Designing an Error Tolerant Workplace

Using ICAM Proactively

QMIHSC 2002, Townsville

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Insanity or false hope?

"Continuing to do the things we have always done, and expecting to get different results."

Jim Kearns (Dupont)

"If you keep doing what you always did, you'll keep getting what you always got"

Yogi Berra (catcher New York Yankees)

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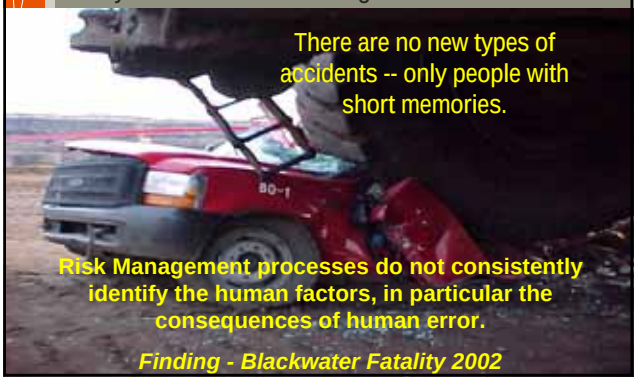
Sanity or the facts of life in high hazard industries?



There are no new types of accidents -- only people with short memories.

Risk Management processes do not consistently identify the human factors, in particular the consequences of human error.

Finding - Blackwater Fatality 2002

BHP Billiton fatality review findings

Sample

- 189 fatalities from 175 events

Findings

- No correlation with low injury rates (e.g. Moura)
- Fatality prevention is not a by product of LTIFR reduction
- A low level of safety awareness @ all levels of the workforce
- Passive tolerance of zero consequence at risk behaviours by management
- Lessons from previous incidents not implemented, communicated or reviewed.

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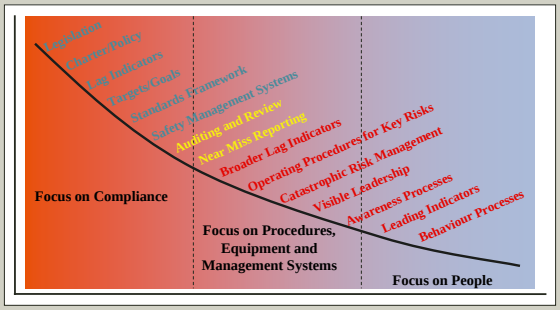
Safety improvement roadmap



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Strategic approach to Zero Harm

- Systems and procedures alone are not the way forward
- Must be simple and practical
- Focus on prevention and risk reduction
- Management standards as the foundation
- Leadership and line accountability as the key
- It's about people - focus on mindset, behaviours and awareness

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Putting rubber on the road

- Broader safety measurement indicators
- Incident reporting based on risk not consequence
- HSEC management standards
- Strategies for safety leadership at all levels
- Operational standards for controlling fatal risk
- Catastrophic risk management
- Company wide lead indicators development
- Behaviours and awareness improvement programme
- A continuously improving safety culture

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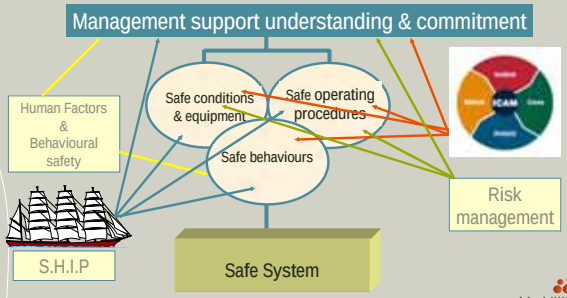
Paving the way



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Building the vehicle for our journey to zero harm

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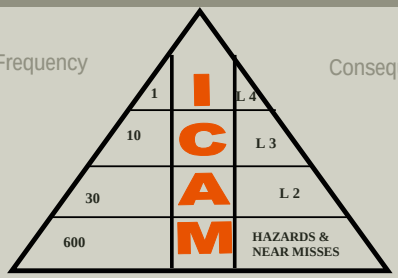
ICAM Utilisation



Depth of investigation and reporting requirements vary by consequence. ICAM process is the same for all levels of consequence

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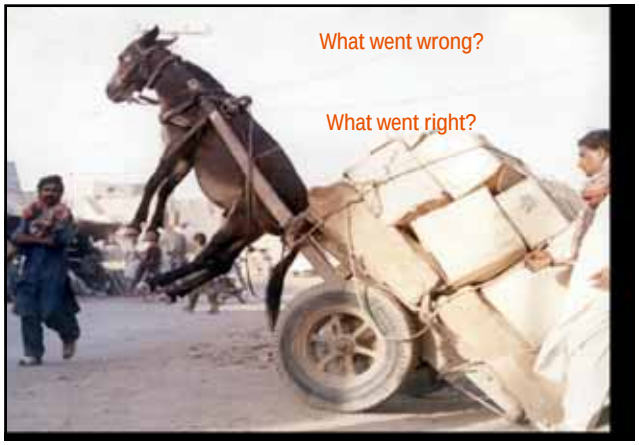

Which event would get investigated ?

