US Chemical Safety Board
BP Macondo Report, June 5th 2014
WHAT WILL I COVER?

+ What are the characteristics of disasters?

+ Common errors in managing catastrophic hazards (low probability, high consequences)

+ Suggest some practical steps we can take

+ But 1st - what have other industries learnt from mining?
Characteristics of Disasters

+ Rare – but what does this mean?
  • Outside of our personal experience - hopefully?

  • Absence of incidents assumed to be evidence of effective risk controls – possibly!

  • Complexity – no one *root* cause. Usually a combination of unsatisfactory circumstances in equipment, processes and systems and people

  • Disasters come as a great surprise (to some) – but are there warning signs?
Common errors which make major disasters more likely

+ Insufficient focus on the potential disaster – greater focus on *personal safety*
+ Incident Causation – simplistic view of human error
+ Lack of clarity in our prevention strategy – insufficient focus on “barriers” or controls.
+ Learning – we identify the lessons *to be learnt* rather than applying the lessons effectively
Common errors - 1

Comparative lack of focus on the Catastrophic Hazards

+ Mumbai High disaster 2005 (below)

+ BP Macondo 2010 – slips/trips vs blowouts
Common errors – 2
Our focus is stronger on personal safety

+ Our measures of safety eg injury frequency rates (LTIs) have little or no correlation with catastrophic hazards

+ We need measures which help us understand the strengths and weaknesses of our risk controls or barriers eg:
  
  • What is it that prevents us having a coal dust explosion and measure those things

+ Other weaknesses of LTI rates:
  
  • Do not address many occupational health issues
  • Susceptible to manipulation
Common errors - 3
Simplistic view on human error

+ Allegedly 80% of all accidents are caused by human error
+ Safety moments – cutting the grass or hedge!
+ But modern accident causation models show we need failures in or by:
  • Individuals (and not just “front line workers”)
  • Systems and processes
  • Engineering (eg cementing of well completion tubing) Macondo and Montara
Common Errors – 3
Human error is not an explanation!

Human and Organisational, factors

Technical equipment, hardware failure

System, process, procedure failure
Common errors - 4
Lack of focus on “barriers” or controls
What are the implications of the Swiss Cheese model?

- All barriers have gaps or weaknesses – perfection is rare.
- But risks do not eventuate most of the time because it is stopped by the redundancy in the defences.
- But the absence of incidents is not the same as having effective controls!
- We need to identify the gaps in the barriers.
Common errors - 5

“Why corporations have no memory and accidents recur”.

+ Rarity of major incidents means:
  - They are (mostly) outside of our experience – therefore an active learning strategy needed. This is more than identifying the lessons to be learnt
  - To be learnt, the lessons must be implemented and actions/behaviours changed
  - We are subject to a variety of cognitive biases eg the Availability Heuristic and the use of risk assessment and risk matrices
So what can we do?

+ Recognising the potential for a major accident
+ If we handle flammable, explosive, or hazardous substances – what is the worst foreseeable event (it has already happened to someone)?
+ What is the global experience – they are rare so unlikely to have personal experience
+ Human error is inevitable – by people in all parts of our organisations – not just at the front line.
  
  • How effective is BBS in relation to mine design?
A Focus on Barriers or Controls

+ Questions we should ask about Critical Controls:
  • Have they identified all their *critical controls* – both preventative and mitigating controls?
  • Who is the “owner” of these controls?
  • Do they know how “healthy” the control is?
  • How do they know? (Few controls are perfect!)
  • Do they carry out “active monitoring?”
  • Are the results reported in the same way as important production data?
+ Swiss Cheese Model in action

+ Identify and specify the barriers (with workforce) – record using bowties

+ Identify checks for each barrier and accountabilities

+ Carry out the checks on “health” of barriers
PTTEP Australasia 2009
Montara – Ignited blowout
PTTEP Australasia
Line of Sight (LoS) Tool

+ Currently in use
+ Provides details on “health” of barriers to all levels of management
+ Status of barriers recorded and reported via IT system and displayed on computer screens
+ Company supervisors and contractors report no significant additional burden
+ Much greater transparency on the barriers to catastrophic events
Conclusions (Action Required)

+ We need to do more to brief Senior Managers and Boards on how Major Risks eventuate.
+ Implement “monitoring” strategies (not just metrics) for all the barriers or controls
+ Report results of barrier or control monitoring to leadership teams (in the same way and in same meetings as other important data)
+ Create a climate in which bad news gets reported – you cannot manage what you don’t know!
Some Key Questions

+ Can you explain the Swiss cheese model to a supervisor, your team and the Board?
+ Are your metrics appropriate to the hazards?
+ Do you have reporting to the top team on the “health” of MAE controls?
+ Have you institutionalised learning on low probability/high consequence risks?
The End