EMSD Symposium 2011

Symposium on Electrical and Mechanical Safety and Energy Efficiency – Engineering a Safe and Low-carbon Environment

REGULATORY RELATIONS, CULTURE AND SAFETY

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Introduction

Mr Stephen HC Chan
Dr KM Leung and fellow colleagues from EMSD
Honourable Guests and delegates

Thank you - it is a pleasure to be invited here to address this symposium.

I was in Hong Kong last October for the International Railway Safety Conference. I had the opportunity to experience some of your transport system including automatic people movers, trains, trams and many lifts.

I saw many signs like this one showing that safety is important to you.

Your MTR railways are perceived to be one of the safest railway systems in the world and what I saw showed that was probably true.

Someone in MTR told us they controlled everything in Hong Kong --- except the weather.

So yes, they are in control of good railway safety. That is good for all of us because we all value being able to be transported safely.

I am impressed seeing how MTR works to ensure safety and how the EMSD is approaching its job to achieve sustainable railway development and safety.

Here we are all committed to continuous improvement and we can always learn something from each other. I am sure I will learn more from being here again. Those lessons will help me back home and I hope my presentation will also be of some help to you.

We don't have to learn from only our own industry or work place. We can also learn by looking at lessons from events in other industries.

Unfortunately we keep seeing accidents where past lessons were forgotten and previous errors repeated. Just think of ship accidents like the Mary Rose (1545), and the Vasa (1628) and the Herald of Free Enterprise (1987).

History shows that the same types of errors and accidents have been happening for a long time in many industries. There are many published accident investigation reports available around the world and on the internet that prove this point. In transport that is particularly true.

In all accidents reports we see evidence of people making mistakes, operators not managing safely, and safety management systems that should be improved. It is normal to see identification of factors that contributed to these accidents and it is becoming increasingly common to see reports stating that a poor safety culture was a major factor.

In many cases reported contributing factors have been about managers and workers taking risks – sometimes they knew it was a risk and sometimes they possibly didn't know any better because they were just doing things the way they have always been done. This is a reflection on the safety culture.

As a safety regulator I need to know about these things, how to identify them and how to advise rail operators how to improve their safety management. In this presentation I discuss aspects of our strategies to help industry improve safety management.

I have been a railway safety regulator in Western Australia (W.A.) since 1998. I have had the privilege of seeing first hand how a lot of rail organisations operate, including companies in Australian and many other countries around the world.

When I visit and talk to their people I start to get a feeling about their convictions to operate safely and to safety improvement. I make conclusions about whether they have a positive safety culture or not. Some appear better than others. They all tell me they can do better, and most are interested to know about other ways to be safer.

Railways and Safety in Australia and W.A.

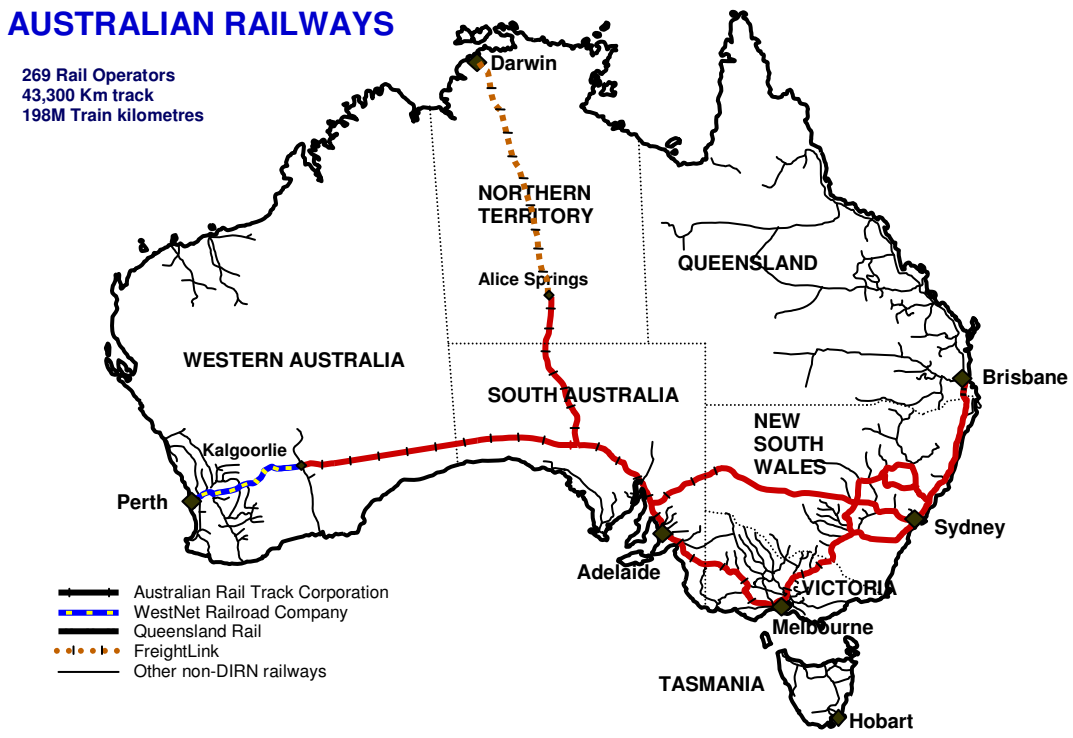
Let me talk a bit about railways in Australia and my home State of W.A. The table below shows some dimensions.