Is there common learnings from both events?

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What are we doing about effecting change ?

- Develop a new investigation procedure for BHP Billiton based on potential risk
- Simplified & combined notification & investigation form incorporating ICAM
- Workforce trained and involved from the start
- Multi level investigation training to cascade ICAM down through the organisation :
  - Lead Investigator Course — 1100 trained to date
  - Basic Investigation Course — self rollout by sites
  - ICAM Induction course — all employees & contractors
  - Train the Trainer for site self rollout.

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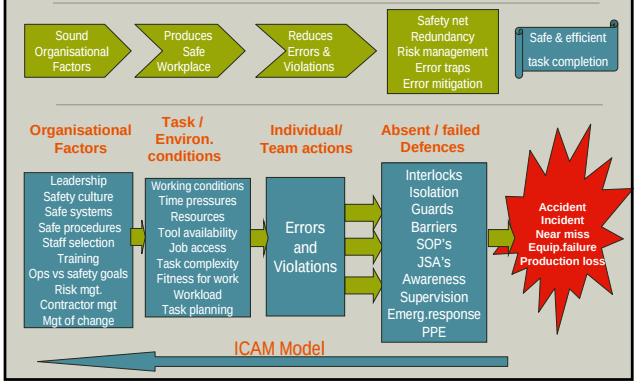
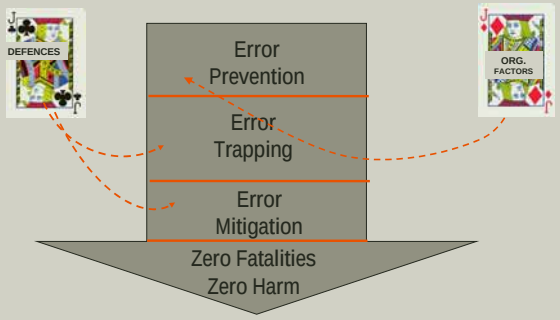
Adverse outcome prevention



Learning the right lessons at the lowest cost

Safety performance improvement strategies



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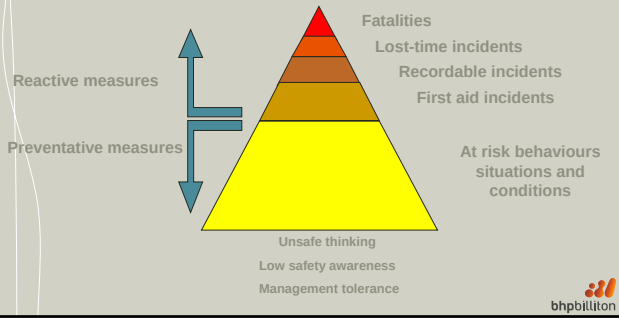
Why behaviours are important



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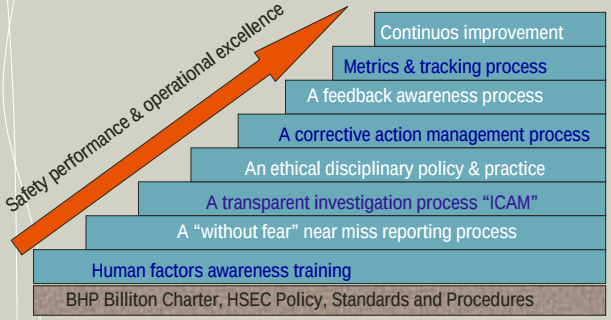
Key elements of behaviour management



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How can we improve behaviour and manage error?

- Incorporate human factors into inherently safer design practices, management practices, and into improvements in the work environment
- Training on human factors and incorporating human factors in all training activities
- Incorporating human factors into risk assessment activities
- Get human factors into the culture
- The key objective - *to reduce the number and likelihood of situations to produce error.*

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In Summary

- It is understood that, like equipment, humans have a 'performance envelope'.
- The boundaries of this envelope are now well defined, and must be taken into account in the design of systems, equipment and operational procedures
- Human error can be moderated but never eliminated
- Systems must be designed to be error tolerant

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Building the vehicle for our journey to zero harm

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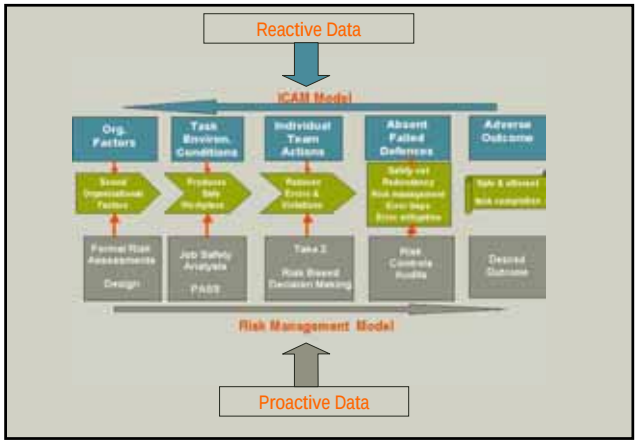

