Better Practice Mine Safety Regulation

Kym Bills

Keynote Speech QMIHS Conference 2011

"Embracing the Age: supporting people and technology"

ATSB Investigations

Locus Standi

- Executive roles in safety and systemic investigation including regulation since ’94
- Board memberships ANL, AMSA, NOPSA
- Foundation head of the ATSB 1999-2009
- Chair National Road Safety Cttee ’99-2008
- Varanus Island explosion investigation & offshore petroleum regulatory inquiry 2009
- NMSF Project Director Nov ’09-19 Aug ’11
- CEO WA:ERA from 29 August 2011

Overview of presentation

- Rationale for mine safety regulation
- Lessons from ATSB safety investigations
- Some learnings from Victorian Bushfires, GFC, Gulf of Mexico and Montara
- NMSF, the model WHS Act, core & non-core mine safety legislation and regulation

Overview of presentation

- Robens & Stakeholder impediments
- Better Practice Regulation
- Desirable next steps for mine safety

Why regulate mine safety?

Reasons include:

- Social licence to operate
- High hazard dynamic risk environment
- Not all operators best practice – ‘cowboys’
- Community and workforce expectations
- Market failure and ‘normalised deviance’
- ILO Convention 176
- Additional protection for workers
- Hard-won lessons of history

Australian Mining Disasters >10 lives

- 1887 NSW Bulli, 81 lives
- 1889 NSW near Newcastle, 11 lives
- 1902 NSW Mt Kembla, 96 lives
- 1912 TAS North Mt Lyell, 42 lives
- 1921 QLD Mount Mulligan, 77 lives
- 1972 QLD Box Flat No. 7, 18 lives
- 1975 QLD Kianga No. 1, 13 lives
- 1979 NSW Appin, Illawarra, 14 lives
- 1986 QLD Moura No. 4, 12 lives
- 1996 QLD Moura No. 2, 11 lives

Mining tragedies still happen

- 2000-10: no major Aust. event but still 111 deaths + many more serious injuries
- Thousands die annually around the world (eg India, China, Africa, Latin America)
- US Upper Big Branch Coal Mine, West Virginia, 29 dead, April 2010
- NZ Pike River Coal Mine, near Greymouth, 29 dead, Nov 2010

Pike River Royal Commissioners (Stewart Bell, QLD, on left)

Lessons from other sectors

Every industry considers itself unique but many commonalities

- Operator role/Safety Management System
- Safety culture and risk appetite
- Technology, Human, Orgn, Env interfaces
- Worker competency/human perf. limits
- Scope and quality of regulations
- Competence and resourcing of regulator

Lessons from ATSB investigations

- Embracing the Age – not wishing away hazards, risk, complexity, technology or human and organisational factors
- Supporting people BY technology AND systems is critical
  - three ATSB examples covering marine, rail and aviation from Northern QLD

Malu Sara 15 October 2005, 5 dead


01.12.2005

Marine Safety: Malu Sara

6 basics addressing operational risk:

- Risk factors identified?
- Equipment in use fit for purpose?
- Safe systems and procedures?
- Personnel fit/competent/effective?
- Emergency procedures/defenses?
- Performance monitoring system?

***Malu Sara* failed in each**

Cairns Tilt Train, 15 November 2004

Rail Safety: Tilt Train

- Derailment via excessive speed
- Safety required two-driver presence, route knowledge and competency
- Driver likely disorientated/distracted during other's absence taking a break
- Darkness may have contributed to a loss of route situational awareness
- No technical system on tilt train to detect short periods of driver inactivity
- No Automatic Train Protection system operating to reduce risk of human error

