REGULATORY RELATIONS, CULTURE AND SAFETY

Rob Burrows

Australian Railways

164 Rail Operators
43,300 Km track
198M Train kilometres

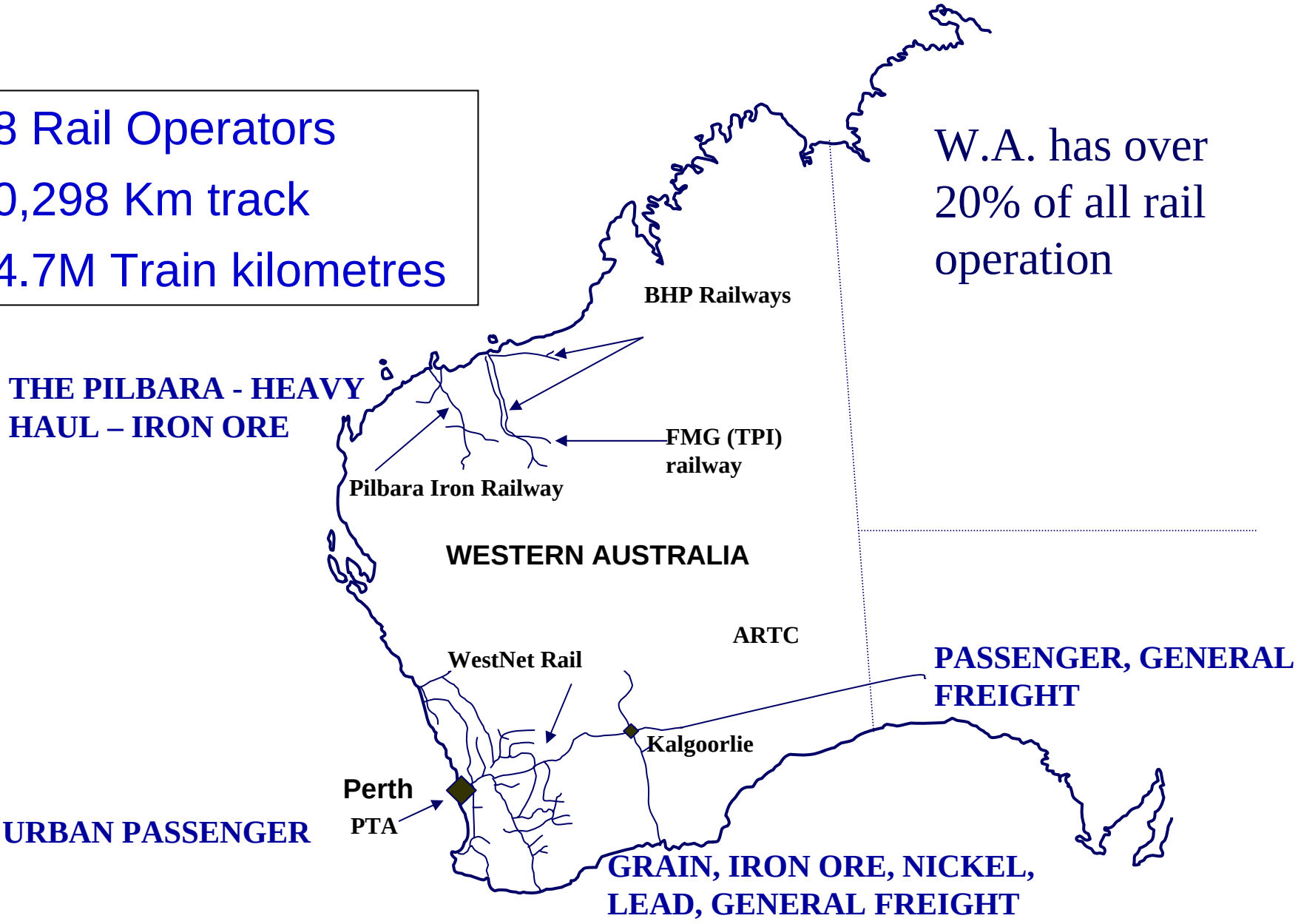
Railways in Western Australia.

28 Rail Operators

10,298 Km track

44.7M Train kilometres

W.A. has over 20% of all rail operation



RAILWAY SAFETY REGULATION

Small tourist

RAILWAY SAFETY REGULATION

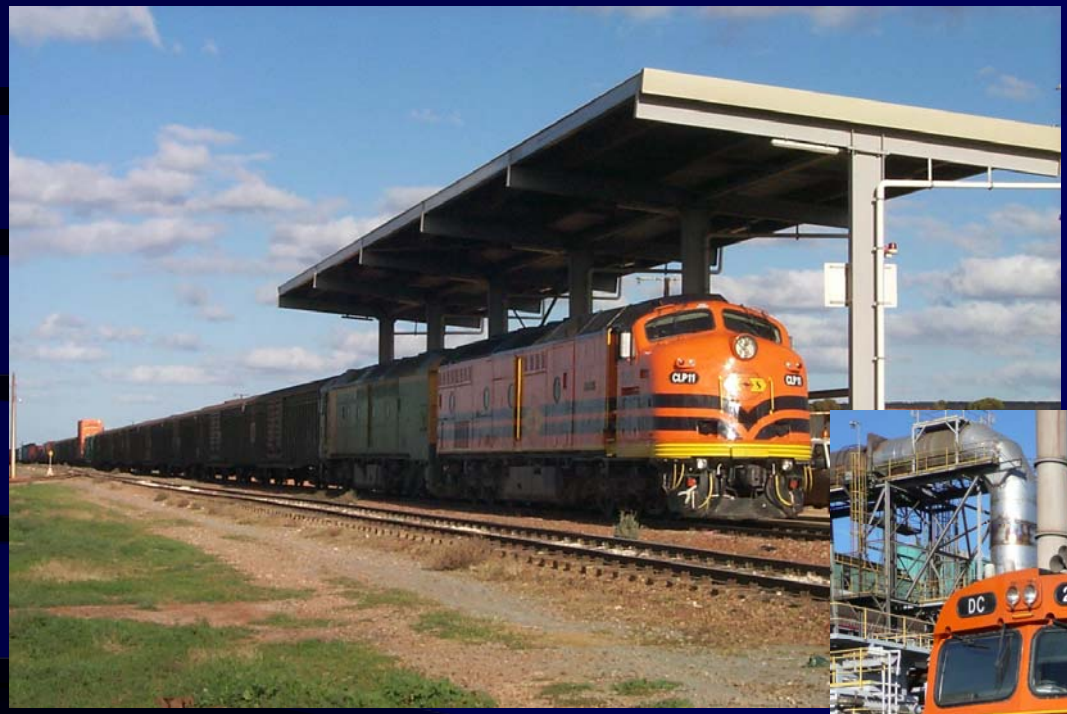
Heritage – electric trams and steam trains

RAILWAY SAFETY REGULATION

Passenger – metro and country

RAILWAY SAFETY REGULATION

General freight



RAILWAY SAFETY REGULATION

Heavy haul – Pilbara iron ore

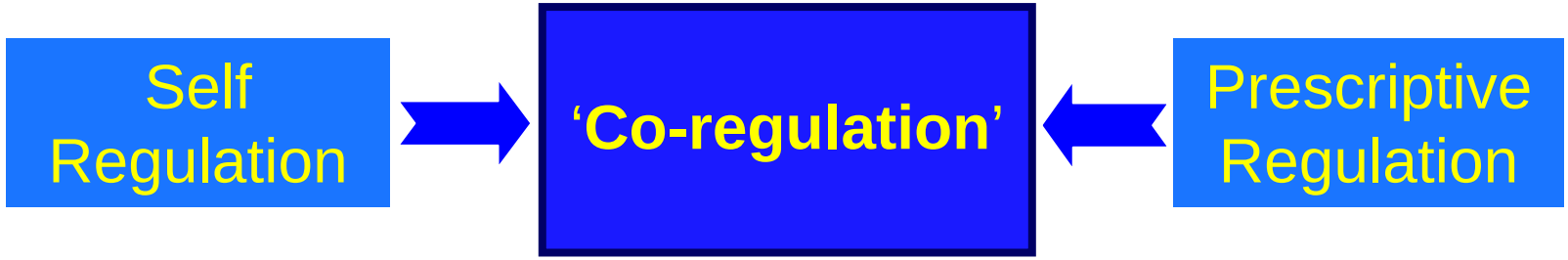
RAILWAY SAFETY REGULATION

Fair grounds …..- we don't Regulate these

RAILWAY SAFETY REGULATION

Co-regulation model

The Regulatory Spectrum



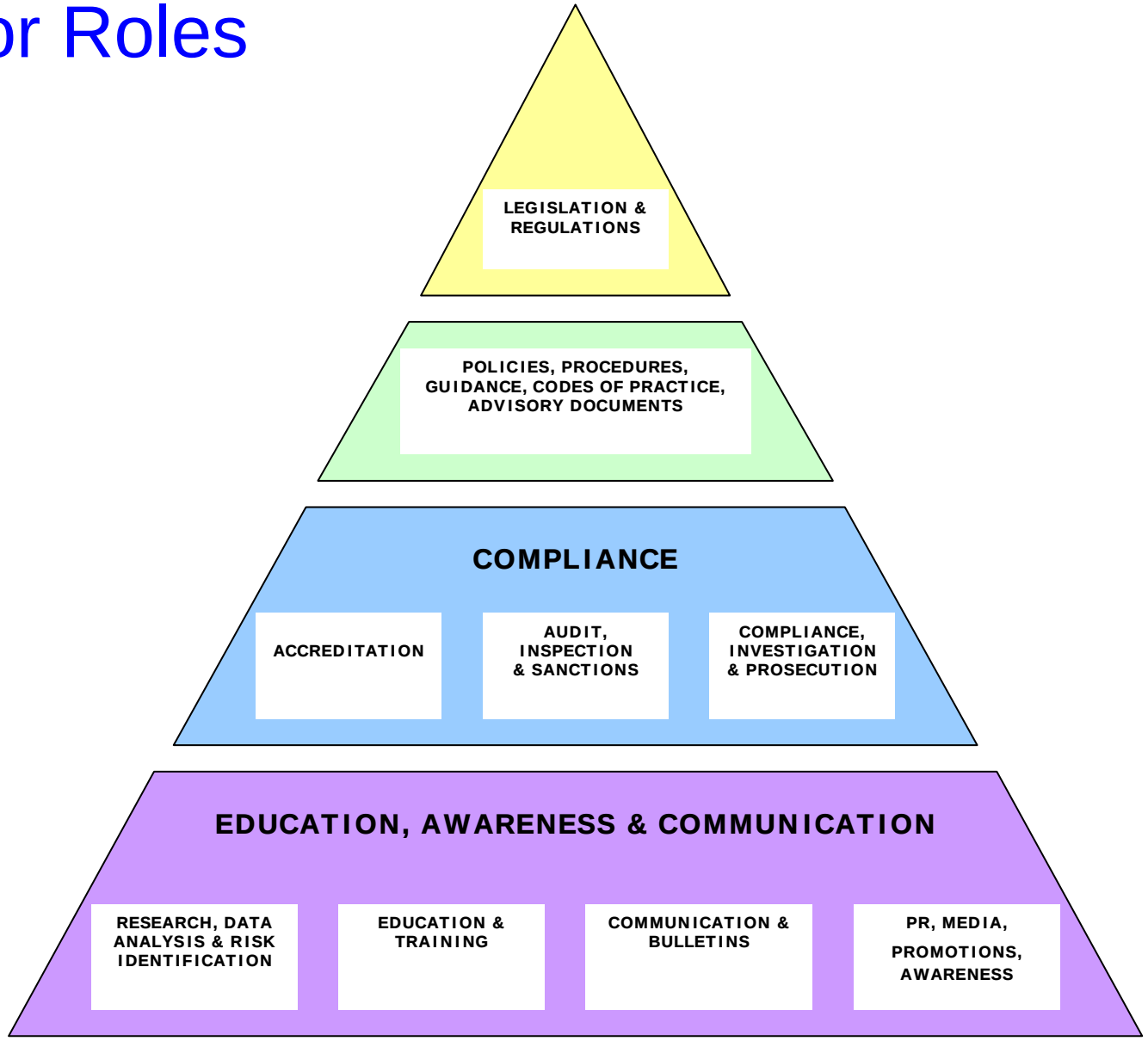
Rail operators sets standards, guidelines, codes and rules, and enforces them

Regulations are specified, administered and enforced by differing interactions between **Government and operators**