Safety data sources

Reactive data sources	Proactive data sources
• Accident investigation	• Risk assessments
• Hazard reports	• Audits
• Regulatory citations	• Safe act observations
• Audit non-compliance reports	• Inspections
• Equipment damage reports	• Equipment recorder output
• Production delays and equipment unavailability	• Workforce feedback

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Proactive safety strategy

We need :

- A comprehensive safety information database
- To identify the “root causes” of errors
- To modify “at risk” behaviours
- To address organisational factors which promote errors
- To develop a method for real-time monitoring and continual improvement of operational safety

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Use collected data for strategic intervention

- Accumulated records in a common database
- Provide a common classification scheme of organisational factors
- Periodically report “top” safety problems to promote targeted interventions
- Trend safety levels to show improvements and areas of opportunity

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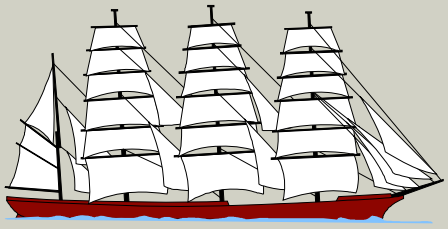
S.H.I.P.



Safety. Health. Indicator. Process.

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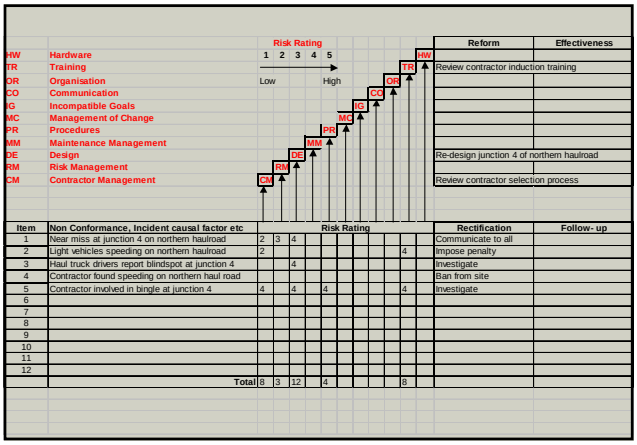
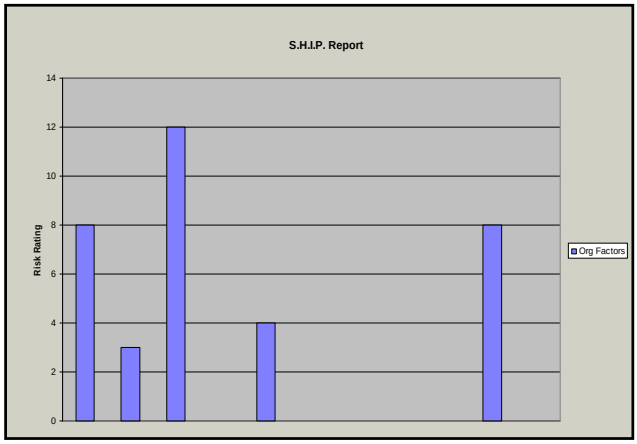


Item	Non Conformance, Incident causal factor etc	Risk Rating	Rectification	Follow- up
1	Near miss at junction 4 on northern haulroad	2 3 4	Communicate to all	
2	Light vehicles speeding on northern haulroad	2 4	Impose penalty	
3	Haul truck drivers report blindspot at junction 4	4	Investigate	
4	Contractor found speeding on northern haul road		Ban from site	
5	Contractor involved in bingle at junction 4	4 4 4 4	Investigate	
6				
7				
8				
9				
10				
11				
12				
	Total	8 3 12 4 8		



The benefits of proactive safety

"Hard" or "Tangible"

- Share price
- Reduced equipment damage
- Fewer on the job injuries
- Reduction of delays to planned events
- Fewer / less costly fines
- Reduced workers comp claims
- Increased equipment availability
- Reduced replacement, repair and maintenance costs

"Soft" or "In-Tangible"

- Increased communication
- Increased morale
- Reduced IR issues
- Increased job satisfaction
- Improved teamwork
- Increased occurrence reporting
- Industry and community perception
- Shareholder perception

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The bottom line of safety

In a competitive market :

- Without sustained profit, the organisation has no future.
- Profit can not be sustained without efficiency,
- Efficiency can not be sustained without safety.
- Safety is therefore a core management issue.

"Inefficiencies, or other words such as failures, losses, accidents, incidents and injuries are all used to describe events that have two common features: they are unplanned, and they disrupt the flow of revenues but allow the expenses to continue……removing unplanned events liberates capital and operating resources"

(Prof. Jose Blanco U of T)

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