It seems clear that W.A. has more efficient regulation being 8.4% of the national cost of railway regulation while having over 20% of rail activity. W.A. railways also have a better safety record overall.

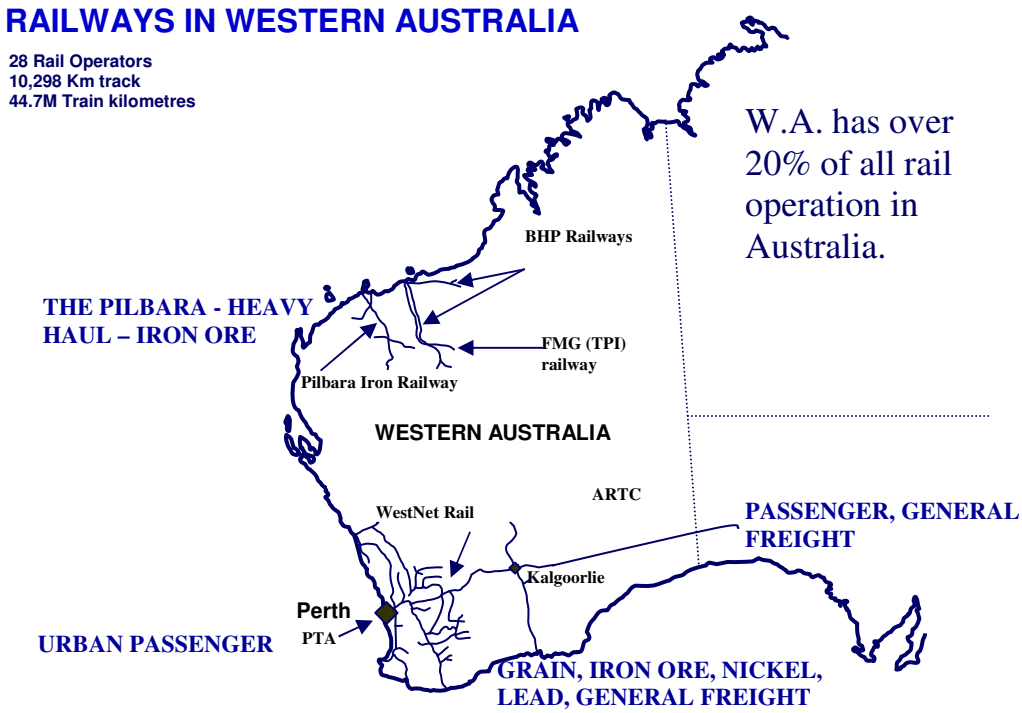
	Australia	**W.A.**	**W.A. Share**
No. Accredited railways	164	28	17.1%
No. Track kilometres	44,948	10,298	23.14%
No. Train Kilometres	198.0 Million	44.7 Million	22.6%
Cost of Regulation	$27.36M	$2.33M	8.4%

The railway operators in WA can take credit for that result. My office works hard to maintain a good working relationship with all railway operators and encourages them in having a continuous improvement approach to safety. This relationship is based on trust which reflects in willingness to share and use information and ideas to help safety improvement.

The following map shows where our railway systems are. All State cities have passenger systems and the networks are linked to allow freight distribution. Many networks reach inland to rail resources to ports for export.

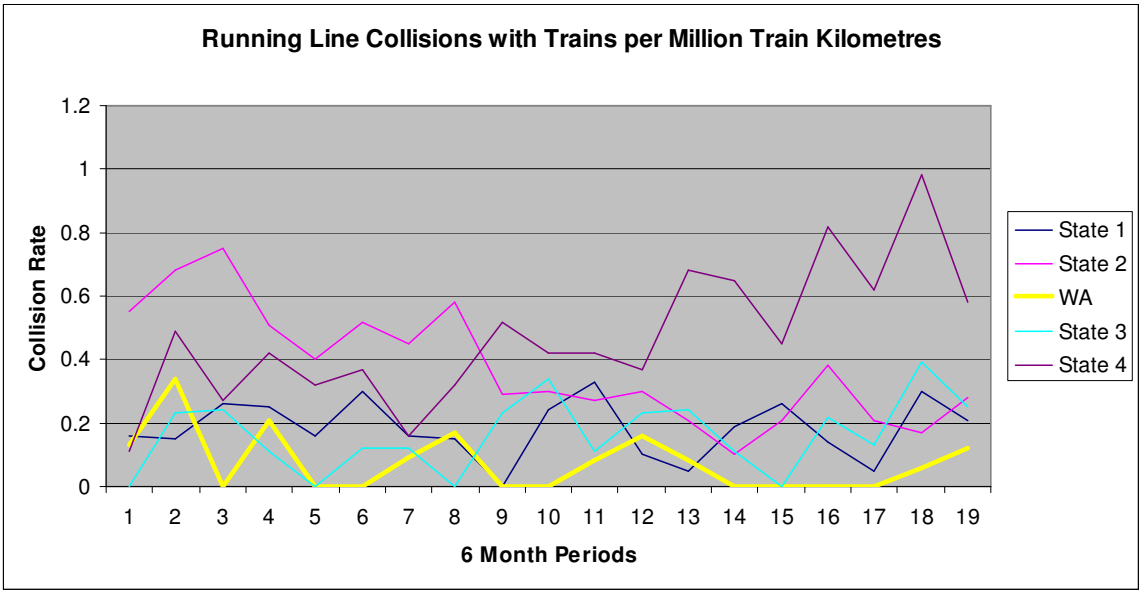


In the following map of Western Australia you can see this in more detail.