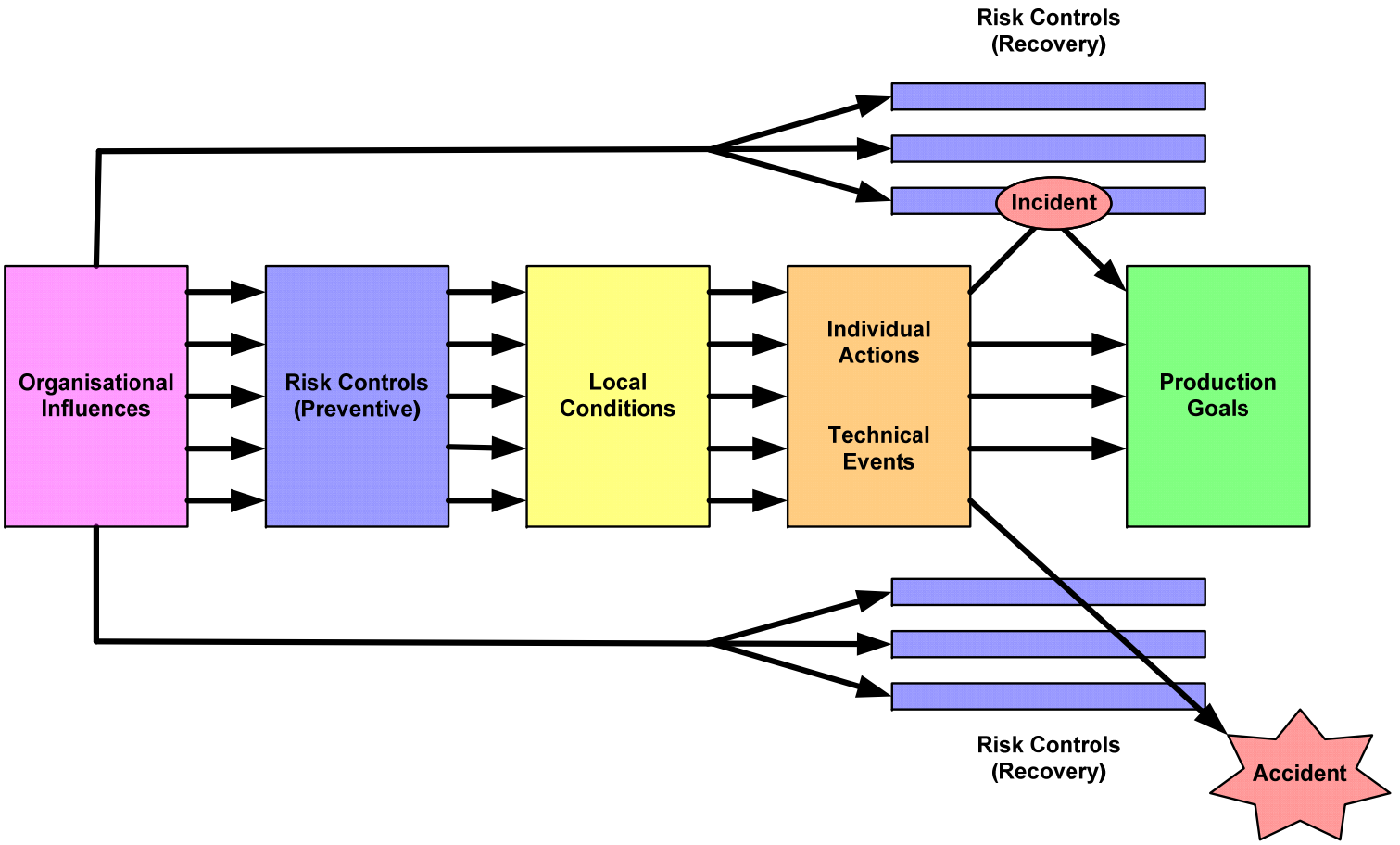
Australian Government
Australian Transport Safety Bureau

