Workplace Transport
Health and Safety Executive

“Human Factors”

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Trade-offs & the “Unrocked boat”

From Reason 1997

Bankruptcy: Better defences converted to increased production
Un-rocked boat
Catastrophe
Increased investment in protection

Production
Accidents & injuries

Losses & bankruptcy

“I don’t know how to do my job”

Sickness & Resignations
Accidents & injuries

Losses & bankruptcy

Sickness & Resignations

“I don’t have the resources to get the job done safely”
LTI’s

- Already happened
- “independent”
- Driving using only the rear mirror?
- very infrequent (thankfully)
- We need predictors of safe performance, “leading indicators”
Leading indicators?

- Predictive of accidents
- Gas detection vs fire alarm inspection
- Attendance at training?
- Near miss reports acted upon
- Un-actioned defect reports (-ve)
- Need to be things that we can change: not independent
Rig safety check refused before tragedy

Drilling rig operators refused to allow a safety inspection just days before two men died in a fire in an oil rig at a Dundee dock.

Global Marine UK have confirmed that they turned down a request by the fire brigade to inspect the installation.

The operators say the rig manager turned down the inspection request because there were already additional personnel aboard and because safety procedures - including fire cover - were already in place.

Although the fire was put out swiftly it took fire fighters four hours to recover their bodies because of the difficulties they encountered.

Molten metal from gas cutting fell on the oxy-acetylene hoses in a confined space. The leaks were taped over...
How to stay alive...

(Acknowledgments to: James Reason Human Error 1990)
Where’s the innovation in accidents?…..

Gravity is clearly still a bit of a puzzle…..

When doing a Risk Assessment at the least include the incidents and near misses you have actually had. (Oh and ask your “neighbours” about their experience)
If your staff told you they were planning to: “Work to rule”

• Select A, B, or C:
• A) You would be pleased because things would go well and productivity would improve.
• B) Now what do they want, we’ll never make any money.
• C) That’s nice but they do that anyway.
Learning and reinforcement

A
Antecedents
“I’m late”
Management reward following procedures
Short cuts are not condoned.
Short cuts are the norm. Management condoned.
“Just get it done..”

B
Behaviours
Speed
Follow rules
Take shortcuts

C
Consequences
1/100 chance of crash
Safe behaviour
Job well done
99/100 it works
1/100 accident
## What gets rewarded on your site?

<table>
<thead>
<tr>
<th>Consequences</th>
<th>Positive/ negative</th>
<th>Immediate Or future</th>
<th>Certain/ uncertain</th>
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<tbody>
<tr>
<td><strong>Unsafe site</strong></td>
<td></td>
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The employee as a hazard.....

(Acknowledgments to: James Reason Human Error 1990)
The employee as a defence.....

(Acknowledgments to: James Reason Human Error 1990)
• The employee as a hazard:
  • They need to be closely managed.
  • The less of them the better.
  • Less thinking, more procedures.
  • Blame in investigations.
  • QRA* will focus on human error rate.
    – *Quantitative Risk Assessment

• The employee as a defence:
  • They need to be trained, alert and there.
  • They are a valuable contribution to the business.
  • How can I make their life easier?
  • QRA will focus on “defences in depth”.
  • Error tolerant design.

People do not go to work to have an accident
A lesson from fires

- Regulations primarily apply to businesses that are empty when they catch fire
- Most deaths are upstairs in homes. 3 storey and above very high risk.
- Biggest reduction:
  - Smoke detectors
  - Microwave chips

*Remember:*
1. Regulations are important but they do not cover everything.
2. Regulations have often evolved for historical reasons and do not address the real world.
3. Simple consumer technologies can have a big impact.
Bombay High offshore installation 5005: Risk assessment identified that the installation was vulnerable to ship collision because a critical pipe was unprotected. Work was planned to build a guard around the pipe.
On 28 July 2005 the dive support vessel collided with the installation, the edge of the vessel’s heli-deck cut the pipe. 10 employees (from 220) and 40% of India's crude oil supply were lost.

The hazards identified in risk assessment are real and require action.
Railways:

- Industry collect SPAD* data by driver
- Rate is too high so they make a 3 SPAD = sack
- No change
- HSE commission a re-analysis of the data
- 95% SPADs occur at 5% of signals
- Signals behind bridges, over the top of hills, around corners, between tracks (SN 109 Paddington)
- Drivers always knew this.
  - *Signals Passed At Danger
Apply a large dose of common sense......

- during the leaf fall season, where the leaves fall onto the sensors rendering them inoperable. We are advised that Railtrack switch the lights off during leaf-fall so that the crossing cannot be used, and therefore maintaining a safe method of working.
View from tool-pusher’s cabin, drilling rig, 2005.  500 ton draw-works. 700hp drive

Give people *reasonable* tasks!
UK Offshore oil platform, 2006, 33000 barrels per day: who’s fault if there’s an error?
“Pushing the envelope….”

“We are a learning organisation…”

“How do I stop employees leaving their brains at the heliport…?”

“Never ever think outside the box.”

“Over 40% of offshore workers believe that the PTW exists to protect the employer not them”
One set of rules not two….
For the workers:  
For the Board:

Acknowledgements to www.bad-designs.com

Acknowledgements to Amazon.com
Selection for driving things.

- Some physiological elements: eyesight, hearing, reaction time.
- Some aptitudes: situational awareness, spatial awareness
- Some personality traits to be avoided but not those in the tests:
  - Anti-social behaviour, thrill seeking, dependency / addiction prone, attention deficit/boredom
- But driving / warehouse jobs are often used for rehabilitation of these people.
Trojan horse construction site

**safety messages:** Prepared by Steel Construction Institute

for the Health and Safety Executive 2005

**RESEARCH REPORT 336**

Language independent safety messages.
Stuck to loads at supplier/manuf’r
Safe work space

- Driving knowledge
- Site knowledge
- Safety knowledge
Dinosaurs: Safety is a competitive *disadvantage*

Safety managers don’t stay long....
Stage 1 Enlightenment: The separation of safety from finance

The safety department is separate and powerful
Fully Enlightened: Safety is a competitive advantage

These Organisations typically do not have a safety department
If your really believe in this stuff:

- PPE is free to use at home-DIY and Gardening.
- Driver training includes safe driving outside work (ie motorcycles or trailers).
- Risk assessment examples assist employees in their own lives. (ie DIY, travel plans, finance?).
- The MD keeps to the speed limit on the way to work.
- Employees have their personal safety budget.
CORPORATE MATURITY AND CONTINUOUS IMPROVEMENT.....

- **Maturity**
  - Level 5: Continually improving.
  - Level 4: Co-operating.
  - Level 3: Involving
  - Level 2: Managing
  - Level 1: Emerging

- **Responsibility**
  - We all develop safety together
  - Safety is shared with the team and management
  - Safety is both my and management responsibility
  - Safety is the management's responsibility
  - Safety gets in the way.

- **Reporting**
  - We suggest solutions and work on these with management
  - We fill in forms for near misses too
  - We try to include reasons on the form
  - We complete the statutory forms
  - We don’t report anything to management

- **Enforcement?**
  - Collaboration developing safety including regulation
  - Collaboration on solutions
  - Education and information
  - Enforcement notices
  - Surprise visits and Prosecution

- **Knowledge**
  - Double-loop learning
  - Single loop learning
  - Corporate knowledge is codified and verified
  - Knowledge is unverified and local
  - No one knows what they are doing

**IMPROVING SAFETY CULTURE**

**INCREASING TRUST**