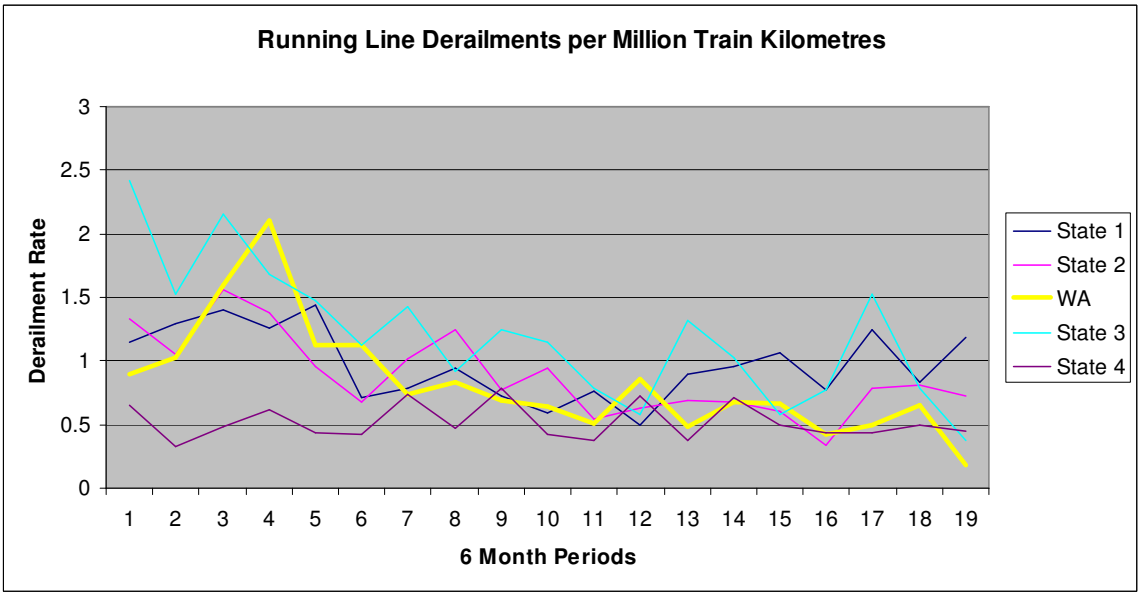


The following graphs show over ten years the safety performance of WA railways compared to railways in other States.