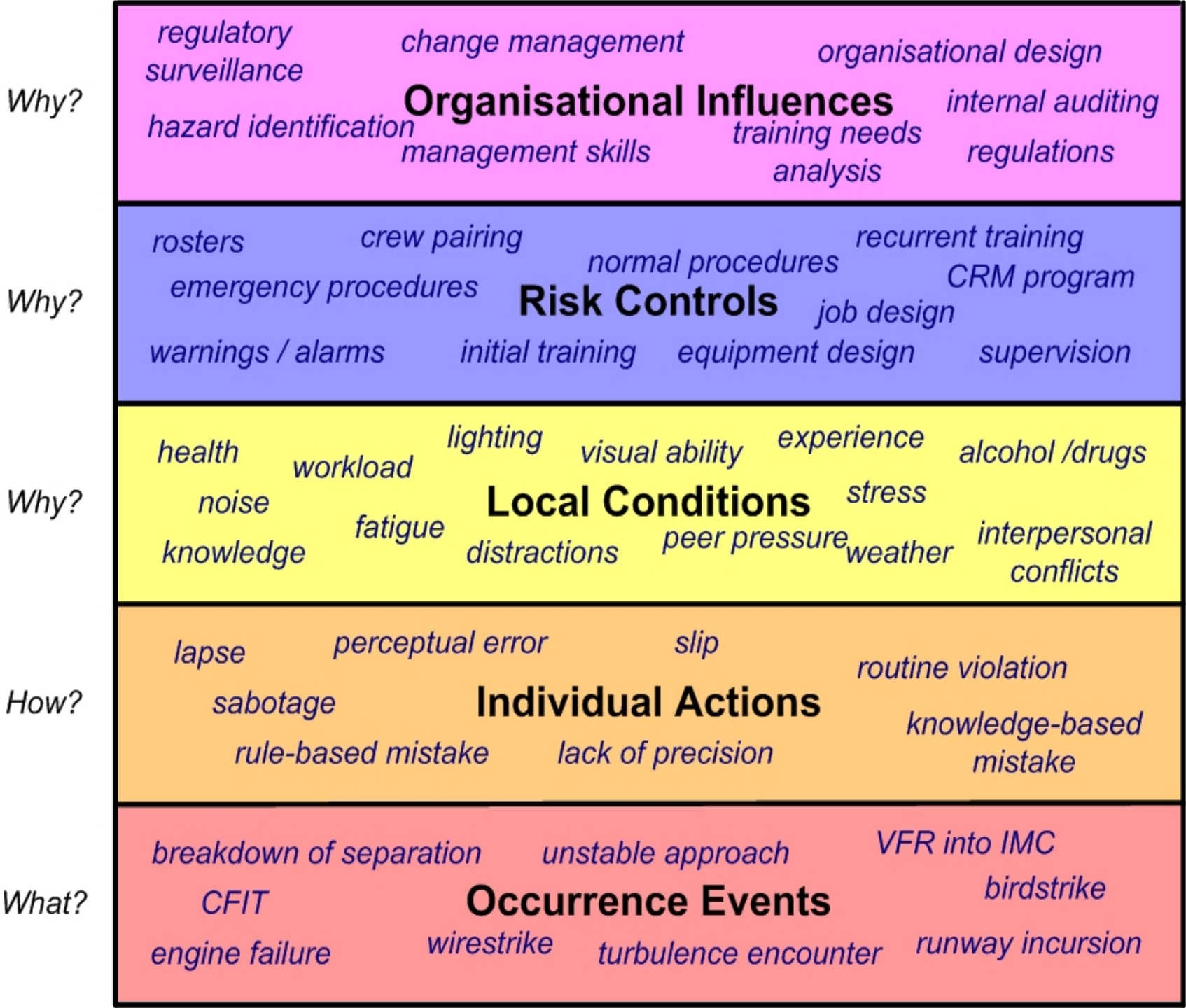
Safety Investigation
200501977

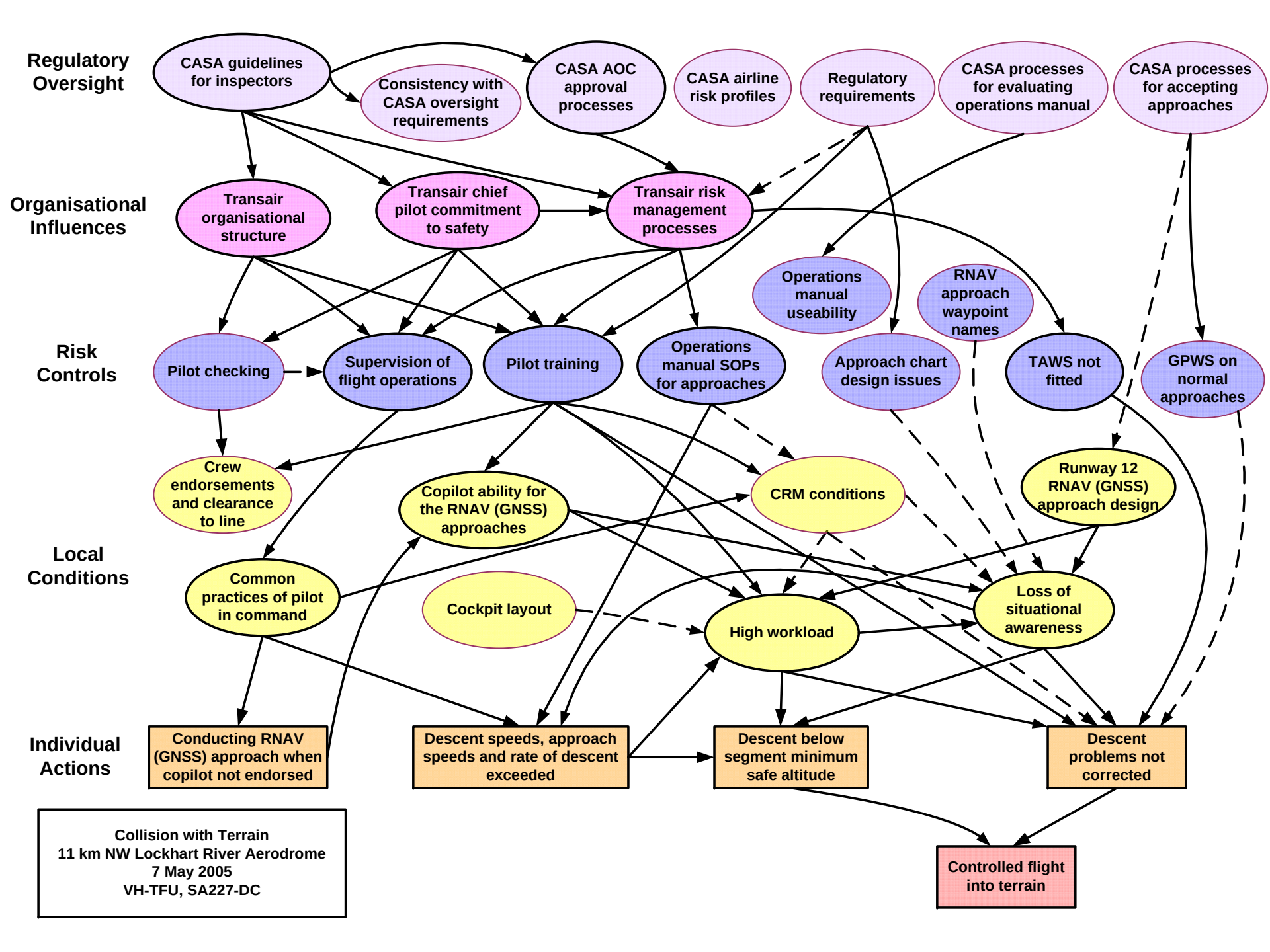
Collision with Terrain
11 km NW Lockhart River Aerodrome
7 May 2005, RPT 2 crew/13 passenger fatalities
VH-TFU, SA227-DC (Metro)


South Pap
Accident site

ATSB investigation analysis model




Why?
regulatory surveillance
change management
organisational design
Organisational Influences
hazard identification
internal auditing
training needs analysis
management skills
regulations
Why?
rosters
crew pairing
recurrent training
normal procedures
CRM program
emergency procedures
Risk Controls
job design
warnings / alarms
initial training
equipment design
supervision
Why?
health
lighting
visual ability
experience
alcohol /drugs
workload
noise
Local Conditions
stress
fatigue
knowledge
distractions
peer pressure
weather
interpersonal conflicts
How?
lapse
perceptual error
slip
routine violation
sabotage
Individual Actions
knowledge-based mistake
rule-based mistake
lack of precision
What?
breakdown of separation
unstable approach
VFR into IMC
CFIT
Occurrence Events
birdstrike
engine failure
wirestrike
turbulence encounter
runway incursion