Government sets standards, guidelines, codes and rules, and enforces them

RAILWAY SAFETY REGULATION

Regulator Roles



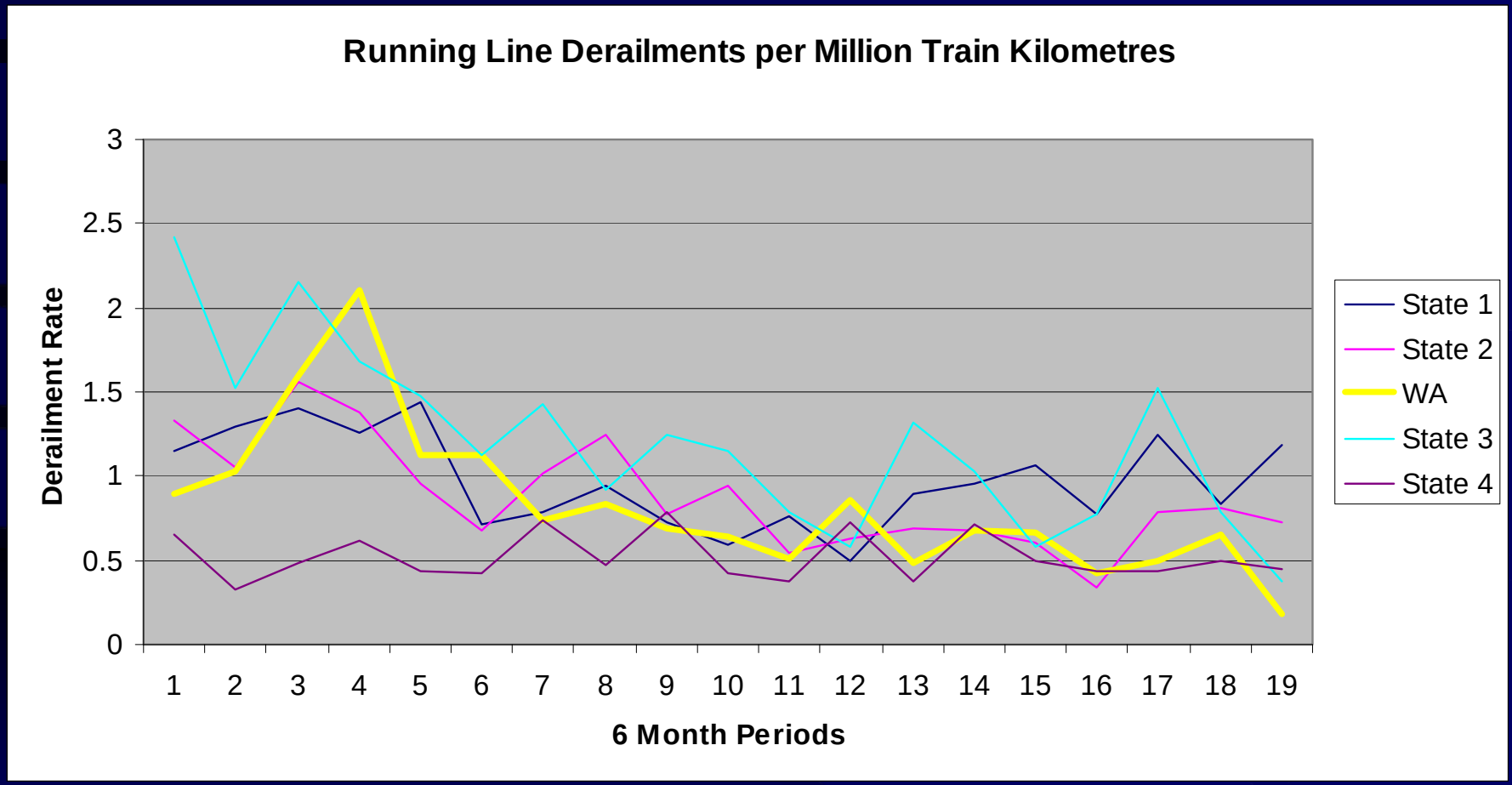
RAILWAY SAFETY REGULATION

Reportable Occurrence Categories

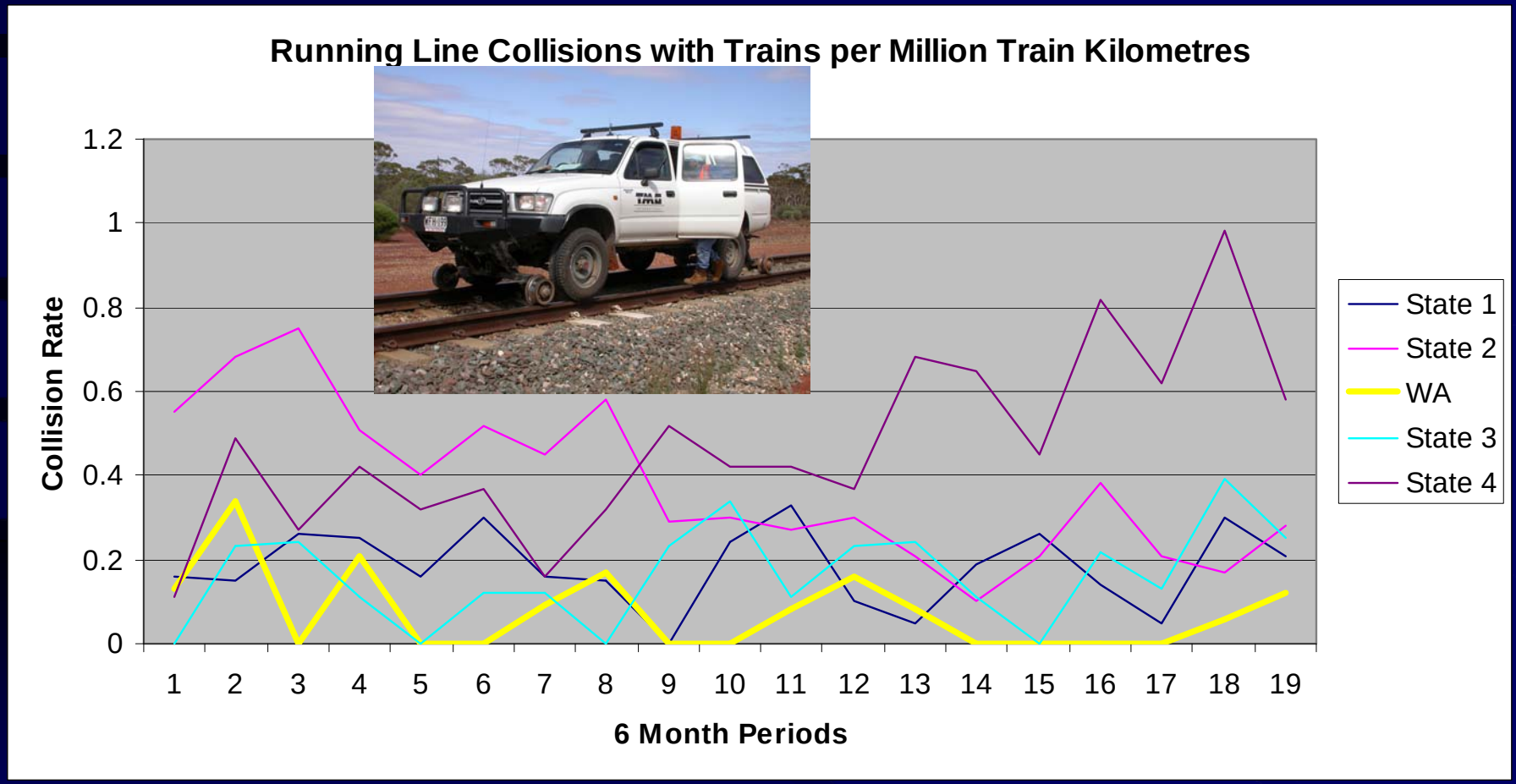
1. Collision
2. Derailment
3. Level Crossing
4. Signal Passed at Danger
5. Proceed Authority Exceeded
6. Safeworking Irregularity
7. Rolling Stock Irregularity
8. Load Irregularity
9. Dangerous Goods Irregularity
10. Runaway
11. Track and Civil Infrastructure Irregularity
12. Signalling System Irregularity
13. Electrical Infrastructure Irregularity
14. Train Warning and Enforcement System Irregularity
15. Communication System Failure
16. Fire
17. Explosion
18. Slip, Trip or Fall
19. Suspected or Attempted Suicide
20. Alcohol or Drug Irregularity
21. Railway Network Security

RAILWAY SAFETY REGULATION

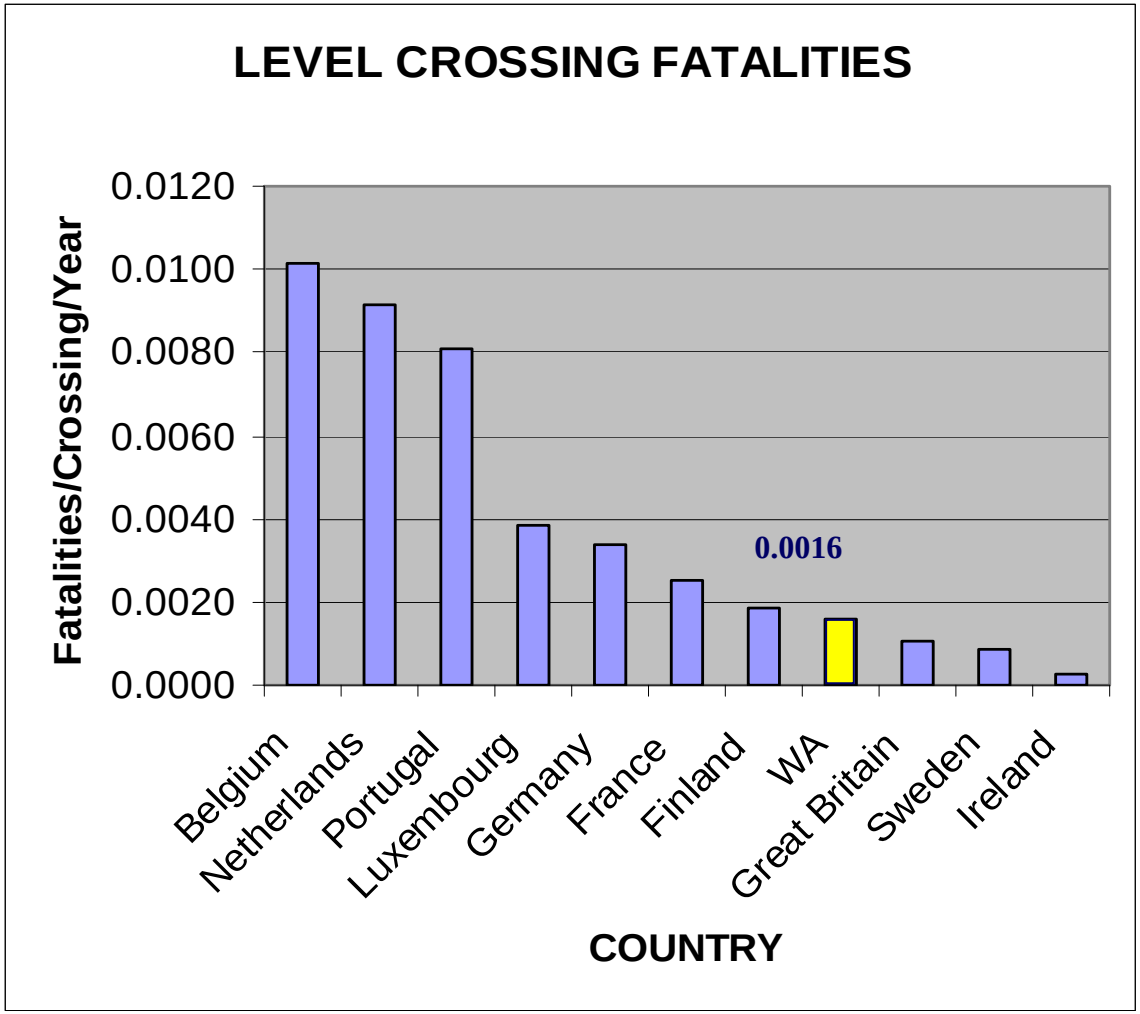
Regulator Roles



RAILWAY SAFETY REGULATION



RAILWAY SAFETY REGULATION



European data source: RSSB

RAILWAY SAFETY REGULATION

KEY TOOLS IN OUR STRATEGY

Rail operators:-

- Need an SMS before permission to operate.
- Need their SMS to meet Australian Standard AS4292 – Rail safety management
- Define their own **standards, codes and guidelines** for safe practice.

Regulators encouraged:-

- Best practice
- Sharing of knowledge across industry.

SAFETY LESSONS

Safety improvement came from:

- audits (internal and by Regulator);
- SMS reviews; and
- lessons from accidents (local and international in all industries).

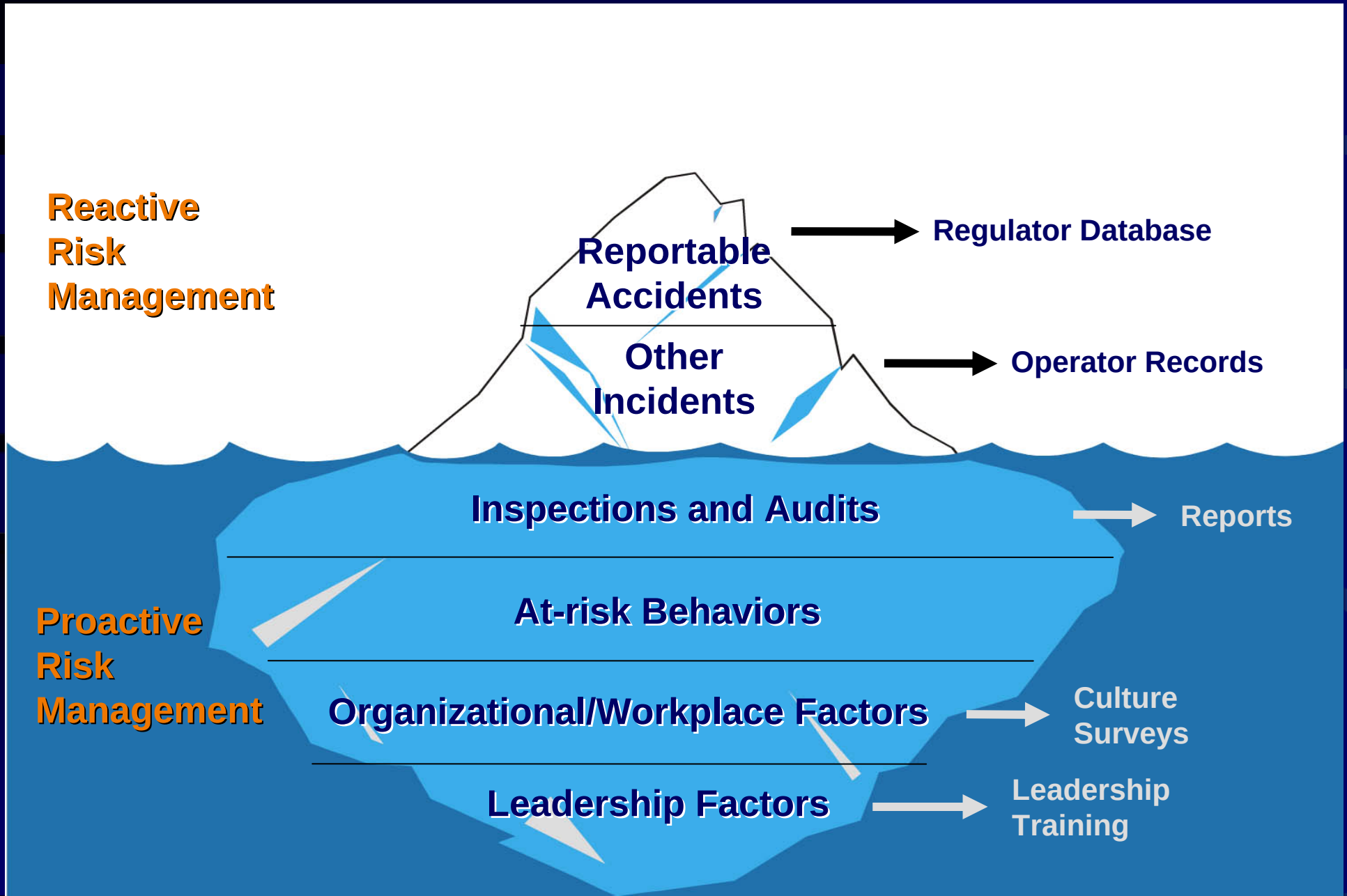
KEY ELEMENTS IN OUR STRATEGY

- The SMS provides a **systematic approach to safety**
- To meet requirements Management of an SMS could be a mechanical asset and paper based approach.
- For many safety management was not mature.