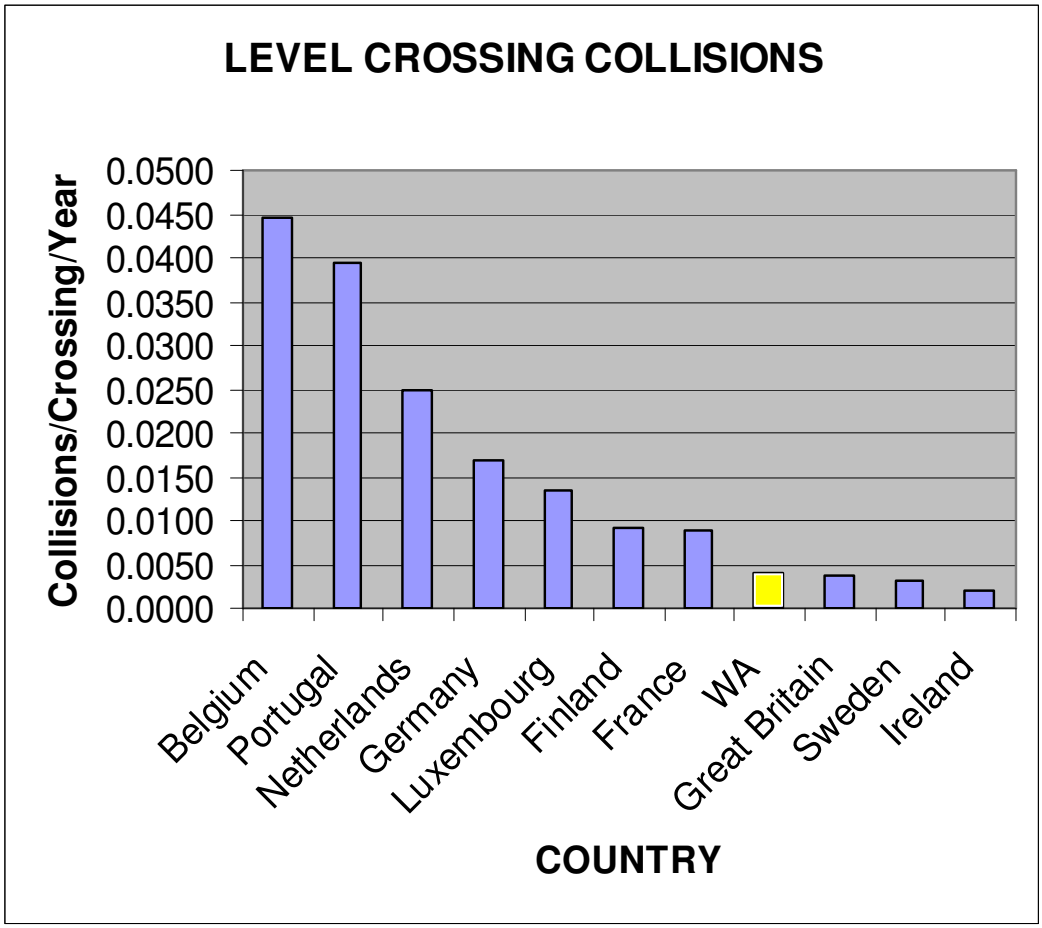
RUNNING LINE COLLISIONS BETWEEN TRAINS



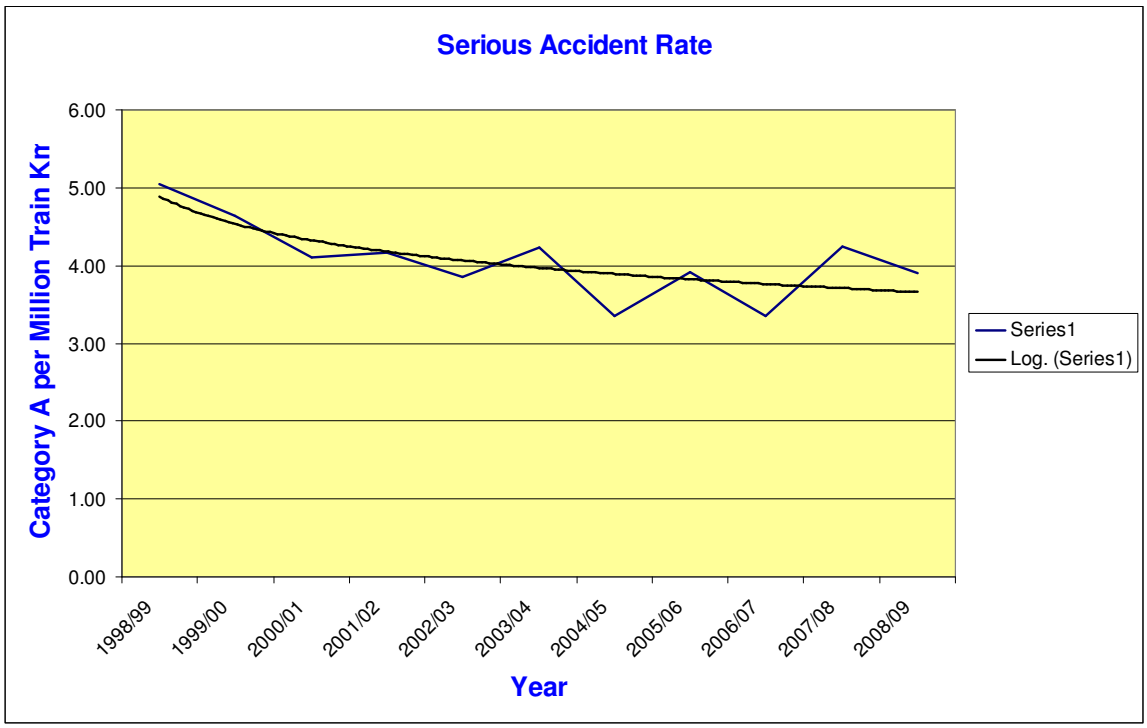
RUNNING LINE DERAILMENTS



We even look overseas to find rail safety data we can benchmark against. The next graphs show our level crossing safety compares well against railways in Europe.



Our other safety indicators are also very good. This next one shows that the rate of serious accidents has improved about 30% in the last ten years.



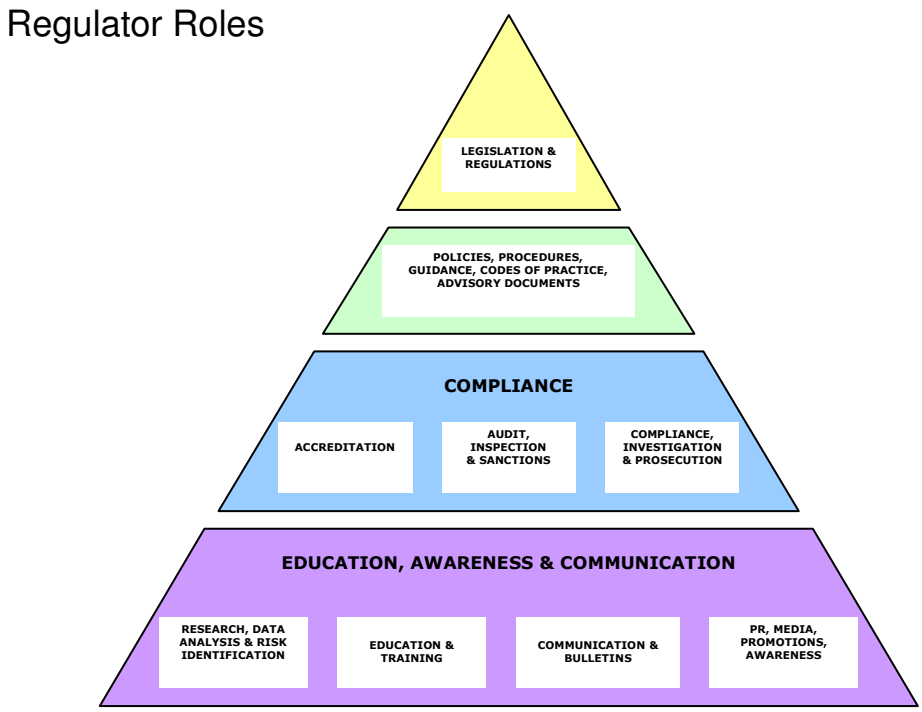
Let us now look at how we are organised to regulate rail safety in Australia.

