



Tom McDaniel

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Enhancing Safety, Quality and Reliability thru Human Performance

Greetings from St. Petersburg, Florida



Photos courtesy of the city of St. Petersburg, FL

To err is human



Most errors have minimal consequences

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Human Performance

To err is human



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Most errors have minimal consequences

Human Performance

To err is human



Most errors have minimal consequences

Human Performance

Medical



Aviation



Military



What is common among these industries?

Petrochemical



Nuclear



Human Performance

Medical



Aviation



Military



All are critical outcome industries

Petrochemical



Nuclear



Human Performance

Medical



Aviation



Military



The smallest human error (that is allowed to progress) is usually the contributing factor for all incidents

Petrochemical



Nuclear



Human Performance

Medical



Aviation



Military



And, they all don't necessarily get it right

Petrochemical



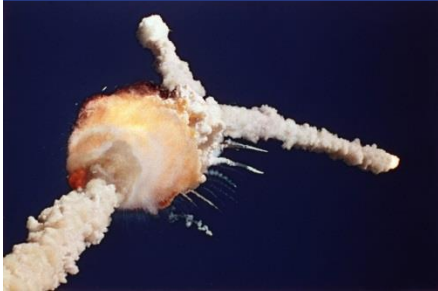
Nuclear



Examples

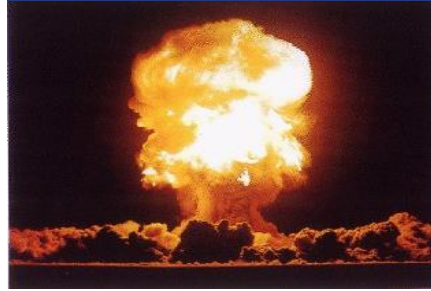
1986

Space Shuttle Challenger



1986

Chernobyl Nuclear



1988

Piper Alpha



~85% of all incidents are the result of human performance

1989

Exxon Valdez Oil Spill



2003

Space Shuttle Columbia



2010

BP Deepwater Horizon



Opportunity

210,000 – 400,000*

*Journal of Patient Safety

deaths per year who seek medical care

**And they still
blame
the nurses!**



Some get it right!