Better safety performance would now require:

- **better risk management competence;**
- **a safety management system; AND**
- **a positive safety culture to flourish.**

KEY TOOLS IN OUR STRATEGY



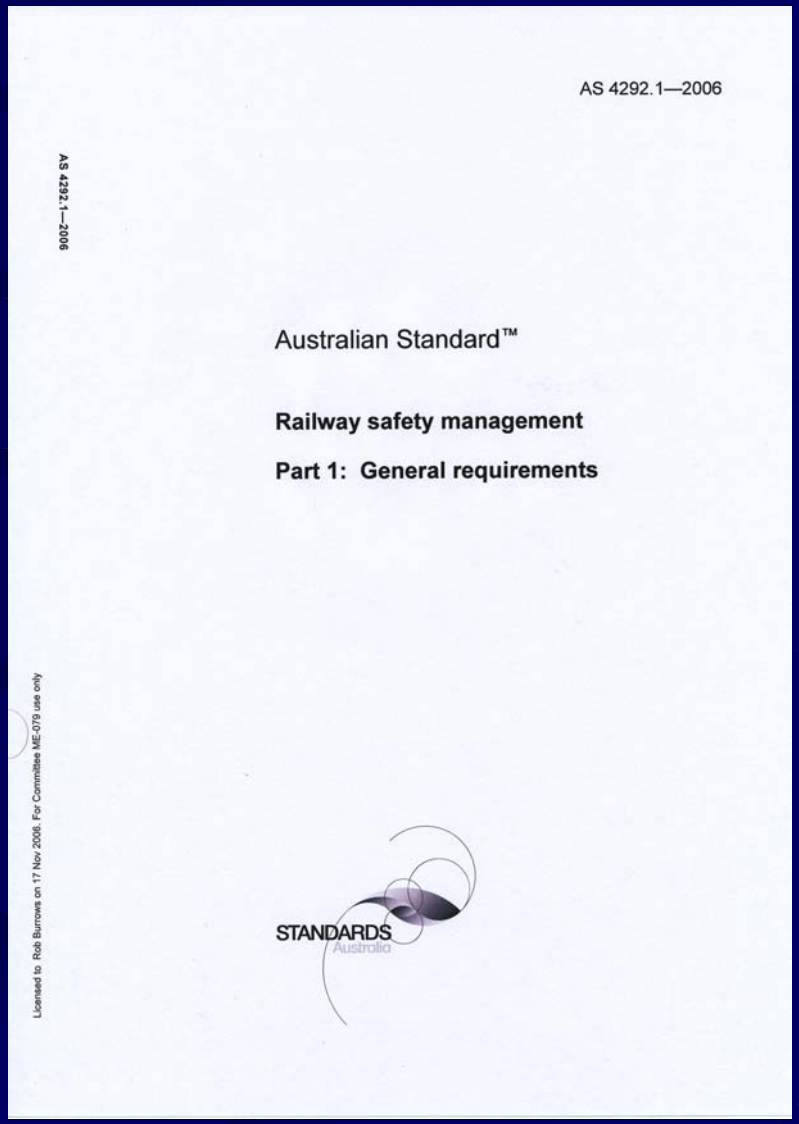
SAFETY MANAGEMENT STANDARD

AS4292.1 – 2006 Railway safety management

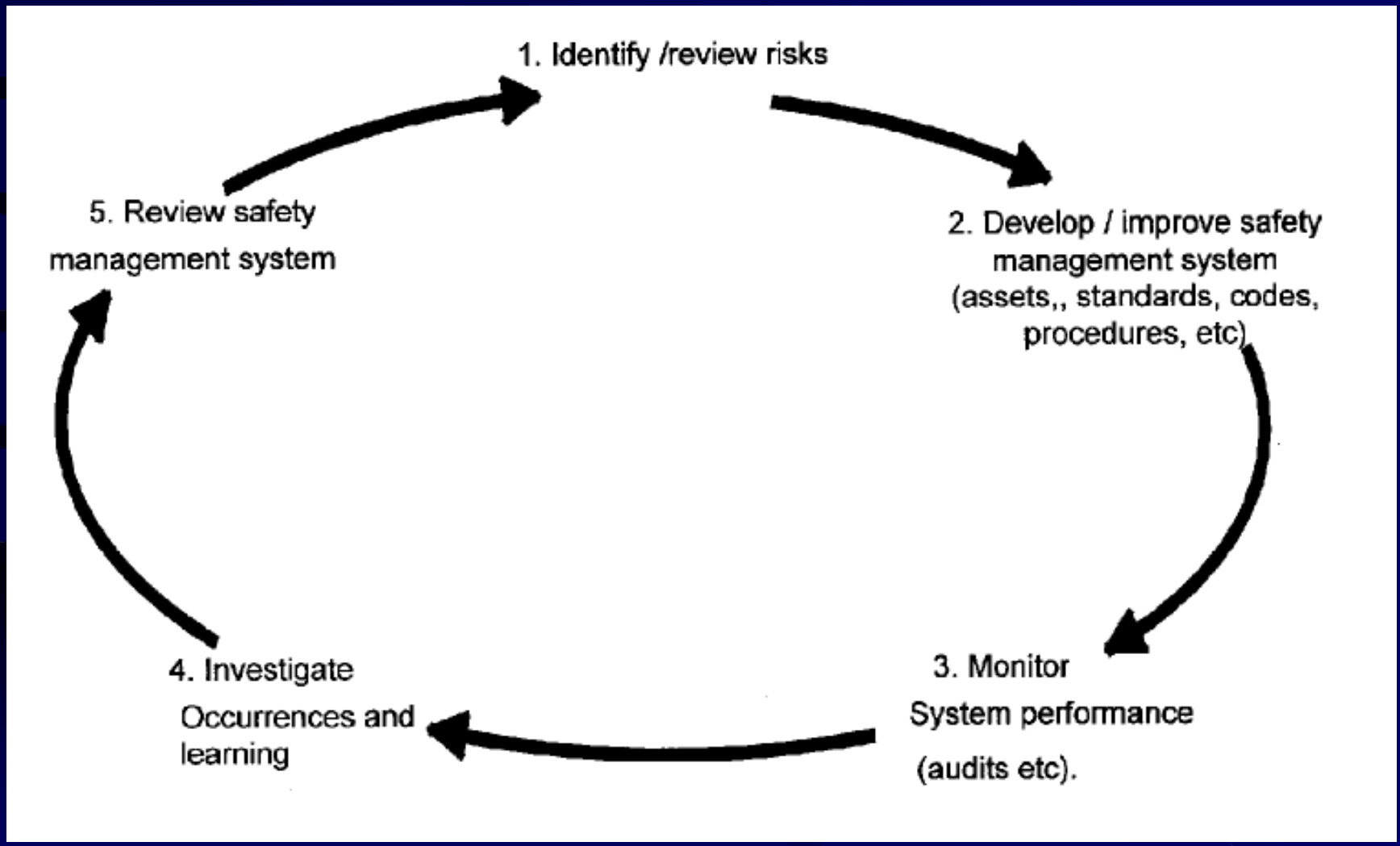
- 4292.1 Part 1: General requirements
- 4292.2 Part 2: Track, civil and electrical infrastructure
- 4292.3 Part 3: Rolling stock
- 4292.4 Part 4: Signalling & telecomms systems & equipment
- 4292.5 Part 5: Operational systems
- 4292.7 Part 7: Railway safety investigation

AUSTRALIAN STANDARD AS4292.1 – 2006

Railway safety management – Part 1: General requirements



AS4291.1 – Continuous Improvement Management Cycle



SAFETY CULTURE
AS4292.1 - 2006

2.14 SAFETY CULTURE

The organization shall include in its safety management system methods to develop and maintain a positive safety culture taking particular account of—

(a) the importance of leadership & commitment of senior management;

(b) the executive safety role of line management;

(c) the need to involve rail safety workers at all levels;

(d) the need for openness of communication;

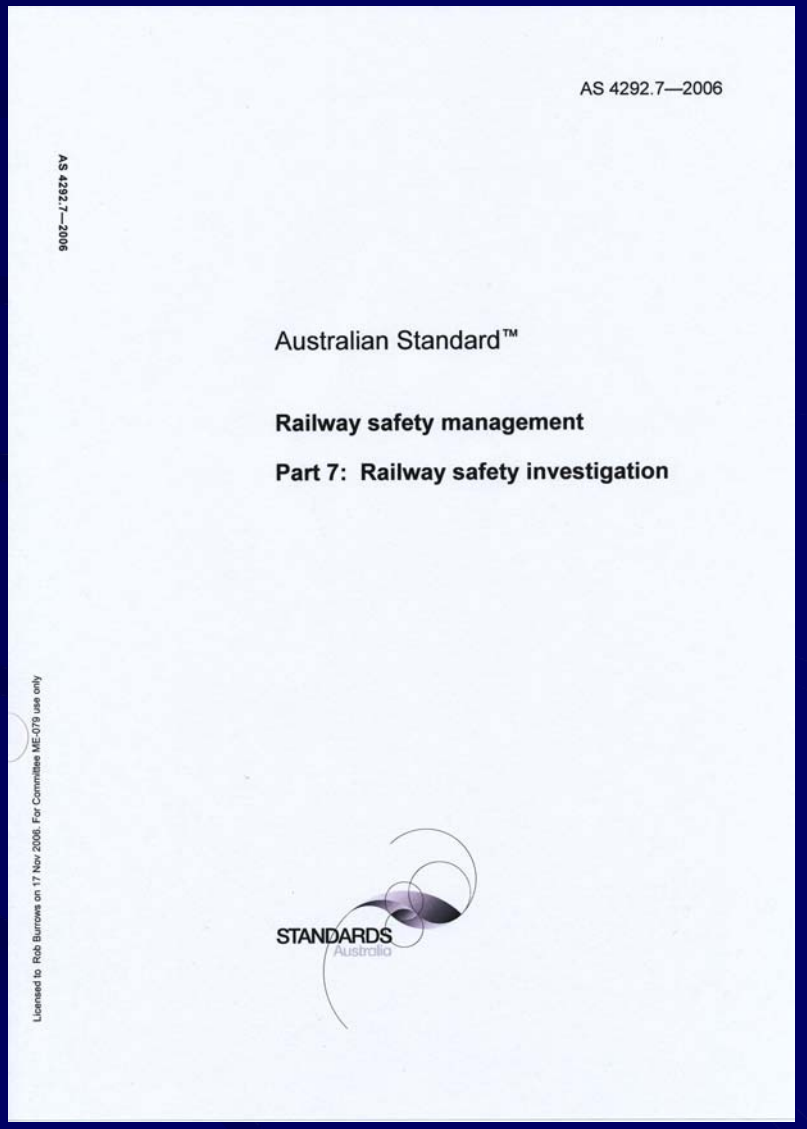
(e) the need for human factors to be positively addressed;

(f) awareness & recognition of opportunities for safety improvement;

(g) willingness to devote resources to safety.