Rail Safety Regulation in Australia.

I head the Office of Rail Safety (ORS) which regulates railway safety in Western Australia. Each other State also has a government rail safety regulator. We regulate safety of railway operations. We are not the occupational health and safety regulators.

Regulators in all States have to administer similar law and apply similar standards and guidelines. All regulators from each State work together to improve consistency in our regulatory approach and to improve safety. We regularly meet to do this in a forum called the national Rail Safety Regulators' Panel which I currently chair.

As rail safety regulators we have similar roles. These are depicted in the following diagram.



Different Regulators have put different emphasis on which roles they choose to focus their attention. Some are more compliance focussed while we have been more inclined to audit and work with the operators with a view to finding where the operators can improve their operating systems.

We see we have a key role in helping to improve railway safety and we believe we have been successful in doing that.

So roles along the bottom of the triangle including research, education, awareness and communication roles are very important and this will increase as we go forward.

What do we regulate?

The ORS regulates the safe operation of trains in all railways defined in the Rail Safety Act. This includes any railway with a track gauge of 600mm or more. Small trains operating in fair grounds and fun parks, horse drawn trams, slipways, aerial cable operated systems and railways only used to guide a crane or used solely for fairground amusement are exempted.

In W.A. we regulate a very diverse range of rail operations. They include:

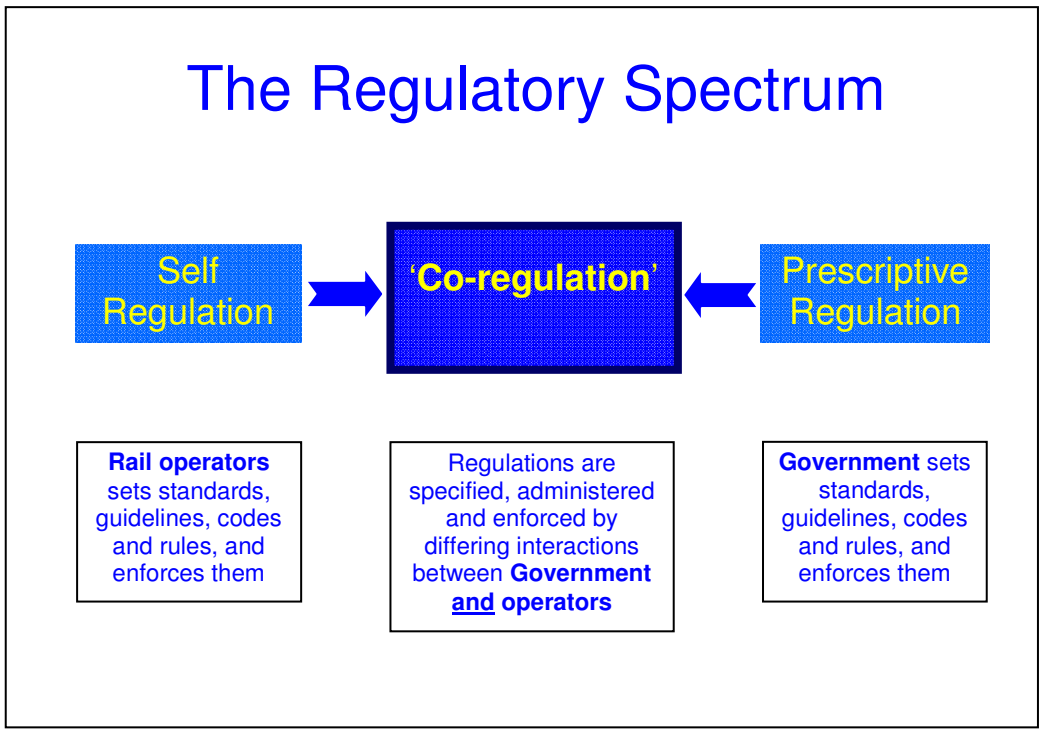
- Urban passenger system in Perth
- Southern freight network
- Interstate freight and passenger operators
- Private railways for iron ore export in the North West of WA (the Pilbara) operate some of the largest heavy haul trains in the world.
- Three heritage steam train operators
- Small tourist tram operators

- Other unique tourist trains

Co-Regulation

Our Rail Safety Act 1998 was replaced by a new Rail Safety Act 2010. While these Acts have some key differences they have as their fundamental basis a style of regulation we call CO-REGULATION.

Co-regulation means we are not a prescriptive regulator, nor do we let operators regulate themselves. We sort of sit between those two extremes as this diagram shows.