~100,000,000

cognitive errors but very few incidents

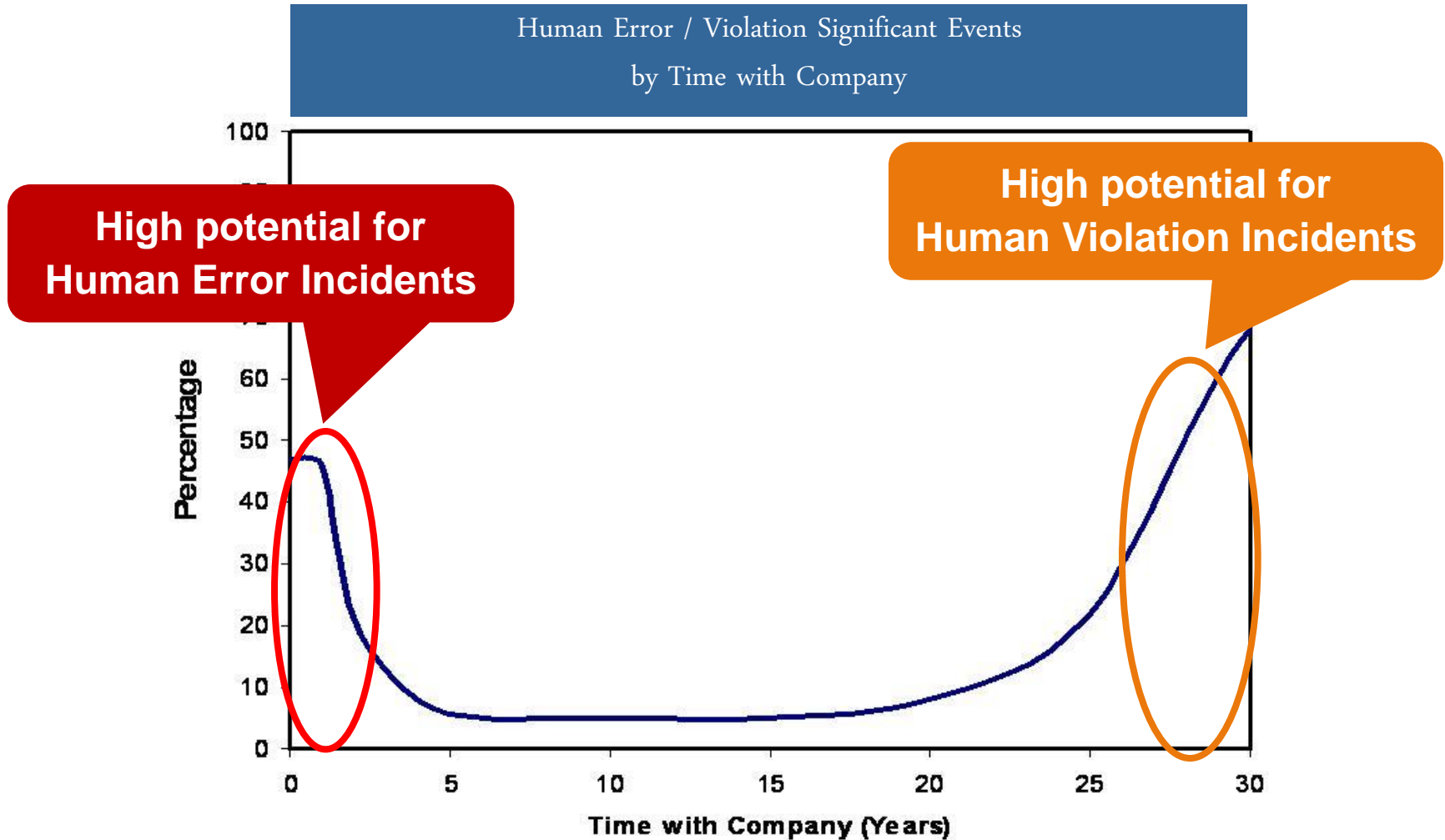


What we learned from Industry and Academia

- You **can't stop** Human Error (the cognitive act)
- You **can intervene** between error and incident
- You **can learn to recognize** error-likely situations
- Human Performance includes **violation recognition** and management as well
- Understanding these fundamentals **opens opportunities**



Where are the Human Error / Violation Events?



Truths of Human Performance

People are fallible, and even the best make mistakes



Error-likely situations are predictable, manageable, and preventable



Individual behavior is influenced by organizational processes and values



People achieve high levels of performance based largely on encouragement and reinforcement received from leaders, peers & subordinates



An understanding of the reasons mistakes occur, and application of the lessons learned from past events, can avoid future events



Our Truths...

No one comes to work to cause a Safety or Quality incident

Past and current interpretations are no proof of truth

Can't fix Safety by focusing on Safety

People want to do a good job

You can't stop cognitive errors, but you can be incident free



Organizations are people, not machines

People don't think and act alike

Little things make a difference

Language is fateful

Violation is a normal event which increases with experience

You can't fix people, but you can fix the systems that influence their behavior

Perception of risks varies and what is deemed acceptable varies from person to person

You can always intervene between error and an incident

We forget to be afraid ! ... become risk tolerant

Traps that Increase the Potential for Human Error

1. Time pressure (in a hurry)
2. Distractions / interruptions
3. Unfamiliarity with task
4. Stress
5. High workload
(memory requirements)
6. Changes / departure from routine
7. Lack of knowledge
8. Habit patterns
9. Simultaneous, multiple tasks
10. Confusing displays / controls
11. New techniques
12. Assumptions



Opposing Views of Human Error

Historical View of Human Error

- Human error is **the cause of many accidents**.
- The system in which people work is basically safe; success is intrinsic. The **chief threat** to safety comes from the **inherent unreliability of people**.
- Progress on safety can be made by **protecting the system from unreliable humans** through selection, procedure creation, automation, training and discipline.



Opposing Views of Human Error

Emerging View of Human Error

- **Safety is not inherent in systems.** The systems themselves are contradictions between multiple goals that people must pursue simultaneously. People have to create safety.
- Human error **that is allowed to progress to an incident** is a symptom of trouble deeper inside the system.
- **Human error is systematically connected to features of people, tools, tasks and operating environment.** Progress on safety comes from understanding and influencing these connections.



Goals of a Human Performance Program

Build management systems that intervene between cognitive error and an incident

Learn to recognize error-likely situations

Achieve Zero Harm



An effective HuP Program...