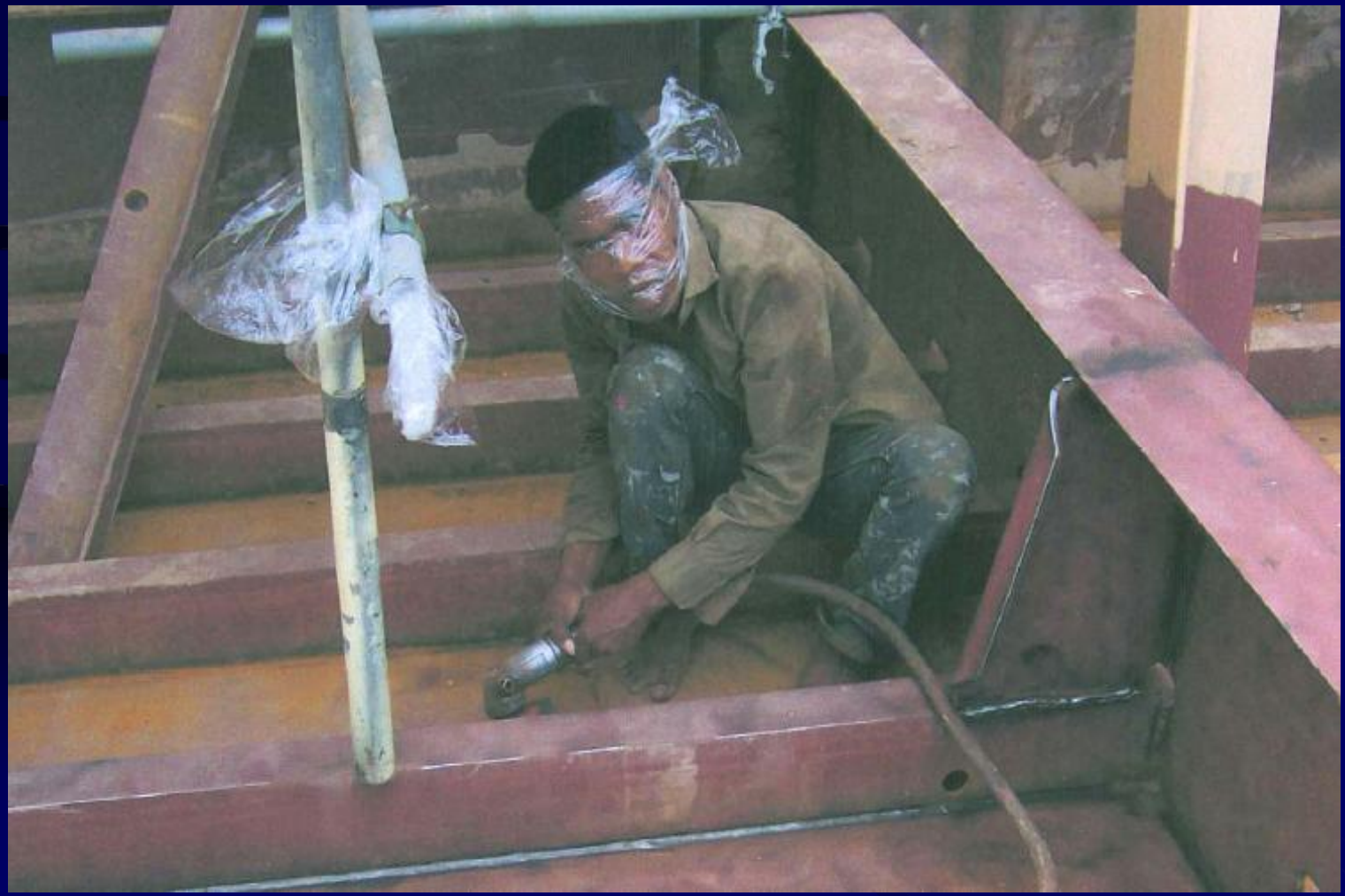
AUSTRALIAN STANDARD AS4292.1 – 2006

Railway safety management – Part 7: Railway safety investigation



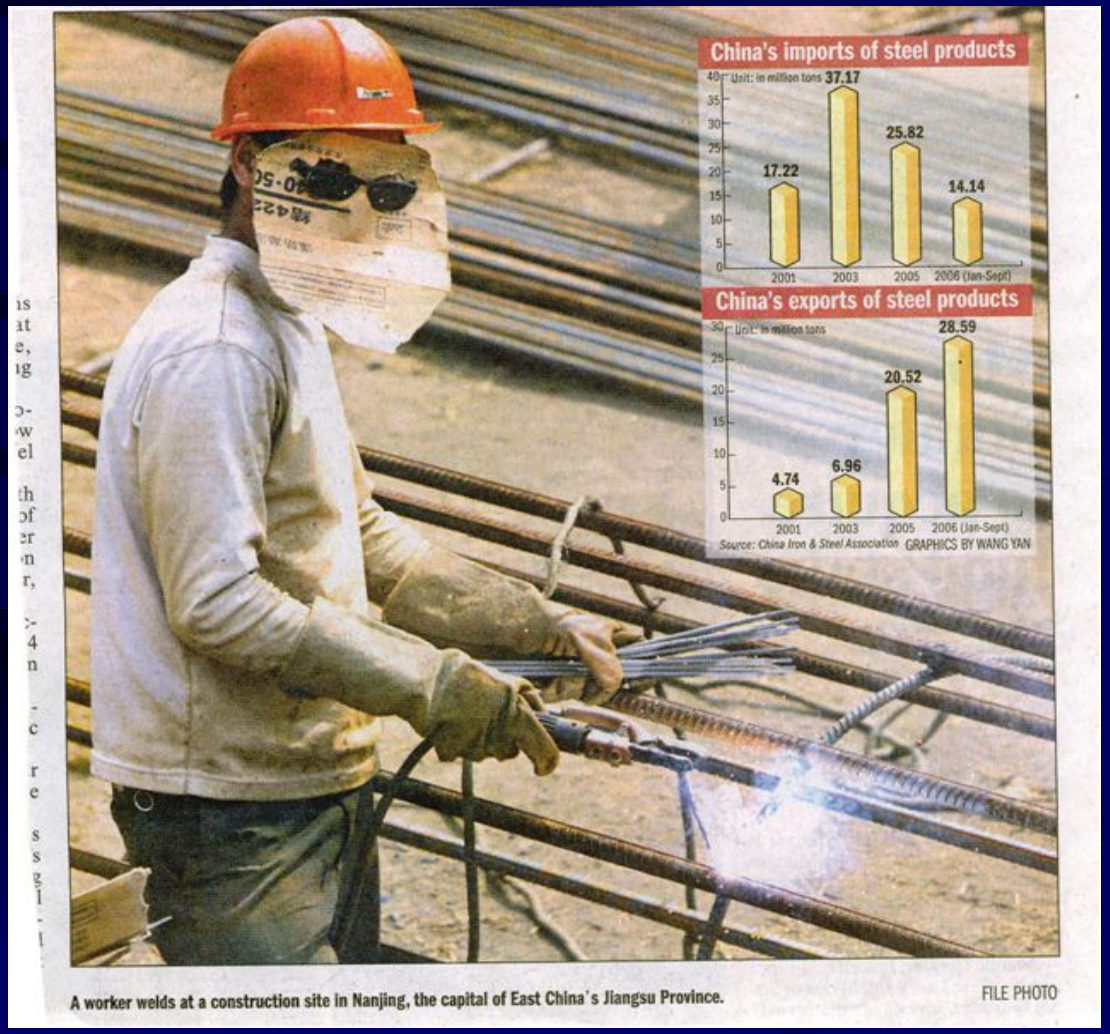
SAFETY CULTURE - Taking risks

Dust mask in South Africa –safety glass?



SAFETY CULTURE – Taking risks

Safety visor in Nanjing – it could burn?



A worker welds at a construction site in Nanjing, the capital of East China's Jiangsu Province. FILE PHOTO

SAFETY CULTURE - Taking risks

Crossing a river – baby first!

SAFETY CULTURE – Taking risks

Driving on flood damaged track….near Perth

SAFETY LESSONS

- Many cases of:
  - Perhaps not knowing the risks
  - Ignoring risks they know
- What appears risky to us may seem normal to them.
- It is a lot about different values and safety cultures.
- What then happens if an error or mistake is made?

SAFETY LESSONS - Mistakes

Error – Load crushes a truck

SAFETY LESSONS - Mistakes

Error – Overloading a container lifter

SAFETY LESSONS - Mistakes

Error - Loading a boat

SAFETY LESSONS - Mistakes

Error – Overloading a plane

SAFETY LESSONS - Mistakes

Error - Overloading a cart

SAFETY LESSONS

WHO IS BEING A DONKEY?

Why do people take risks?
Why do errors happen?

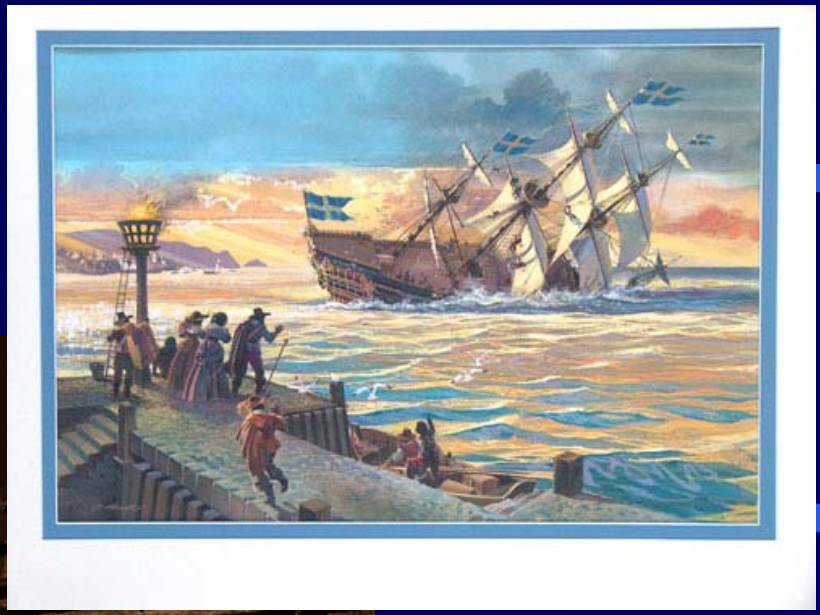
Errors keep repeating!
Are we good at learning?
What if errors become a disaster?

SAFETY LESSONS – Errors to disasters

Mary Rose – sank 1545 ……about 500 drowned.

SAFETY LESSONS – Errors to disasters

Vasa – sank 1628



SAFETY LESSONS – Errors to disasters

Herald of Free Enterprise capsized 1987 ...

…….193 drowned

SAFETY LESSONS

Waterfall…….speeding – 7 dead

SAFETY CULTURE

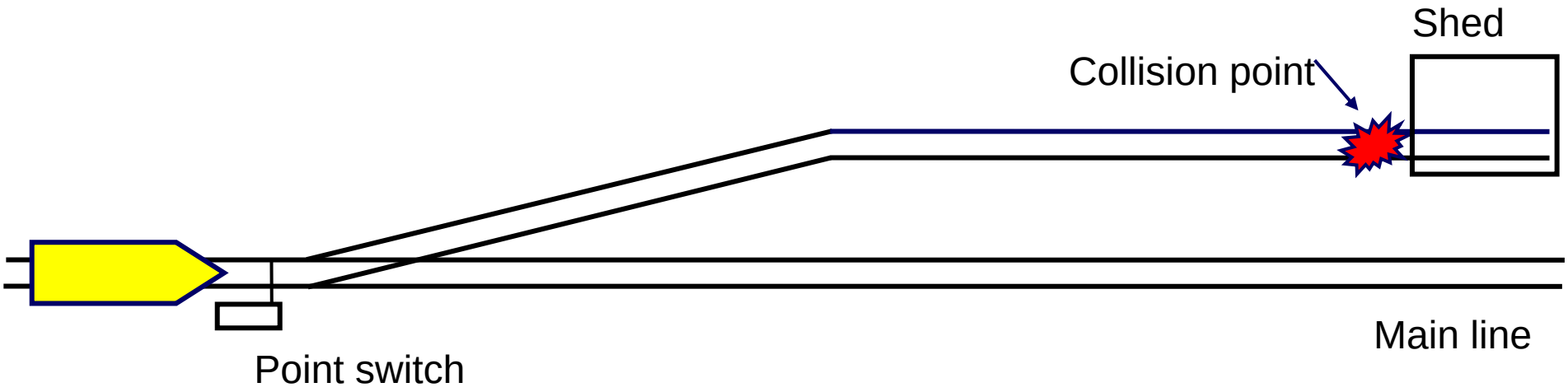
...is about

THE WAY WE DO THINGS AROUND HERE!

….helps determine how we make safety decisions

SAFETY CULTURE

The way we do things around here!



Kalgoorlie goods shed - Not to Scale

SAFETY CULTURE

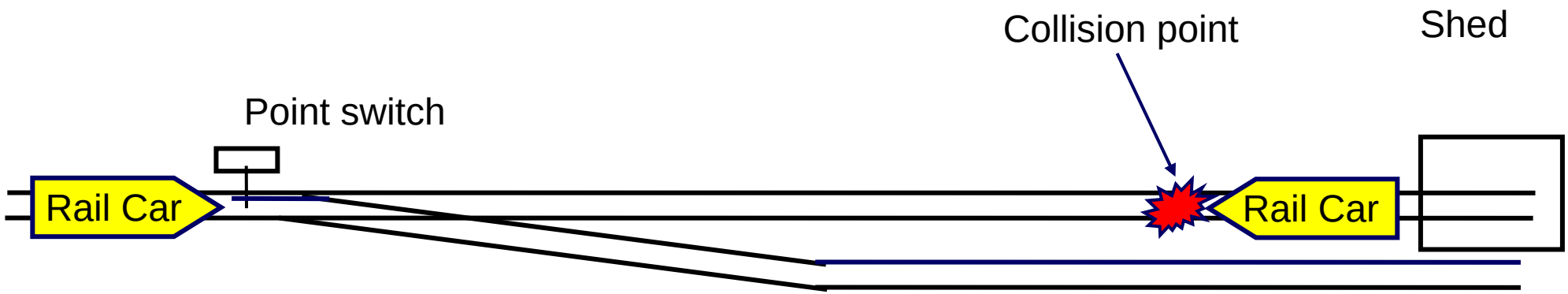
The way we do things around here…

…..putting production before safety.

Worker ignores rules, takes short cut and dies

SAFETY CULTURE

The way we do things around here!