Regulatory Oversight
Organisational Influences
Risk Controls
Local Conditions
Individual Actions
CASA guidelines for inspectors
Consistency with CASA oversight requirements
CASA AOC approval processes
CASA airline risk profiles
Regulatory requirements
CASA processes for evaluating operations manual
CASA processes for accepting approaches
Transair organisational structure
Transair chief pilot commitment to safety
Transair risk management processes
Operations manual useability
RNAV approach waypoint names
Pilot checking
Supervision of flight operations
Pilot training
Operations manual SOPs for approaches
Approach chart design issues
TAWS not fitted
GPWS on normal approaches
Crew endorsements and clearance to line
Copilot ability for the RNAV (GNSS) approaches
CRM conditions
Runway 12 RNAV (GNSS) approach design
Common practices of pilot in command
Cockpit layout
High workload
Loss of situational awareness
Conducting RNAV (GNSS) approach when copilot not endorsed
Descent speeds, approach speeds and rate of descent exceeded
Descent below segment minimum safe altitude
Descent problems not corrected
Collision with Terrain
11 km NW Lockhart River Aerodrome
7 May 2005
VH-TFU, SA227-DC
Controlled flight into terrain

Acci-map & ICAO SMS

- ATSB ‘Acci-map’ diagram in previous slide shows 19 contributing safety factors (black border P>66%) and 13 other safety factors (purple outline)
- ICAO SMS material = helpful reference
- To support people by technology requires integrated systemic approach with multiple barriers and defences including competency assurance