The Rail Safety Regulators Panel has prepared a definition of co-regulation and this definition is on the RSRP website:-

> "Co-regulation is a form of regulation that establishes a set of principles for sharing or assigning responsibilities between government and industry (in our case) for the management of rail safety risks.
>
> Codification of these principles in the rail industry at the national level is through the National Model Legislation. A rail safety regulator administers this legislation in each jurisdiction. The relationship for co-regulation is therefore not between the regulator and industry but is a complex interaction between governments and industry covering the stages of policy development, specification of legislation, through to administration and enforcement. The regulator's primary relationship is with individual rail operators and others who have responsibilities under the rail safety legislation. At a practical level, the exact nature of the co-regulation relationship between regulator and regulated changes

depending on the nature of the legislative obligation (e.g. accreditation, safety duties, risk management obligations etc.)"

Anecdotally it appears that the rail industry perceives each of the rail safety regulators in each State differently. They have been described variously as 'heavy handed with a police mentality" through to "light handed toothless tigers".

In WA we hope to be seen somewhere in between those extremes – being firm but fair and helpful.

This is important because it is our belief is that safety improvement hinges on a good relationship between regulators and rail operators and their contractors as well as unions and railway users. The type of relationship can affect the safety culture within the rail organisation.

Safety Management System

The Rail Safety Act requires all railway operators to obtain safety accreditation from my office before they can legally operate their railways. 'Accreditation' is really a license to operate. To gain accreditation the operator must have a robust safety management system (SMS) The SMS is a fundamental CORNERSTONE of our regulator system.

Apart from exceptional circumstances the Regulator does not set safety standards. Under co-regulation each railway operators is responsible to sets it own railway safety and operating standards to control safety risks to ALARP. Each operator must do that itself to suit their particular operations. This includes describing the technology, standards, codes, guidelines, rules and procedures that will be applied to eliminate or control those risks.

The operator's proposed SMS is reviewed by experienced rail and engineering experts in my office and if it is considered that the railway operator has developed an appropriate and robust SMS and met other requirements then I accredit them to operate.

We see the operator's SMS as it's commitment about WHAT IT WILL DO TO CONTROL RISKS. We then audit their operations annually to see they are doing what they said they would do.

In developing their SMS all rail operators in WA followed the requirements set out in an Australian Standard called AS4292 Rail safety management. This standard provides a framework for an SMS and I chair the national committee that is responsible for its development.

Monitoring management of railway safety.

As previously mentioned Regulators have a role to audit railway operators to see they are DOING WHAT THEY SAID THEY WOULD DO in their SMS. We audit every railway every year.

Over time it has been interesting to observe the different approaches by the various management teams as we move from one company to another to audit or inspect their operations.

We not only see if they are complying with their system but we also get a feel for how they are managing and how the workers are embracing safety as part of their work.

We observe they are all different as these examples illustrate:-

- some were making improvements and had a system to keep reviewing things to see if they could do better, but some others didn't do this;
- those that were improving seemed to exhibit good leadership and an element of stability;
- Those not doing as well at some time often had a lot of change in management or organisation or lost significant leaders;
- Some didn't seem to always take safety seriously;
- Some gave the impression of a commitment to safety and said what they were about to do to improve safety but didn't seem able to implement change;
- Investigation of accidents by some was done will great detail in search of what really contributed to causing the accident. Others would go out and look, make a quick decision about the cause such as blame the track condition or driver error and focus on clearing the wreckage to quickly get train running again. This was a hangover from old practice.

But we also found that sometimes what we thought we were looking at was not really what was happening. The mind can plays tricks. Thinking can be affected by preconceptions or previous experience and so it can build pictures that are not always right. We found we needed tools to help us assess things such as safety culture.

E.g. we may hear a good presentation from management about what it is doing to improve:

- training
- promoting safety
- rewarding good practice
- etc
-

These are all good things that contribute to having a positive safety culture that will bring sustainable safety improvement.

Unfortunately we then go out to accidents and on investigation we sometimes find things like:

- A person wasn't trained
- Worker instructed by supervisor to do things the wrong way.
- Procedure or rules not followed
- Short cuts were being taken
- Fatigue – driver was asleep
- etc

By contrast in other cases we find the extreme opposite:-

- stopping operations until all possible evidence could be extracted

- analysis of evidence in great detail
- identification of causes and contributing factors
- working hard and investing lots of resource to improve the system to remove the risk

This shows a real commitment to finding the causes and contributing factors of an accident.

Examples of the variation between some operators we have seen follow:

Major established operator

- CEO meets all new staff on day one. They can't start work in the company until he has talked to them about the importance of safety and their responsibilities to be safe and ensure their fellow workers stay safe.
- Workplaces are clean and well organised at all times – everything always in its place. A better place is a safer place.
- All workers are required to report risks.
- All managers are required to work together to resolve and remove identified safety risks.
- Risks are ranked for priority treatment.
- Each manager is allocated responsibility for particular improvement projects and to work with workers to fix the problems.
- Each manager must report at the managers' group meeting on progress with their improvement projects.
- Major investments are made to make sure errors and risks from accidents can't happen again:

A medium size operator:

- A new SMS with many good looking procedures and everyone trained
- A brand new workplace in which it looked like everything was right.
- 3 serious accidents in three years – collision, derailment and a near electrocution. People were taking short cuts and making errors.
- Obviously things were not what they appeared.
- Some safety behaviours were not right

A larger operator:

- A well established SMS
- Problems getting and retaining staff in competitive market
- Staff under pressure
- Concerns about training
- A locomotive derailed because flange broke off. A manager sent it back into service after it was brought in for service to replace wheels and before it was fixed.
- A train collision where drivers didn't follow the rules and may have been fatigued.
- A train arrived very early and the driver calculated to have been speeding
- Fires on several locomotives after substandard electrical components were fitted causing heating and fire.
- An accident where rules and procedures were not followed and a worker died.