Nowergup – run to shed - Not to Scale

SAFETY CULTURE

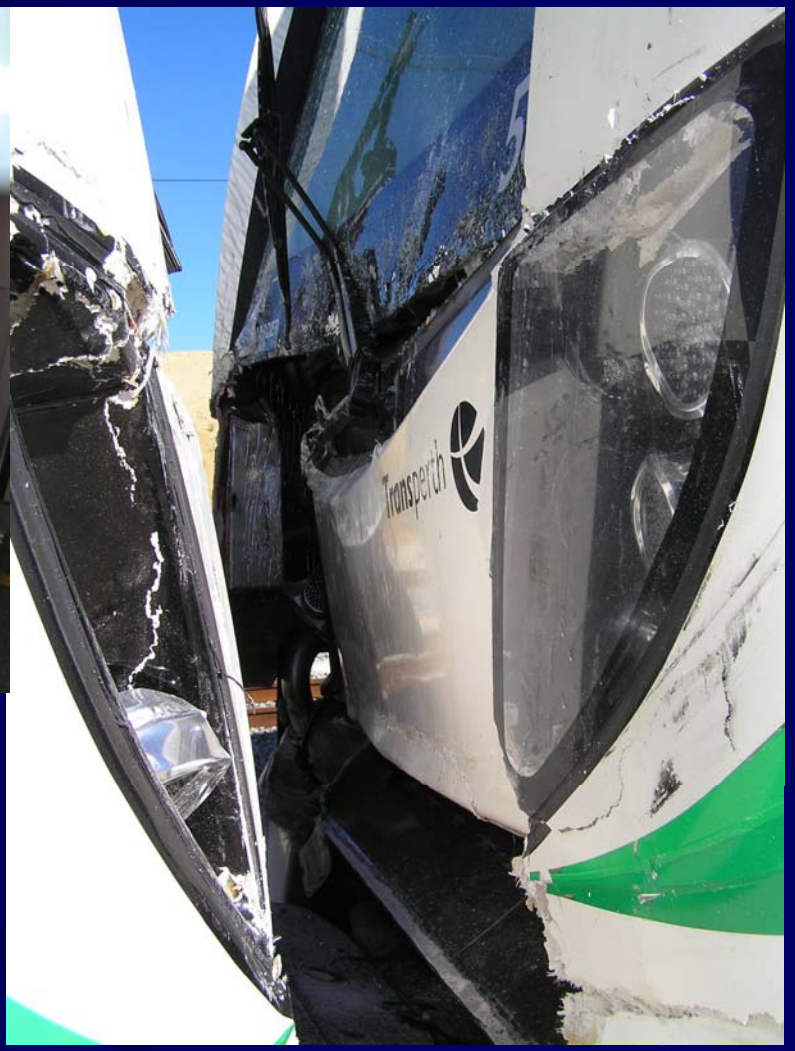
The way we do things around here!

SAFETY CULTURE

The way we do things around here!

SAFETY CULTURE

The way we do things around here!



Short cut – driver left new train unattended

SAFETY CULTURE

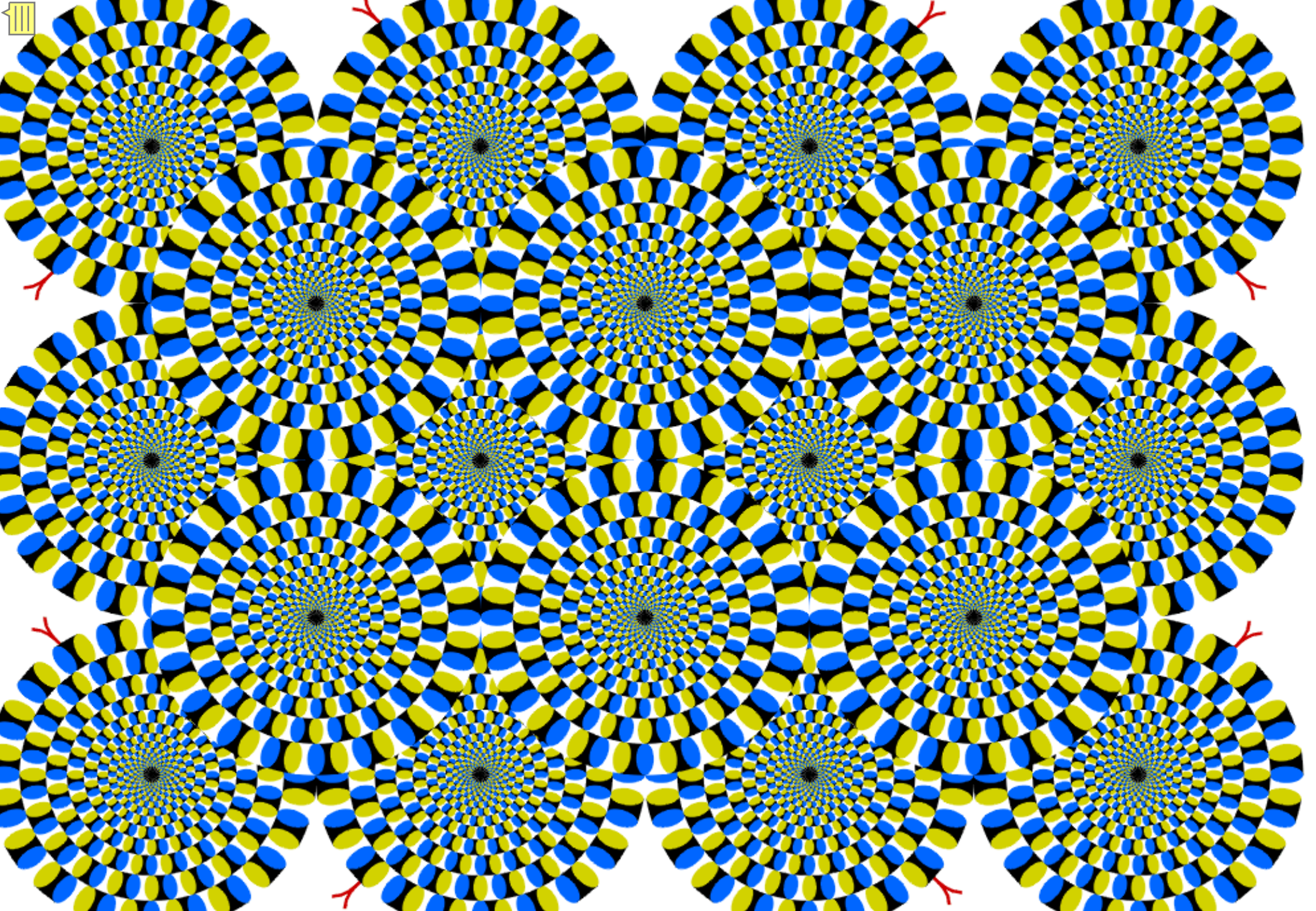
The way we do things around here!

It is not easy to see if the safety culture is good?

The mind is easily influenced and can play tricks.

DON’T BELIEVE YOUR EYES OR WHAT YOU ARE TOLD – COLLECT THE FACTS / DATA (TQM).

Safety culture needs to be measured.



SAFETY CULTURE

The way we do things around here!

SAFETY CULTURE

The way we do things around here!

SAFETY CULTURE

--improving operator's safety culture

Operators need:-

- To develop ways to improve safety culture and reduce error
- This includes improving rules, standards, procedures, technology and competence to support that culture.

Regulators need:-

- To do more systematic audits and inspections to ensure the SMS is being implemented and improved; and
- To make ensure operators measure their safety culture and work to improve identified areas of weakness.

NEXT STEPS

3 Key Projects for Safety Improvement

- Contributing Factors Framework (CFF)
- Rail Resource Management (RRM)
- Safety Culture Toolkit

CONTRIBUTING FACTORS FRAMEWORK

What is a Contributing Factor?

- Any element of an occurrence which, if removed from the sequence;
  - Would have prevented the occurrence, or
  - Reduced the severity of the occurrence.

- Rarely a single event or factor!

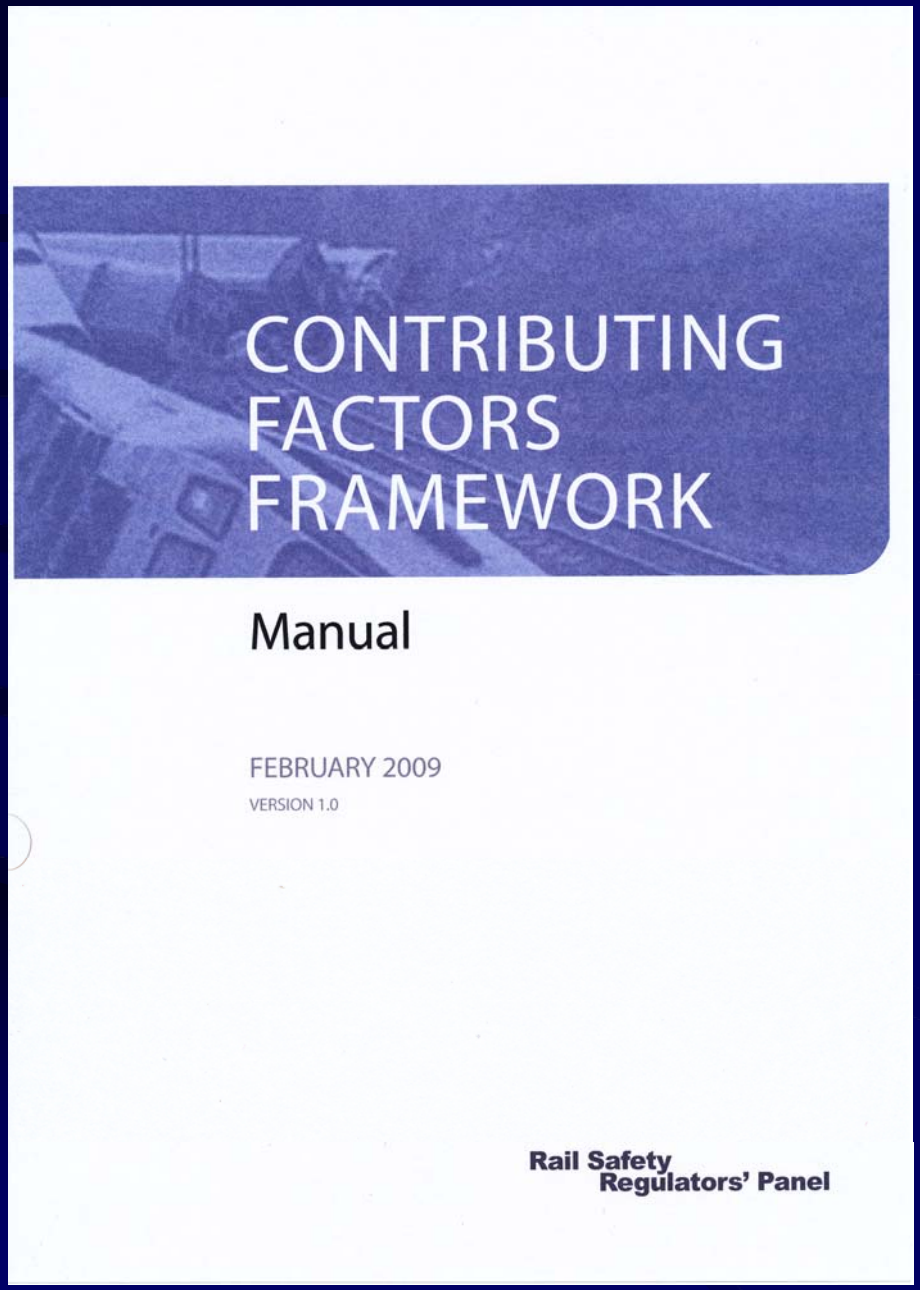
CONTRIBUTING FACTORS FRAMEWORK

The CFF is a framework for

- Capturing; and
- Categorising

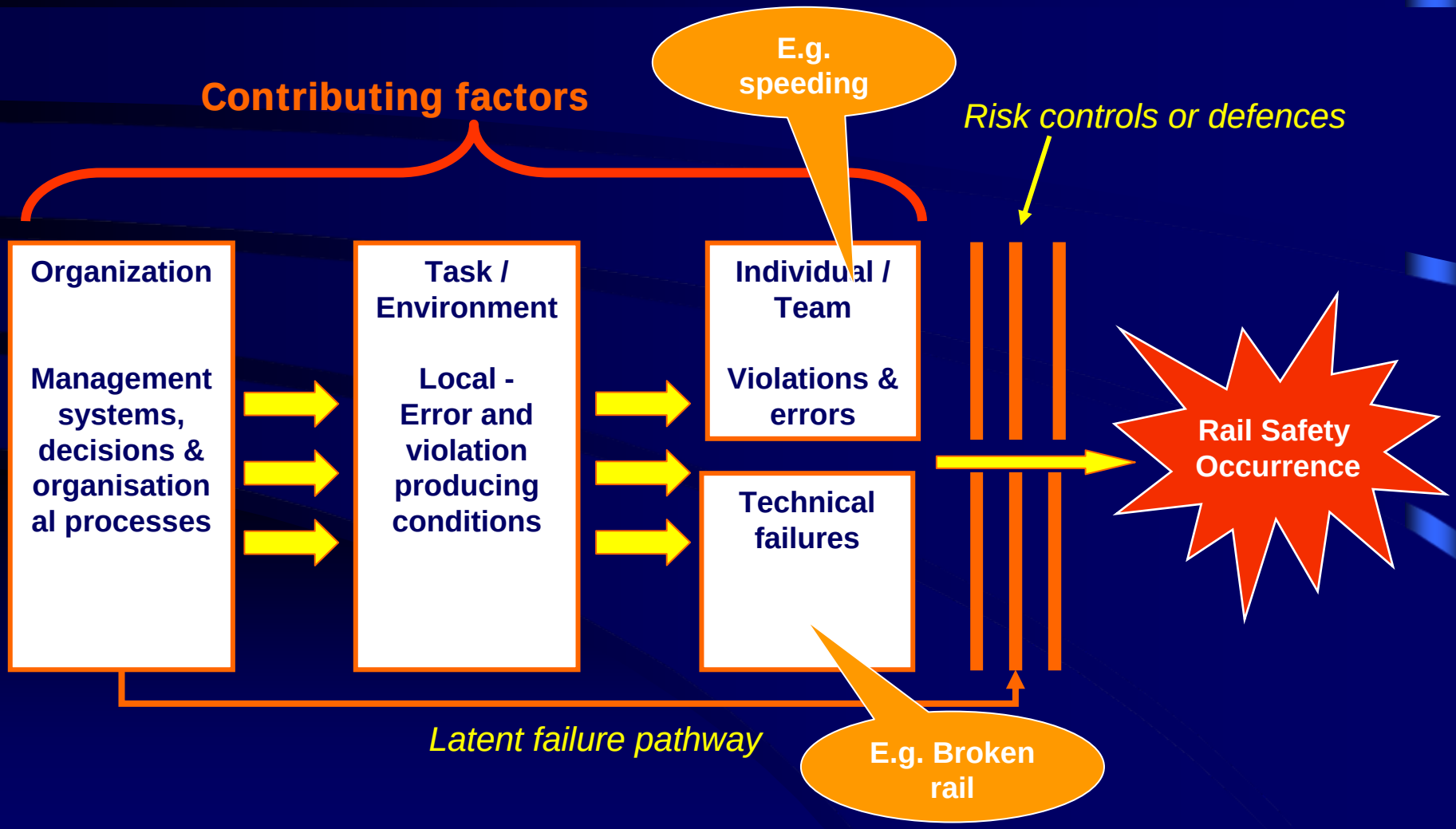
the systemic contributing factors to accidents