Vic 7/2/09, 173 dead, $4b

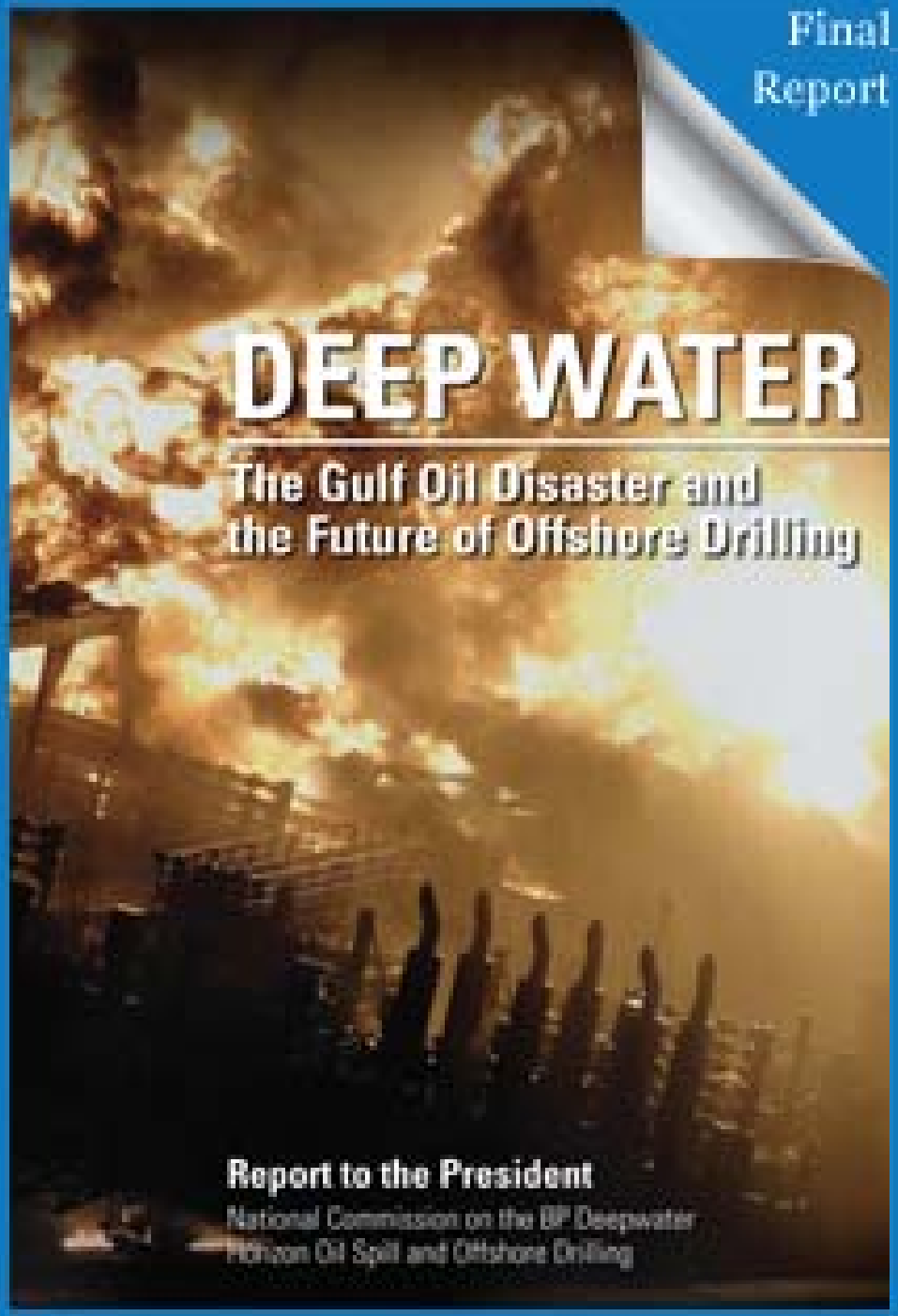
Vic Bushfires Royal Commission

Commission re incident controllers:
“there are important differences between the DSE system of accreditation (which involves formal assessment of a candidate against known criteria) and the CFA system of endorsement (involving the nomination or approval of a person to perform a particular role)”

GFC and Risk Appetite

- The global financial crisis has renewed attention upon the adequacy of financial regulation and regulator capability because of moral hazard and institutional failure
- Specifying internal ‘risk appetite’ in banks and other financial institutions important
- Pervasiveness and centrality of culture (Lawrence ’11)

US National Commission Reports



2011 US National Commission

The Commission found that:

"Absent major crises, and given the remarkable financial returns available from deepwater reserves, the business culture succumbed to a false sense of security. The Deepwater Horizon disaster exhibits the costs of a culture of complacency … recurring themes of missed warning signals, failure to share information, and a general lack of appreciation for the risks involved … highlight the importance of organizational culture and a consistent commitment to safety by industry, from the highest management levels on down" (p ix).

2011 US National Commission

- [The regulator] *"MMS became an agency systematically lacking the resources, technical training, or experience in petroleum engineering that is absolutely critical to ensuring that offshore drilling is being conducted in a safe and responsible manner"* (p 57)
- MMS had internal conflicts of interest and a lack of robust legislation (eg re SEMS and incident reporting that the industry association opposed).

As a result of our investigation, we conclude:

"that without effective government oversight, the offshore oil and gas industry will not adequately reduce the risk of accidents, nor prepare effectively to respond in emergencies. However, government oversight, alone, cannot reduce those risks to the full extent possible … [it] must be accompanied by the oil and gas industry's internal reinvention: sweeping reforms that accomplish no less than a fundamental transformation of its safety culture" (p 217)

2011 US National Commission

"the American Petroleum Institute (API) … ability to serve as a reliable standard-setter for drilling safety is compromised by its role as the industry's principal lobbyist and public policy advocate. Because they would make oil and gas industry operations potentially more costly, API regularly resists agency rulemakings that government regulators believe would make those operations safer, and API favors rulemaking that promotes industry autonomy from government oversight" (p 225)

Macondo/Deepwater Horizon 2010, 11 dead

2011 DHSG Macondo Report

Deepwater Horizon Study Group:
“Analysis of the available evidence indicates that when given the opportunity to save time and money – and make money – tradeoffs were made for the certain thing – production – because there were perceived to be no downsides associated with the uncertain thing – failure caused by the lack of sufficient protection.” (p5)

2011 DHSG Macondo Report

“The system was not reflective of one having well-informed, reporting, or just cultures. The system showed little evidence of being a high-reliability organization possessing a rapid learning culture that had the willingness and competence to draw the right conclusions from the system’s safety signals. The Macondo well disaster was an organizational accident whose roots were deeply embedded in gross imbalances between the system’s provisions for production and those for protection.” (p9)