- Some workplaces often not tidy and with safety hazards. We inspected one after being told it was cleaned up and found the same problem.

Regulators in other States were having similar experiences. These sorts of problems had helped drive the 2006 review and improvement of AS4292 which was first published in 1996.

Obtaining More Safety Improvement.

By 2005 rail operators were gaining experience under the new co-regulatory environment but application and results were mixed. The Regulators decided more could be done to improve the system and we identified several strategies to improve safety.

Firstly we decided that to help improve safety management we needed to updated AS4292 to include several key new or strengthened SMS requirements including:-

- Enhanced risk management requirements
- The concept of managing risks to ALARP (As Low as is Reasonably Practicable).
- A continuous improvement cycle for safety management
- Human Factors management
- Safety culture requirements
- Requirements for consultation with those people working in the system
- Requirements concerning accident investigations and preserving evidence to find contributing factors. Also encouraging a more systemic approach to investigations and a no-blame or just culture approach.

Many of these enhancements are based on the philosophies of TQM where process management, continuous improvement and worker involvement in change is fundamental.

We added these enhancements after several years experience getting railways to implement their SMSs and observing what they were doing. We had developed a strong belief that further safety improvement must come from operator better managing risks, improving their understanding of human factors and achieving a positive safety culture in their organisations.

During my work experience prior to moving to rail I had been a national Councillor of the Australian Quality Council for10 years and had responsibility for implementing TQM into three government departments. So now working in rail I had the opportunity to add my experience of requirements for management excellence into railway safety management practice nationally.

AS4292 had six parts. The first described SMS requirements and the rest outlined the key elements required in systems for safe management of rolling stock, infrastructure, signalling, communications systems and railway operations.

When AS4292 was republished in 2006 a new Part 7 - Rail safety investigation – was added and published. It included the outline of a best practice process for rail accident investigations and encouraged systemic, no-blame investigations to find the causes and contributing factors. This was important because knowledge of common contributing factors could help identify further areas for safety systems improvement.

Many regulators now systematically require operators investigating accidents to apply the process in and to report on the investigation in accordance with Part 7.

The Regulators also worked with the RISSB to develop a Code of Practice for Rail Safety Investigation that included a comprehensive range of guidance material and investigation tools.

Recently we have been receiving rail investigation reports that identified contributing factors. But we didn't have a systematic method of categorising and recording these contributing factors to identify any trends or key risk areas to address.

Also we were now clearly seeing the need to provide or help industry get equipped to work on improving their organisation safety culture.

Safety Improvement Tools

After updating AS4292 the Regulators agreed there was a need to build on the enhanced SMS foundation and investigation improvements it contained. It was now important to find ways to assist all operators to achieve a better safety culture focussed on continuous improvement. Several projects were initiated but the following three were considered to be key:

Contributing Factors Framework (CFF)

A contributing factor is any element of an occurrence which, if removed from the sequence would have;

- Prevented the occurrence, or
- Reduced the severity of the consequences of the occurrence.

In an accident it is rare to have a single contributing factor.

Contributing factors can therefore be precursors to accidents. AS4292.7 had been produced to require identification of contributing factors during safety investigations. Now we needed a means to collect and classify them so they could be analysed just like we do with normal accident data. So we put a team together to develop the CFF and I chaired this for the first two years of its development. It is based around the accident analysis thinking of James Reason that you should all be familiar with.

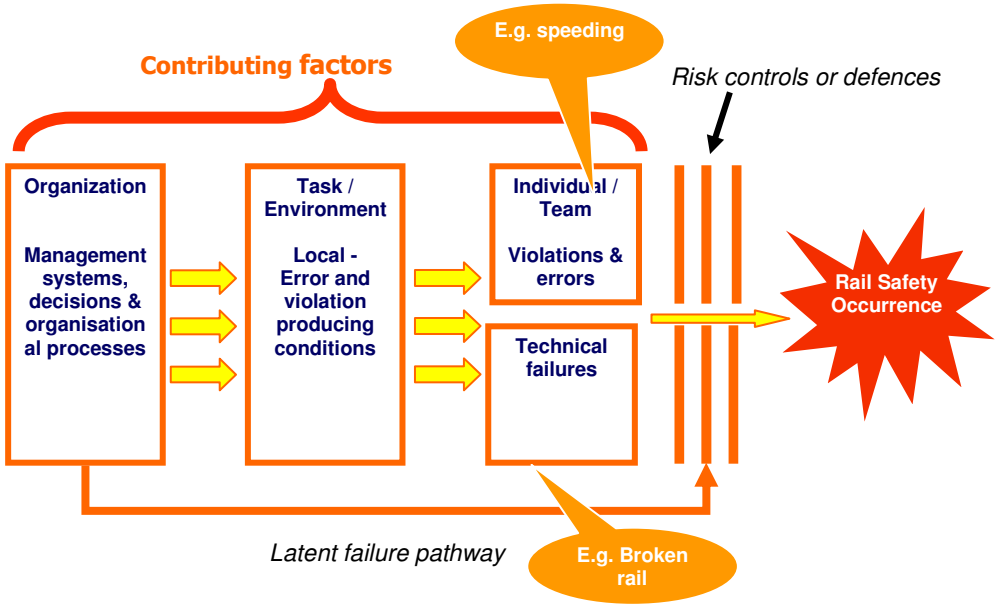
The CFF is therefore a consistent, structured framework which enables rail safety investigators, rail transport operators and Regulators to record and analyse the contributing factors identified during the systemic investigation of rail safety occurrences.