CONTRIBUTING FACTORS FRAMEWORK

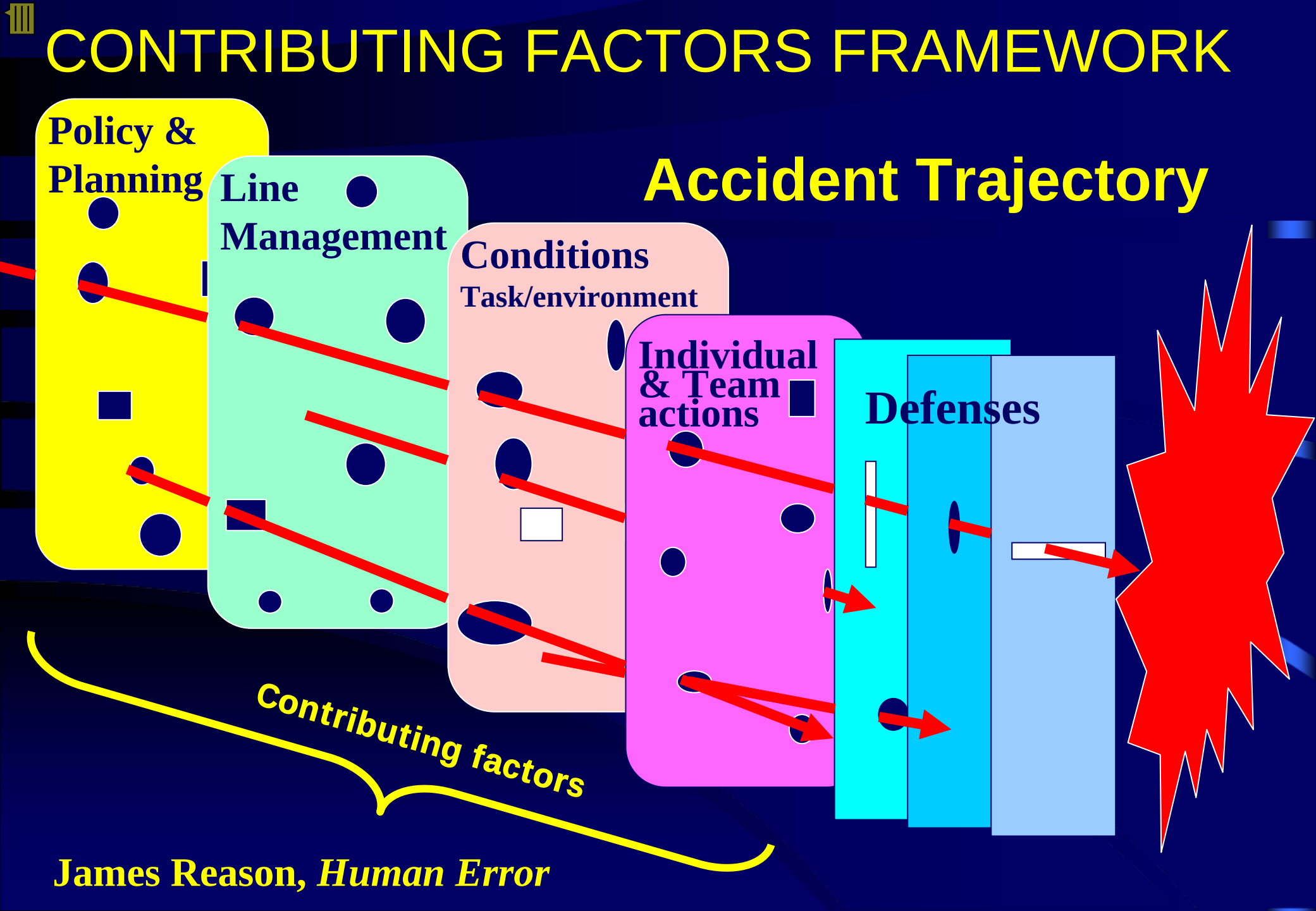


CONTRIBUTING FACTORS FRAMEWORK

A framework for coding the systemic contributors to rail safety occurrences.



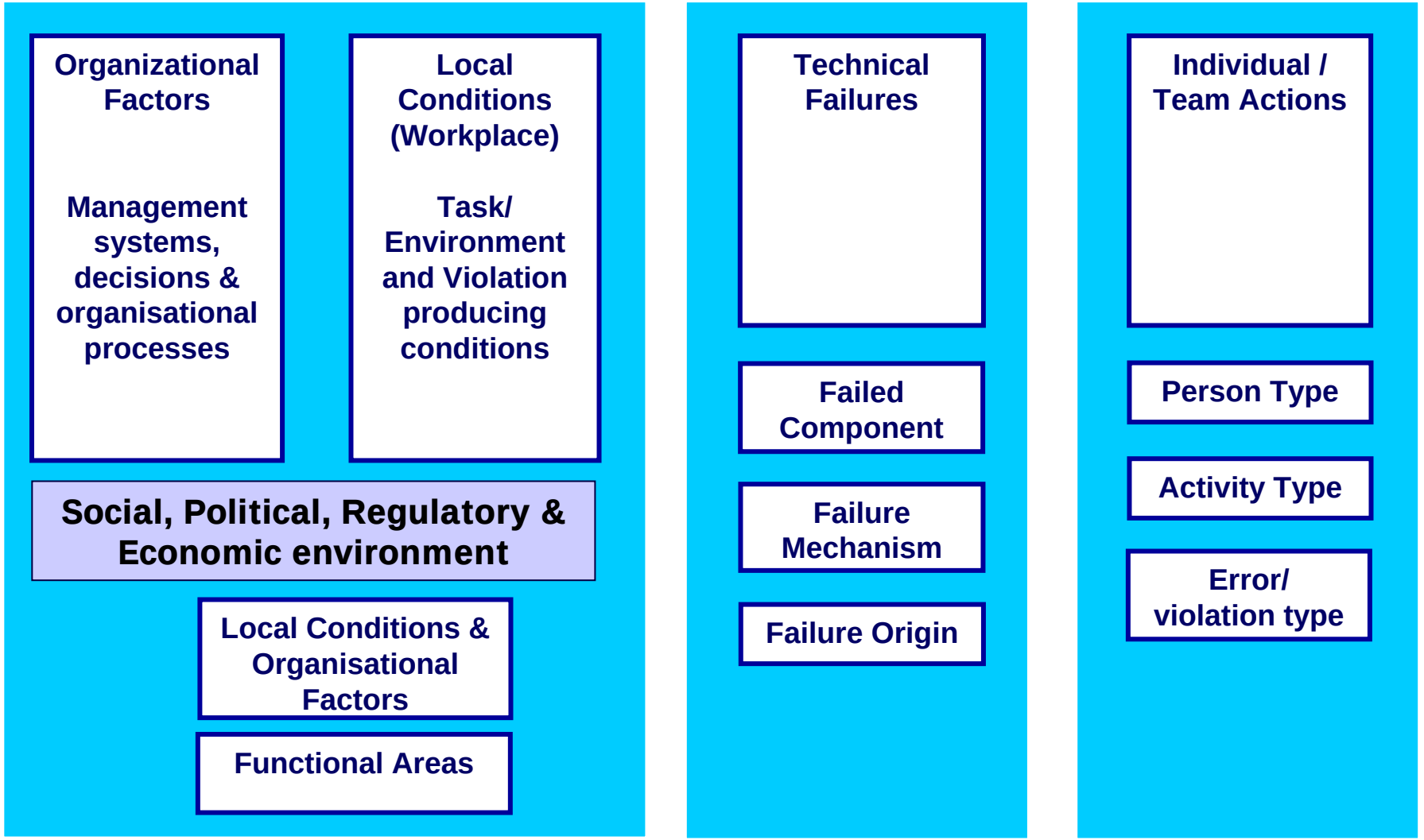
CONTRIBUTING FACTORS FRAMEWORK



James Reason, *Human Error*

CONTRIBUTING FACTORS FRAMEWORK

CFF Main Categories & Related Information



CFF Data Types

CONTRIBUTING FACTORS FRAMEWORK

Local Conditions & Organisational Factors	Individual / team actions	Technical failures	
Local conditions	**Person type**	**Failed component**	**Failure mechanism**
Personal factors*	Infrastructure maintainers	***Rollingstock***	Corrosion
Knowledge, skills & experience*	Network controllers	Bogies	Deformation
Task demands*	Rollingstock maintainers	Braking systems	Electrical discontinuity
Physical environment*	Train crew	Car-body	Fracture
Social environment*	Station staff	Coupler/drawgear	Mechanical discontinuity
	Terminal staff	Load restraining equipment	Software/firmware anomaly
	Other persons	On board traction systems	Wear
		On board train protection systems	Other failure mechanism
Organisational factors	**Activity type**	***Infrastructure***	**Failure origin**
Procedures*	Preparation & planning	Bridge	Design
Training & assessment*	Operating equipment	Buildings	Manufacture
Equipment, plant & infrastructure*	Monitoring & checking	Cuttings	Installation / commissioning
People management*	Handover/takeover	Drains/flood mitigation systems	Operation
Organisational management*	Other activity type	Lineside rolling stock fault detection systems	Maintenance
External organisational influences*		Overhead power systems	Decommissioning
Functional area	**Error / violation type**	Road-rail interfaces	
Freight handling	Error	Switches/crossings	
Infrastructure construction & maintenance	Violation	Track	
Off-train operations	Unknown error	Track protection devices	
On-train operations		Tunnels	
Passenger management		***Signalling & communications***	
Rollingstock construction & maintenance		Communication systems	
Other functional area		Control interface equipment	
		Interlocking systems	
		Traffic control	
		Train detection systems	
		Wayside signalling equipment	

Table 1: Summary of CFF categories and related data sets.

CONTRIBUTING FACTORS FRAMEWORK

Coding template

Record No: [This is the record number of the occurrence in your database]	**Report prepared by:** [Name] **Date prepared:** [31-07-2006]

OCCURRENCE DESCRIPTION (ON-S1 & OC-G1 Categories)		
[Text description]	**Date:**	[Date]
	Location:	[Location]
	Organisation:	[Organisation]

Occurrence Type: (include all ON-S1 & OC-G1 Categories events that occurred)

Occurrence type:	Occurrence cat:	Occurrence sub-cat:

INDIVIDUAL/TEAM ACTIONS

Findings/short description	Person type	Activity type	Error/violation type

TECHNICAL FAILURES

Findings/short description	Failed component	Keyword (optional)	Failure mechanism	Failure origin

LOCAL CONDITIONS & ORGANISATIONAL FACTORS

Findings / short description	Local condition/ Organisational factor	Keyword	Functional area (affected by the failure)

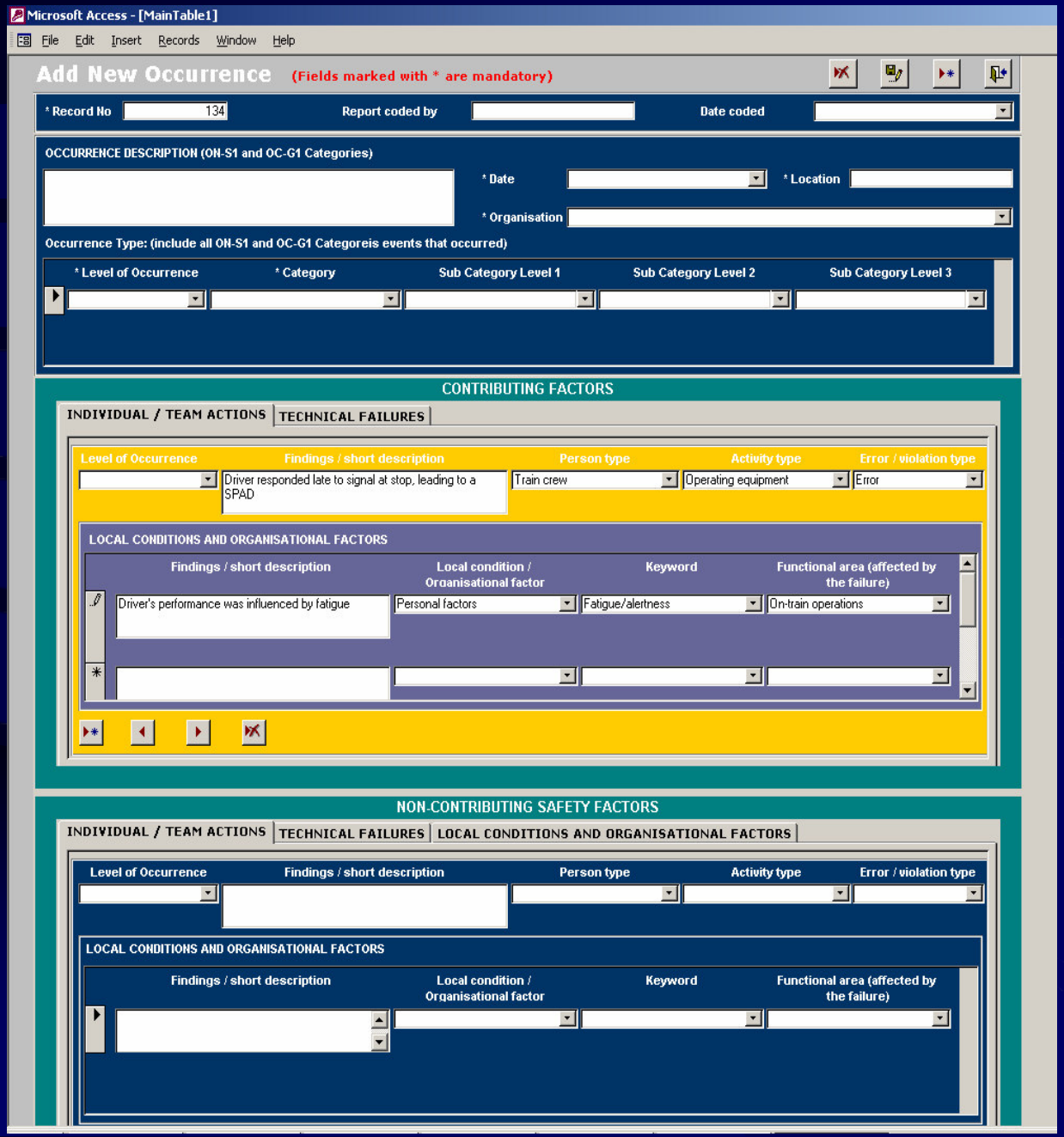
NON-CONTRIBUTING SAFETY FACTORS *(I.e. identified safety issues that did not contribute to this occurrence)*

Findings/short description	*Replace text below with relevant item. Replace only if a factor is identified.*		
	[Person type]	**[Activity type]**	**[Error/violation type]**
	[Failed component] (optional)	**[Failure mechanism]**	**[Failure origin]**
	[Local condition/ Organisational factor]	**[Keywords]**	**[Functional area]**

FEEDBACK ON USING THE CFF: (Document any problems you had using the Contributing Factors Framework here)

CONTRIBUTING FACTORS FRAMEWORK

CFF Database



CONTRIBUTING FACTORS FRAMEWORK

The CFF Manual is on the internet.