Montara

21 August 2009
(photo from
Java Constructor)

1 November 2009

4 November 2009

Montara & Australia

- Montara blowout similar to later Macondo technically & causal factors more broadly
- Multiple players, poor communication, and weak coordination & risk management
- Privilege of safety case regime requires operators to be responsible in utilising good oilfield practice +robust safety culture
- Also weak and underfunded regulator (NT)

2009 NOPSA Review

- Before these reports, David Agostini and I produced a 200+ page report on better regulatory practice based on NOPSA
- Highlighted importance of safety culture
- Supported operator primary safety role (eg SMS) but with competent, well-resourced regulator using a risk matrix for targeting
- Not averse to some absolute requirements

NMSF Strategies approved by MCMPR & COAG

National Mine Safety Framework (NMSF)

- MCMPR Initiative: tripartite Steering Group
- Key goal of safe, efficient, nationally consistent legislation
- Integrated Work Health and Safety Management System (WHSMS) approach
- Hazard ID and risk management central

NMSF Challenges

- Differing Philosophies, ideologies & vision
- History of major events that shaped state legislation and comfort with status quo
- Parallel process for general Work Health and Safety legislation/regulation

NMSF Challenges

- MCMPR signed off on core Drafting Instructions on 28 May 2010
- ‘Core’ Jurisdictions: Vic, SA, NT, ACT, (Tas) utilise Ch. 9 WHS Mine Regulations
- Safe Work Australia on 15/7/11 released draft core Ch.9 mine safety regulations -public comment by 9 September 2011

Hybrid Approach

- MCMPR agreed the non-core could build on the core for high risk mining, esp. underground coal
- ‘Non-Core’ Jurisdictions: QLD, WA, NSW
- Core picks up the model Work Health and Safety Act framework, duties qualified by ‘reasonably practicable’ & other WHS regs
- Non-core adds via separate legislation

Core Regulations – key features

- appointment of PCBU ‘mine operators’
- overarching risk management and WHS management systems for mines
- principal mining hazard management plans for ‘principal mining hazards’ (ie multiple fatality hazards, low probability)
- emergency response plans
- management of ‘fitness for work’ issues

Core Regulations – key features

- health monitoring of workers at mines
- specific consultation provisions
- provisions concerning information, instruction & training for workers & others
- data collection on certain work health and safety matters (national dataset), and
- mine survey plans and mine records
- Codes of Practice (16 identified so far)

Non-core developments

Non-core Ministers considered DIs on 19/8 plus IGA for ongoing consistency:

- appointment of site senior executive (SSE)
- FT/PT statutory mine safety positions depending on mine type and hazards
- consistent tri-state competency assessment and approvals/certificates for key statutory positions
- principal control plans:ventilation, electrical engineering, mechanical engineering, explosives,emergency response

Non-core features

- spontaneous combustion principal mine hazard
- additional specific controls for coal etc hazards
- Notification, not approval, requirements for prescribed high-risk mining activities, including information requirements and waiting periods

Non-core features

- extended incident notification, investigation and protected information release provisions
- extra pro-active regulator enforcement powers
- Ministerial-initiated Inquiry Boards
- Each jurisdiction will consult with stakeholders as it develops legislation/regulations (and RIS work)

Stakeholder issues

- MCA opposed having much detail in the Core and sought minimalist regulation plus Codes (with guidance seen as even better)
  - argued employers would all do right thing
  - big difference from aviation, road safety...
  - cf Robens & history including Pike River
- NSWMC formally took a similar position stating that safety is industry's top priority (but also sensibly helped develop non-core)
- Really dual priorities- safety & profit/viability

Robens light-touch Regulation

Lord Robens also states (paras 134 & 148): *“We are not advocating a slacker approach. On the contrary, elsewhere in this report we indicate areas where statutory provision is inadequate and should be tightened … the whole system … should encourage industry to deal with its own problems, thereby allowing official regulation to be more effectively concentrated on serious problems where strict official regulation is appropriate and necessary.”*

(UK HSE mandatory provisions since 1972)

Stakeholder issues

- WA CME & CCAA somewhere between Ch.9 and non-core, perhaps a bit like Tas
- QRC in 2010 argued light touch/no SSE
- QRC now and CFMEU argue no change to current QLD legislation/ regulation
- While not diminishing safety is critical, it would be a great shame if stakeholder issues stymie national mine safety reform
- Surely 36 years of waiting is long enough?