Achieves Zero Harm

Identifies and prevents incidents due to errors – both latent and active



Promotes a culture where it is understood errors occur, and where value is placed in the reporting of errors

Encourages performance by
→ *Setting*
→ *Communicating*
→ *Enforcing*
Standards

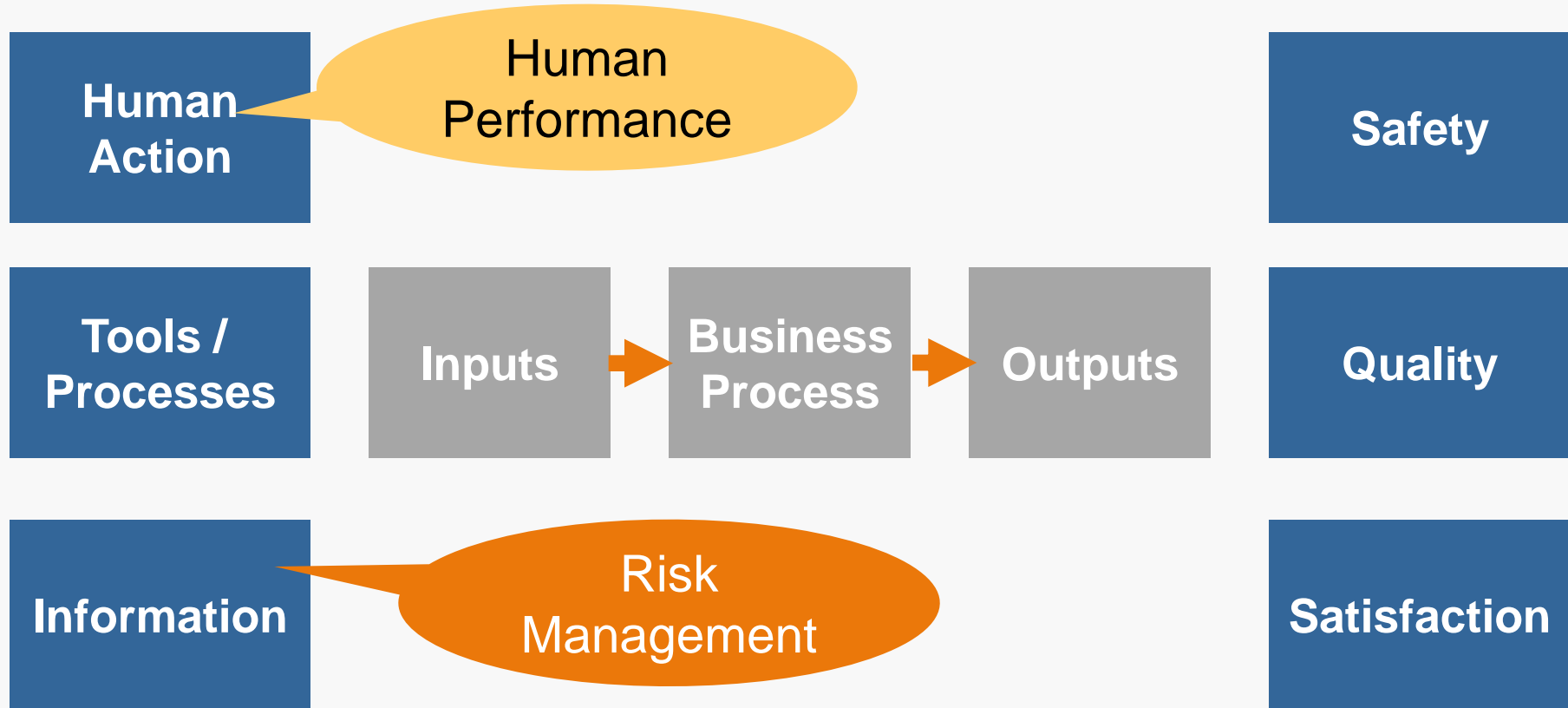


Teaches techniques for
→ *Noticing*
→ *Observing*
→ *Assessing*
error-likely situations

Recognizes violations and the intervention between violation and an incident











The Big Picture...Loss the reason for Action



Managing inputs is called Loss Control

Human Performance Tools

-  **Self Check (STAR)**
Stop – Think – Act – Review
-  **Procedural Adherence and Placekeeping**
OOPS – Outside Of Procedure, Stop
-  **Pre-Job Briefing**
Ensure safety, quality and reliability
-  **Questioning Attitude**
When in doubt, ASK!
-  **Three-Way Communication**
For all exchanges of critical information that will result in a direction, action or decision.
-  **Peer Check, Independent Process Verification**
An opportunity to intervene between (unavoidable) human error and (avoidable) incident.
-  **Take Five**
Pre-Task Analysis and Post-Task Critique to improve safety, quality and efficiency
-  **Observations – Worker, Work, Workplace**
Situational awareness to support safety, quality and reliability

Just Culture...