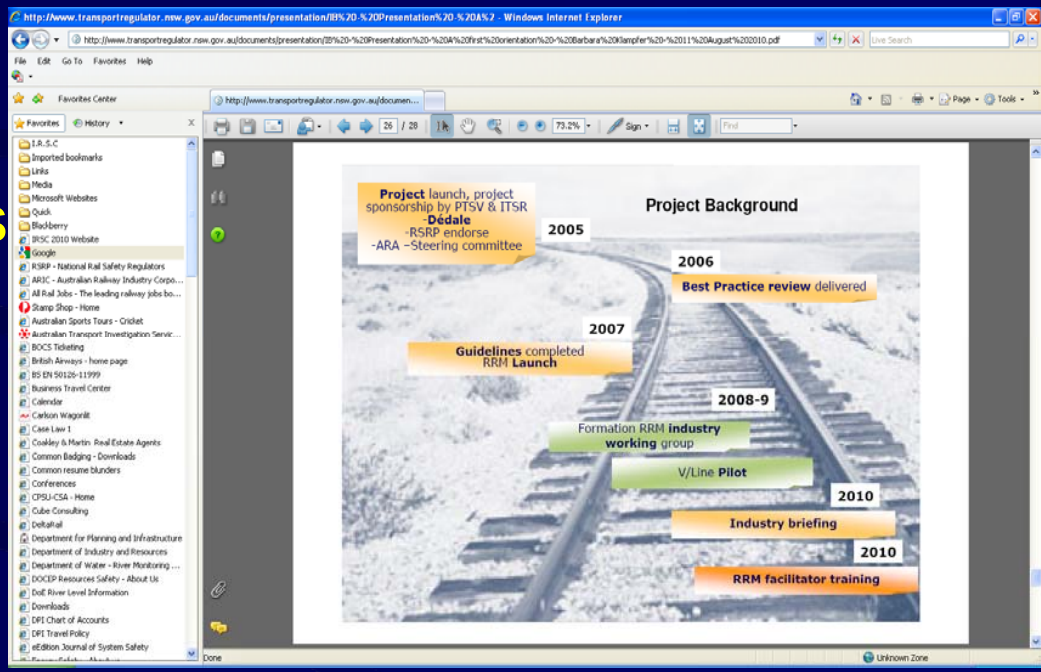
RAIL RESOURCE MANAGEMENT (RRM)

RRM Toolkit is based on

CRM and BRR

RRM is about:

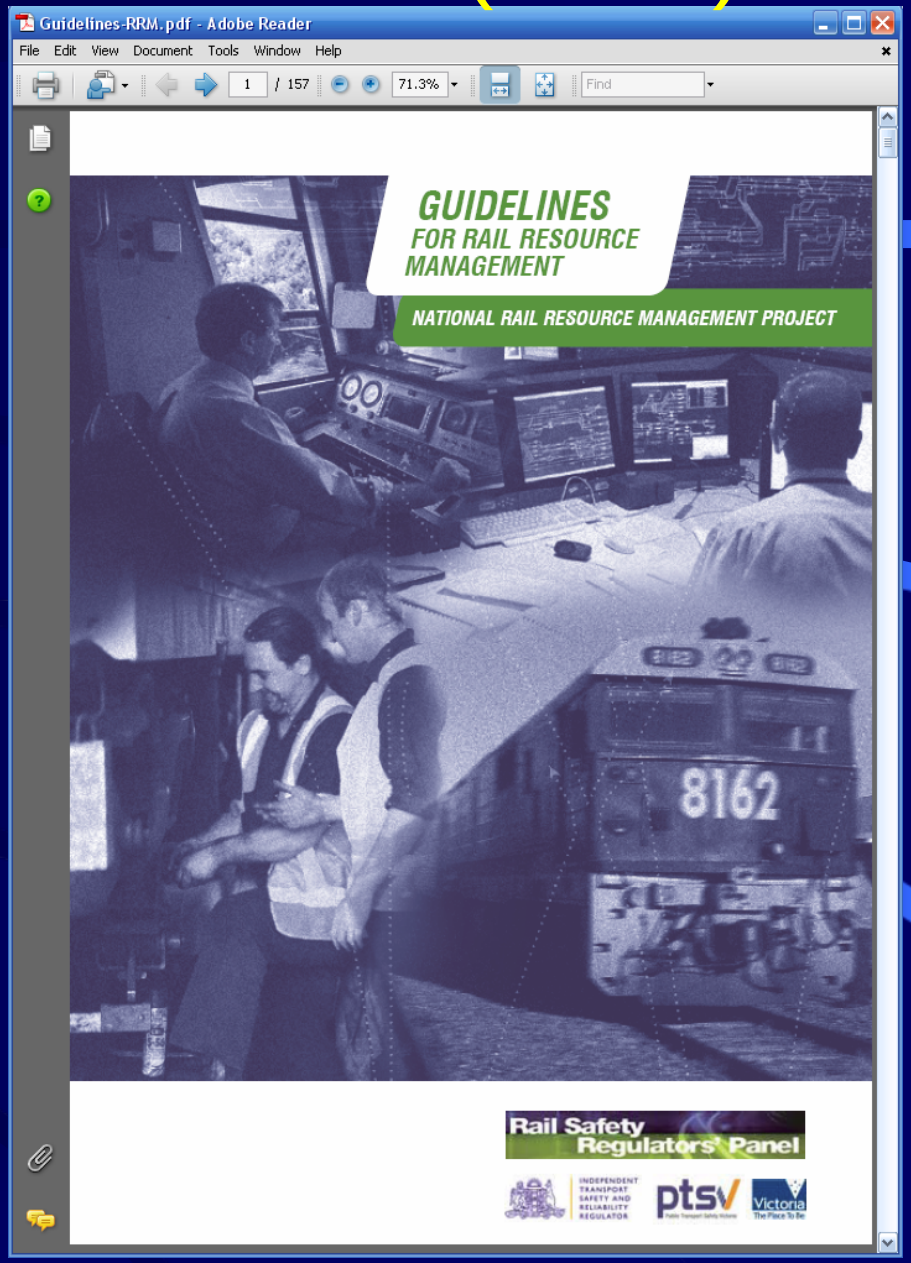
- reducing railway occurrences attributable to human error
- enabling people to manage hazardous situations and errors.
- people making better use of resources, including team members, other people, equipment, information and procedures



RAIL RESOURCE MANAGEMENT (RRM)

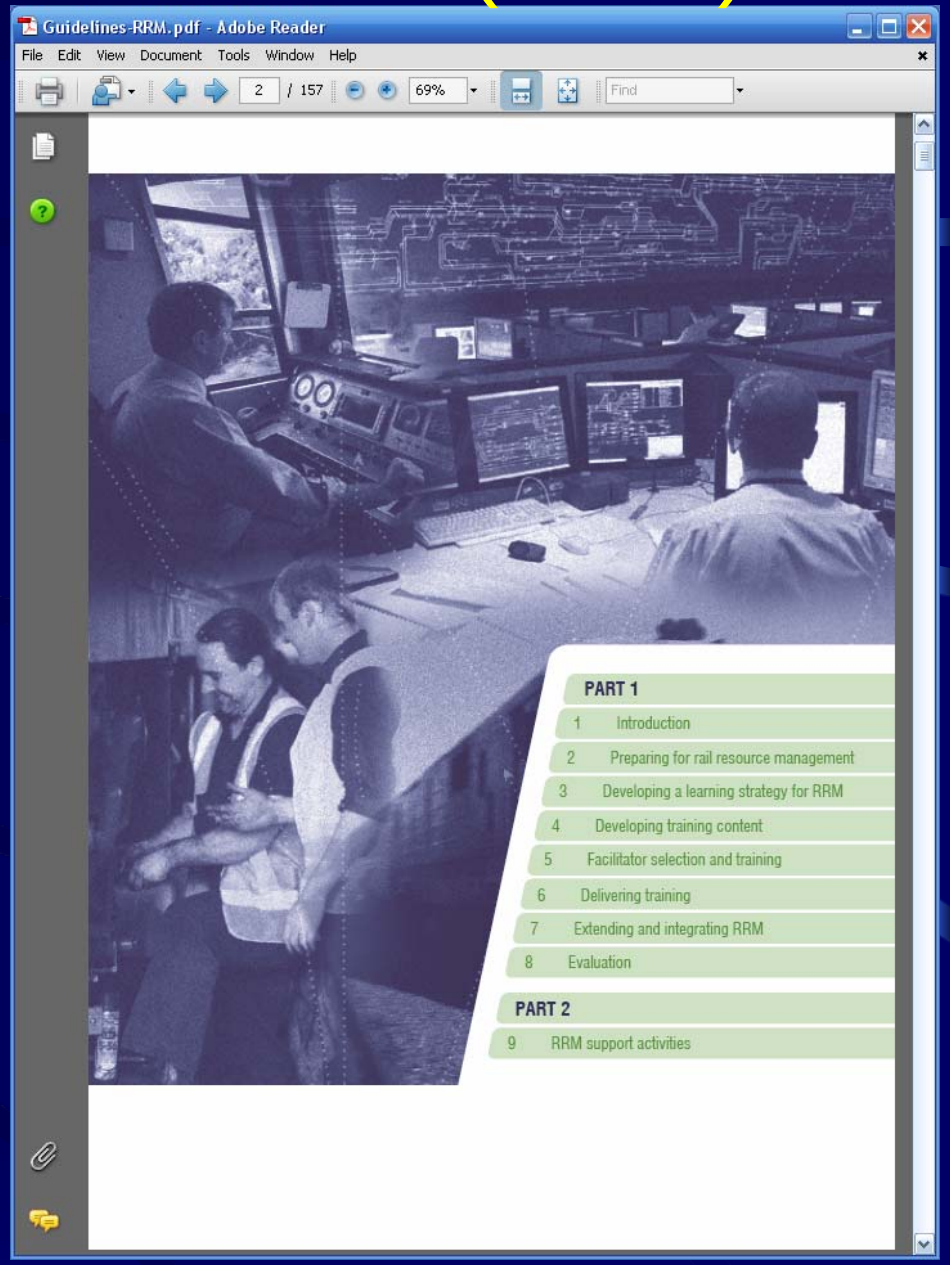
In practice:

- RRM is about:
  - strategies to reduce the frequency and consequence of errors
  - improving communication skills
  - cross checking and monitoring
  - training for error detection and recovery
  - transparent feedback systems



RAIL RESOURCE MANAGEMENT (RRM)

- Addresses key elements for a good safety culture such a leadership and safety behaviours
  - Responsibilities
  - Involving others
  - Right authority
  - Follow procedures and directions
  - Intervening
  - Decisive action
- Any railway safety worker may be required to take a leadership role.



RAIL RESOURCE MANAGEMENT (RRM)

- RRM Implementation:
  - Guidelines for RRM Management
  - RRM Training Toolkit
    - ➔Practical Theory
    - ➔Major exercises
    - ➔Railway examples – accident case studies
    - ➔Exercises to practice on

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    - ➔Major exercises
    - ➔Railway examples – accident case studies
    - ➔Exercises to practice on

RAIL RESOURCE MANAGEMENT (RRM)

- RRM Implementation:
  - Need organisation commitment and a plan
  - Available on internet for use by Australian railway industry
  - Need to train facilitators

RAIL RESOURCE MANAGEMENT (RRM)

RRM Guidelines are on the internet.

SAFETY CULTURE TOOLKIT

Rail Industry Safety and Standards Board - Windows Internet Explorer

http://www.rissb.com.au/linkdev/site/Tool%20Kit.php

File Edit View Favorites Tools Help

Rail Industry Safety and Standards Board

RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD

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TEXT SIZE A- A+

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

- Rules & Procedures
- Railway Level Crossings
- National Rail Safety Week
- National Rail Safety Strategy
- Safety Managers Group
- Rail Safety Data
- Safety Culture Tool Kit
- Current Safety Projects
- Useful Safety Links
- Dangerous Goods Matrix

SAFETY CULTURE TOOL

Industry has identified an urgent need for a consistent way of measuring safety culture to facilitate rectification of identified gaps in that safety culture. To this end, the RISSB has adapted the UK rail industry's RSSB Safety Culture Tool.

