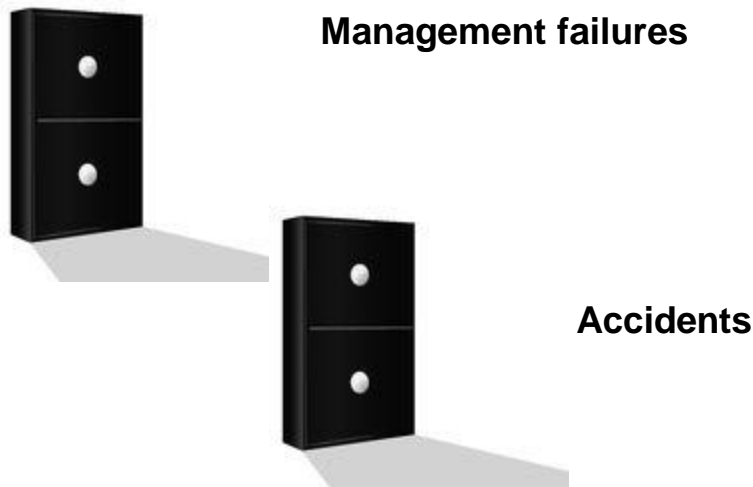
“a painfully obvious and simple truth. . . people, not things cause accidents”

(Petersen 1979:15)

Source: Difford, p. 161

How many dominos do we need?

If Bird and Petersen genuinely believed that management failures always cause accidents then there is no reason for his domino sequence to look anything other than the depiction below:



Why Difford's work is unsettling for many in the safety community:

- **It requires a questioning of the widely held belief that management or organizational failures are the root causes of most, if not all, accidents.**
- “There is, in fact, no such thing as an organizational accident” (it's an academically miscalculated invention).”
- For some, all their rhetoric and money making ideas and programs are seriously challenged

So where does this leave us?

- We have 2 very distinct camps, both supported by their research/perspectives and theories

Difford is of the opinion they cannot co-exist

Management failures, organizational accidents and multiple-causation theories of causation

vs


Management cannot possibly cause all accident approach



What to believe and why?

Acts of God aside, (or more correctly, the unpredictable and uncontrollable consequence of natural phenomena) **human behavior, irrefutably, will be the proximate cause of any preventable accident.**

OR



Management or organizational failures
cause all accidents

What to do?



Prevention vs Causation

Note: “what caused a particular accident is not answered by listing things that would have prevented it”.

So what? Why should I care?


- It will help us determine effective prevention strategies
- It will put our resources in the right place, for the right reasons
- It's about people – let's emphasize what's important
- Alternatively, we'll continue to be polarized
- We'll have no accepted body of knowledge on causation
- Let's get our own house in order
- Safety is still in growth and pursuing maturity.

How about you. . . What will you do?




In closing

The focus of this presentation is
CAUSATION.

- 
- Many of us use models and software that encourage (if not force) us to dig deeply into the systems and processes that were in some way associated with the accident in question.

 - We will all, and must, continue to do this. However...



What we can do to prevent incidents is not the same as what the evidence indicates is the cause of incidents.

The two (prevention/causation) are always correlated (or associated) but, not necessarily causally related.

Do your own research

Consider:

- Redressing the Balance (Difford)
- Heinrich Revisited: Truisms or Myths (Manuele)

As well as the following links which will be helpful:

- <http://www.nsc.org/safetyhealth/Pages/Examiningthefoundation1011.aspx#.UDFonPVHCVo>
- http://www.asse.org/professionalsafety/pastissues/056/10/052_061_F2Manuele_1011Z.pdf
- <http://www.neucom.eu.com/documents/REPLYTOASSEMANUELE.pdf>
- <http://www.neucom.eu.com>



Consider This:

The Backfire Effect by David McRaney

- **The Misconception:** When our beliefs are challenged with facts, we alter our opinions and incorporate the new information into our thinking.
- **The Truth:** When our deepest convictions are challenged by contradictory evidence, our beliefs get stronger.



Confirmation Bias

- **The Misconception:** Our opinions are the result of years of rational, objective analysis.
- **The Truth:** Our opinions are the result of years of paying attention to information which confirmed what we believed while ignoring information which challenged our preconceived notions.



Where will you stand?

“Unpredictable and uncontrollable consequences of natural phenomena aside, human behavior, suitably defined, will be the underlying cause of any accident.”

Or

“Management failures and the organization are the cause of all accidents.”