Reform a long time coming

"The Kianga Inquiry of 1975 recommended that Queensland and NSW coal mine safety legislation be standardised. Progress … glacial…. Learning and applying different legislation intended to manage the same hazards must be seen as unnecessarily wasteful … [and] a hazard source of itself … There is a need for common legislation, finally, to be progressed into existence and at the Federal level if that is what it takes." F. Windridge - Moura No.2 Warden's Inquiry, 1996, p 75

Better Practice Regulation

- Clear and sound legislation, regulations and codes that ensure minimum standards but also foster better practice based on ALARP
- Legislative consistency and harmonisation to assist operators and the movement of workers
- Primary operator safety duty (+ non-core SSE)

Better Practice Regulation

- WHSMS framework, using well-known controls, risk assess other hazards, outcomes focus
  - not unthinking ‘box ticking’ compliance
- Contractor integration into one mine WHSMS
- Capable and well-resourced regulator using risk matrix and hierarchy of tools, fairly applied

Desirable mine safety next steps

- Enact WHS mining regulations but delay commencement to allow solid preparation for both industry and regulators
- Mirror WHS in consistent QLD, WA, NSW legislation, including additional material for high risk mining such as underground coal

Desirable mine safety next steps

- Ensure these largest 3 mining states continue to have competent, well-resourced regulators and support levies for other jurisdictions to improve
- Regulators to base interventions on risk (including history) with responsive compliance & enforcement tools (n.b. see VET Regulator Act 2011)

Desirable mine safety next steps

- Move beyond narrow stakeholder issues
- Deal with industry lobbyist/safety conflicts
- Increase focus on SMS and safety culture
- Foster required operator, officer and worker competencies
- No diminution of safety

Desirable mine safety next steps

- Be explicit re risk appetite
- Better open incident reporting & shared understanding of human & organisational factors (Reason ’08)
- Use technology and good systems to support people and reduce error consequences.

Key sources

- www.ret.gov.au/resources/mining/framework/Pages/default.aspx (re NMSF)
- http://www.safeworkaustralia.gov.au/Legislation/PublicComment/Pages/PublicComment.aspx (Ch.9 Mine Regs)
- http://pikeriver.royalcommission.govt.nz (re Pike River)
- http://www.msha.gov/performancecoal/performancecoal.asp (re Upper Big Branch)
- http://www.dmp.wa.gov.au/documents/Reports/MI_Act_KennerReport.pdf (WA 2009 Kenner mine safety report)
- www.atsb.gov.au (for Transair & all other ATSB reports)
- www.royalcommission.vic.gov.au (VIC Bushfires reports)
- www.oilspillcommission.gov National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (2011 Report to President; 2011 Chief Counsel's Report)

Key sources

- http://ccrm.berkeley.edu/pdfs_papers/bea_pdfs/DHSGFinalReport-March2011-tag.pdf (DHSG Macondo Report)
- www.ret.gov.au/Department/Documents/MIR/Montara-Report.pdf (Montara 2010 Report & Aus Govt Response)
- www.ret.gov.au/resources/Documents/Offshore%20Petroleum%20Safety/NOPSA%20Safety%20Authority_Web.pdf (Bills & Agostini NOPSA 2009 Report & Aus Govt Response)
- http://www.icao.int/anb/safetymanagement/DOC_9859_FULL_EN.pdf (re ICAO SMS)
- http://www.apec.org.au/docs/11_CON_GFC/HTRAB_040-043_Lawrence.pdf (GFC, bank culture & risk appetite)
- James Reason, The Human Contribution: Unsafe Acts, Accidents and Heroic Recoveries, Ashgate, 2008

Garuda 737-400 runway overshoot, 7/3/07, 22 dead … Complacency can kill