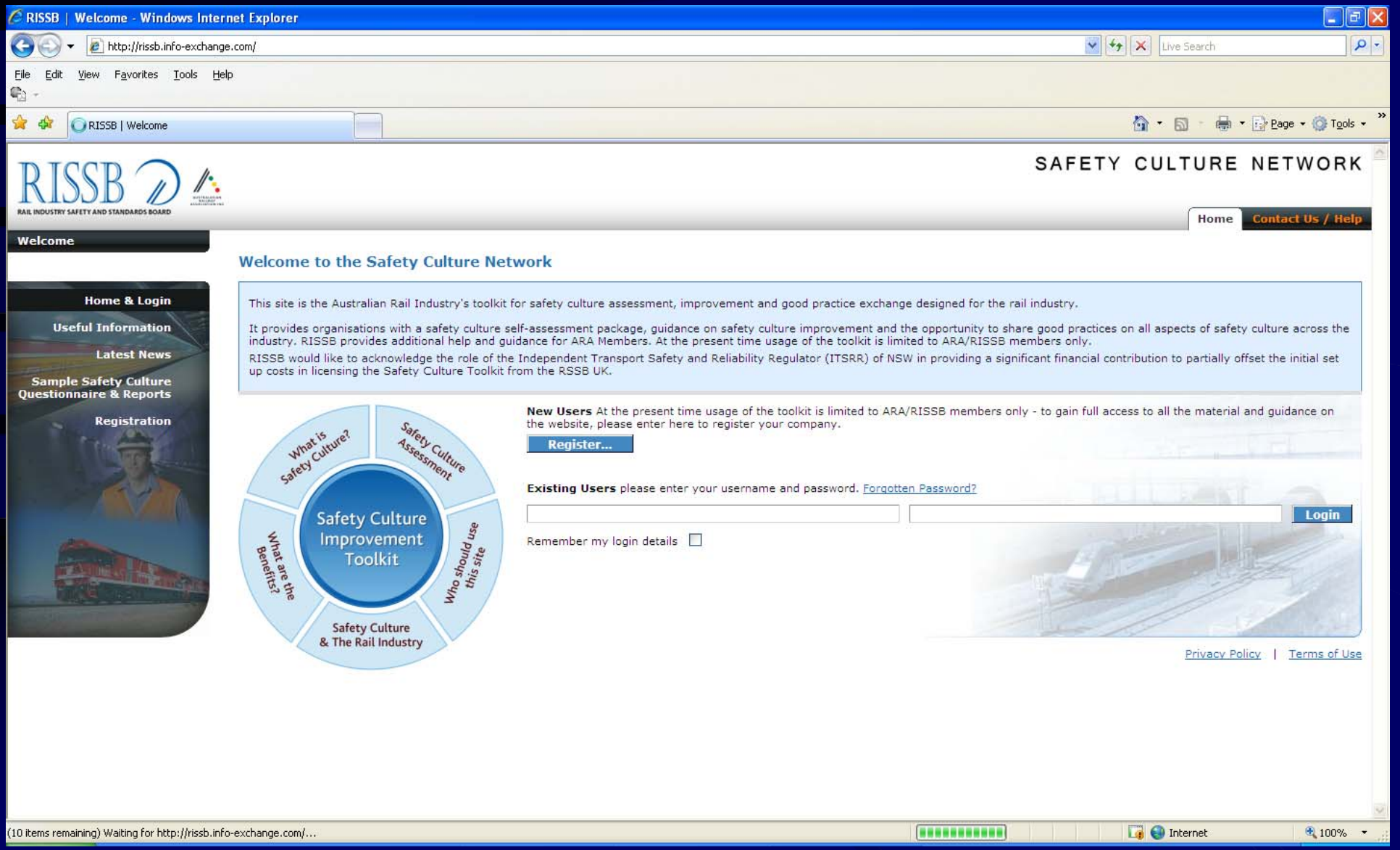
The RSSB Safety Culture Tool has undergone extensive trials on the UK rail industry. It provides a confidential, secure, consistently repeatable, automated way of administering a Safety Culture Survey within a rail organization. It then automatically provides statistically valid analysis results to the user, identifying potential gaps within the safety culture of that organization, benchmarking against industry averages (in a confidential way) and then providing information on a set of suggested interventions.

The Australian Rail Industry's RISSB Safety Culture Toolkit is available free of charge to ARA Members.

To register your company to use the toolkit, click here or on the graphic below:

Done | Internet | 100%

SAFETY CULTURE TOOLKIT



SAFETY CULTURE TOOLKIT

RISSB | Useful Information - Windows Internet Explorer

http://rissb.info-exchange.com/usefulinfo.asp?id=130214

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RISSB RAIL INDUSTRY SAFETY AND STANDARDS BOARD

SAFETY CULTURE NETWORK

Home Contact Us / Help

Useful Information

- Home & Login
- Useful Information
- Latest News
- Sample Safety Culture Questionnaire & Reports
- Registration

Useful Information

Useful Information > What is Safety Culture? > A useful safety culture framework

- What is safety culture?
- Definition and background
- **A useful safety culture framework**
- Who should use this site?

A useful safety culture framework

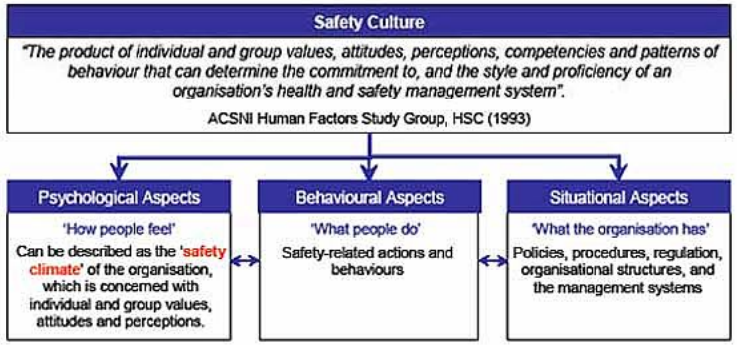


Figure 1 - A Three Aspect Approach to Safety Culture (based upon Cooper, 2000)

A useful framework distinguishes between three interrelated aspects of safety culture, specifically:

Psychological aspects (often referred to as 'safety climate')
Behavioural (or 'organisational') aspects
Situational (or 'corporate') aspects

The psychological aspect of safety culture refers to 'people's perceptions' of safety and safety management systems. This encompasses the beliefs, attitudes, values and perceptions of individuals and groups at all levels of the organisation, which are often referred to as the safety climate of the organisation. This can be measured subjectively through the use of safety climate questionnaires that aim to uncover the workforce's attitudes and perceptions at a given point in time.

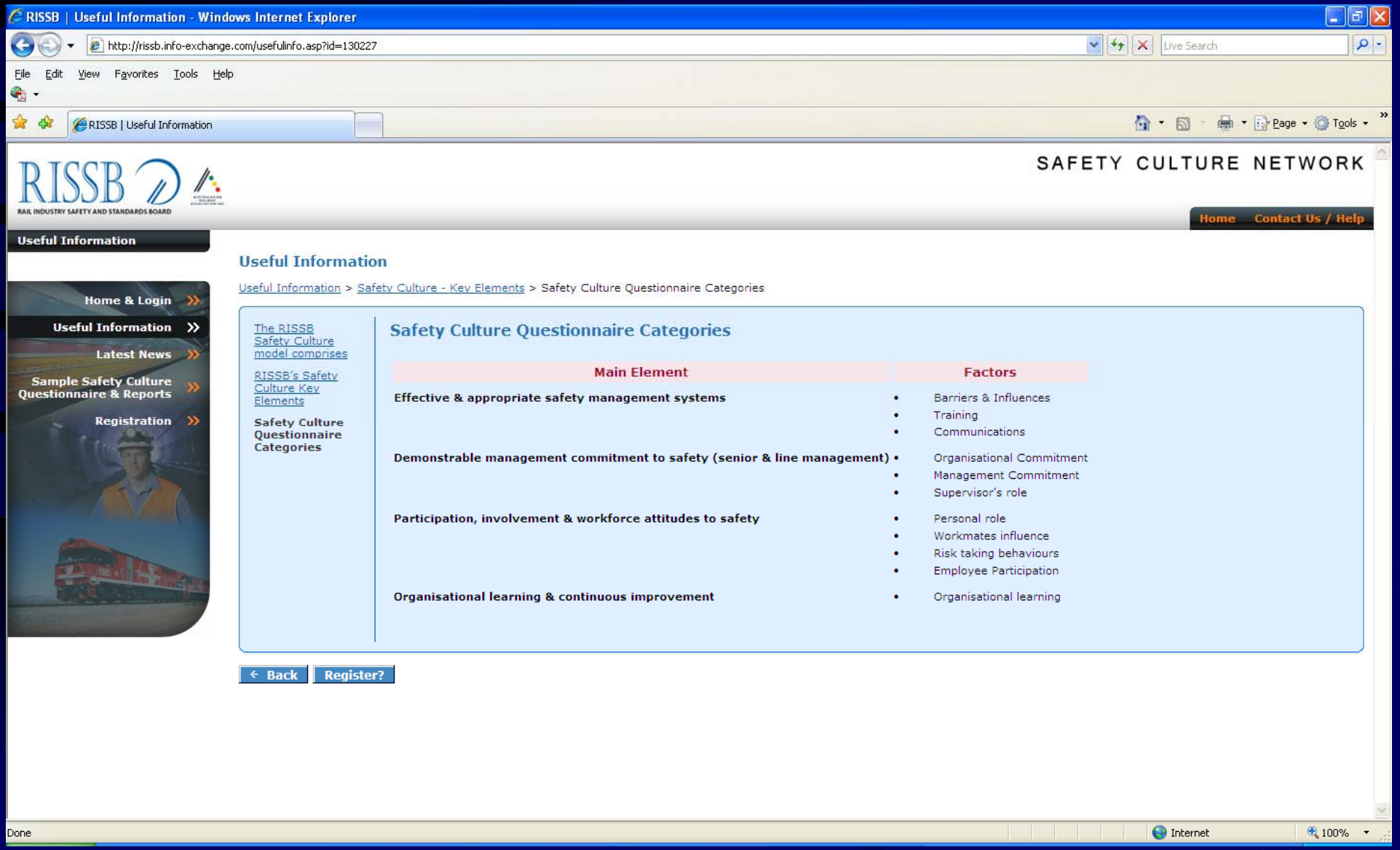
Behavioural aspects are concerned with 'what people do' within the organisation, which includes the safety-related activities, actions and behaviours exhibited by employees. These aspects can also be described as 'organisational' factors.

The situational aspects of safety culture describe 'what the organisation has'. This is reflected in the organisation's policies, operating procedures, management systems, control systems, communication flows and workflow systems. These aspects can also be described as 'corporate' factors. These aspects are displayed diagrammatically in Figure 1, these three aspects of safety culture are interrelated and are not mutually exclusive.

← Back Register?

Internet 100%

SAFETY CULTURE TOOLKIT

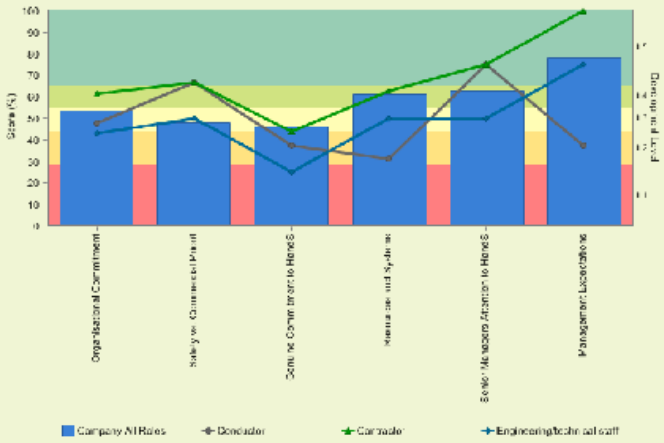


SAFETY CULTURE TOOLKIT

F1 - Specific factors by roles

Company:	Enable Rail Services (Dummy Co.)	**Survey Title:**	CJ Test Survey 1
Date Closed:	23/02/2006 12:33:50	**# Completed Questionnaires:**	8
Date Report Generated	20/10/2006 15:00:55		

Selected Criteria			
Gender	-- All --	**Department**	-- All --
Age	-- All --	**Experience**	-- All --
Factor	"Organisational Commitment"	**Role**	Conductor Contractor Engineering/technical staff
		Location	-- All --



Details for factor

Provides additional insights for this factor showing key findings from the sub-factors and specific questions.

Particularly positive and negative responses (compared with the overall average) for this factor or sub-factor are:

Factor	Score	SC Level	Guidance Notes
Organisational Commitment	53.69	Safety Culture Development Level 3	**Organisational Commitment - Level 3 Response** Enhance relationships between management/workforce by a strong shift to workforce involvement: • Requires managers to have/develop a more facilitative, "human" style • Aided by teamworking; listening & responding to employee issues Review & improve safety leadership by addressing unintentional behaviours (personal & organisational) that detract from safety message The following key aspects of safety management arrangements should be considered for potential improvements: • Risk assessment & hazards/risk awareness • Procedure adequacy & improvement • Removal of barriers to safe behaviours & promotion of safe behaviours • H&S Refresher training and provision of non-work related H&S training to raise the safety profile • The effectiveness of change management arrangements and the communication of change
Safety vs. Commercial Priorit	47.92	Safety Culture Development Level 3	**Safety vs. Commercial Priority - Level 3 Response** May need to investigate how/why H&S priority is being compromised - or could be strengthened
Genuine Commitment to H&S	46.09	Safety Culture Development Level 3	N/A
Resources & Systems	60.94	Safety Culture Development Level 4	**Resources & Systems - Level 4 Response** Use responses to Barriers &Influences to help to identify key areas to address
			Senior Managers Attention to H&S - Level 4 Response

CONCLUSION

- Operators are responsible for safety
- Safe operation is sustainable
- Work continuously on safety improvement
- Error proof the system – consider human factors
- Learn lessons from anywhere you can
- Lock in lessons and don’t forget
- Develop a positive safety culture
- Regulators and Operators need to work together
- Regulators have an important role in education and safety improvement

Thank you.