A shift in thinking from a *Blame* and *No-Blame* Culture

Blame Culture

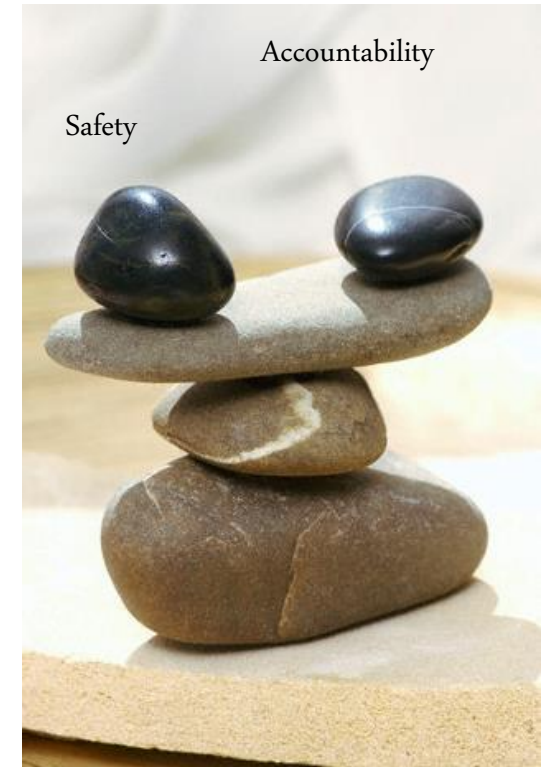
An unwillingness to report ANY type of incident for fear of criticism or prosecution

Just Culture

A Just Culture can satisfy demands for accountability while contributing to learning and improvement

No-Blame Culture

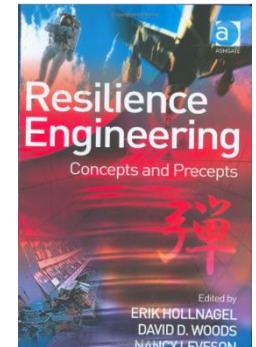
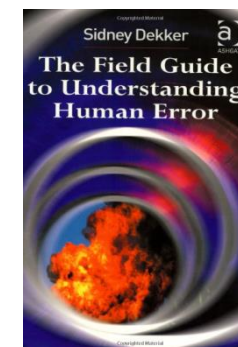
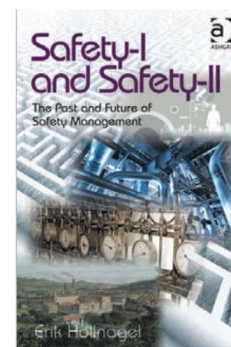
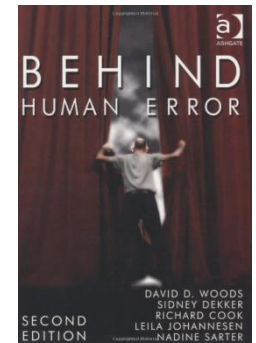
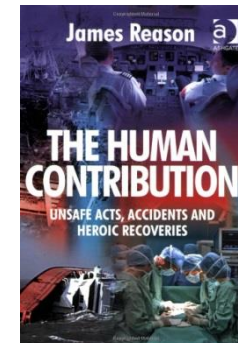
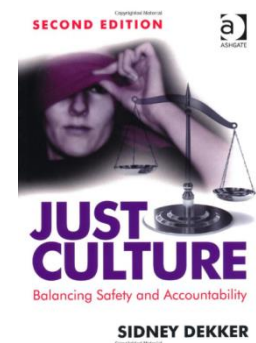
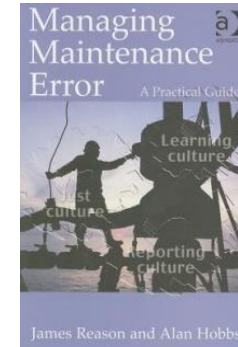
Minimal or no accountability for incidents



A reporting and blame culture can't co-exist

Recommended Readings

- ***Managing Maintenance Error***
James Reason
- ***The Human Contribution***
James Reason
- ***The Field Guide to Understanding Human Error***
Sidney Dekker
- ***Just Culture – Balancing Safety & Accountability***
Sidney Dekker
- ***Behind Human Error***
David D. Woods
- ***Resilience Engineering***
Erik Hollnagel
- ***Safety I and Safety II***
The Past and Future of Safety Management
Release Date May 2014
Erik Hollnagel



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