The CFF we developed suited our rail environment and includes factors in the following categories as per the following diagram:

- Organisation
- Task /environment
- Individual/Team Actions
- Technical failures

The CFF is based on the following accident causation model which may be more familiar when represented like the "Swiss Cheese Model".

Contributing Factors Framework

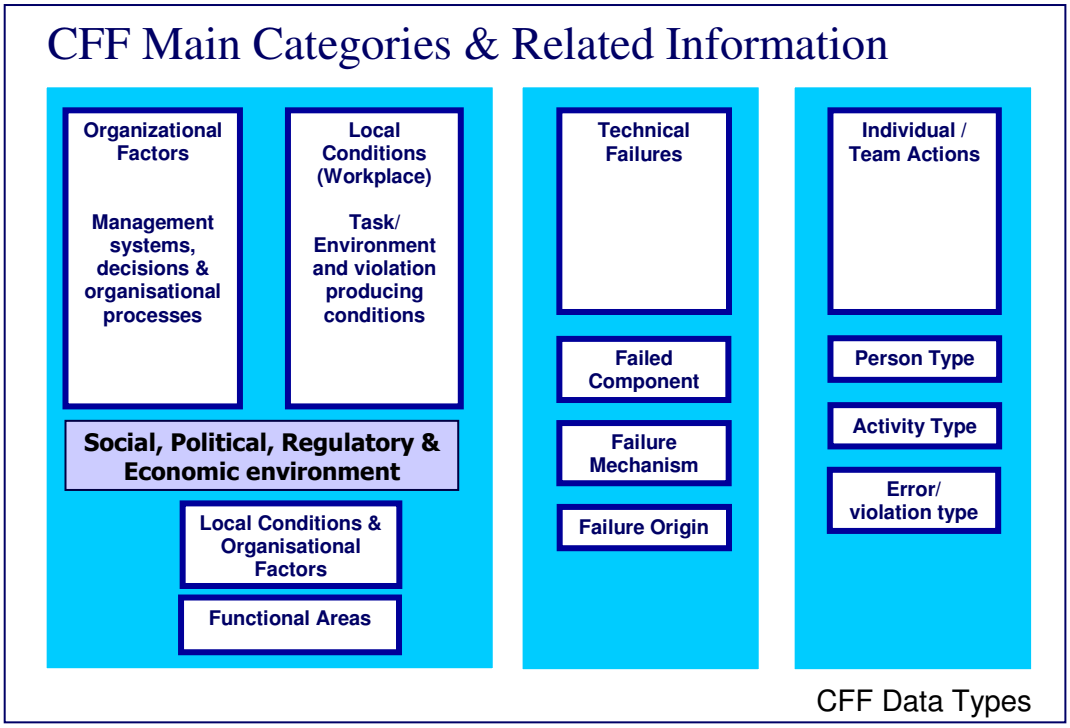


Following this model we developed the following framework in greater detail. Each category shown has a lot of sub elements all of which have detailed definitions to help in classification of the contributing factors. The CFF is published in a comprehensive Contributing Factor Framework Manual that can be seen on the internet at: http://www.rsrp.asn.au/publications.cfm?pub_id=16

The CFF will allow Regulators and rail transport operators to collect systemic safety data so that the organisational basis of safety issues can be identified, analysed for patterns and trends, and acted upon.

Understanding contributing factors will assist in improving the knowledge, understanding and application of human factors in safety management.

When collected by regulators it allows identification of broader industry safety issues. Regulators will then be able to work with industry to develop safety improvement strategies.



The CFF compliments the principal documents used by Regulators and operators for occurrence reporting and investigation within the rail industry including the rail accident reporting Standard ON-S1; the accident classification guideline OC-G1; the Code of Practice for Investigation and AS 4292.7.

Expected benefits to be derived from the introduction of the CFF include:

- The potential to enable the comparison of contributing factors across participating organisations and/or jurisdictions;
- Aggregated data will permit the identification and analysis of safety trends;
- Access to detailed information pertaining to the systemic issues associated with rail safety occurrences will enable the implementation of better safety solutions; and
- Continuous improvement to systemic investigation skills and process procedures will be encouraged.

A training package was developed and Regulators in each State have taken the training out to several operators in their State to encourage them to use it.

The investigators are being encouraged to use the CFF definitions to help consistently identify contributing factor types and to code them on a specially designed coding sheet (see below).

As investigation reports that identified contributing factors started coming in Regulators decided to develop a suitable database system to capture and systematically store the information.

All Regulators had databases to record reported 'top events' and some precursor events. They now needed better databases to record contributing factors and allow them to do trend analysis. This would assist them in identifying sustainable safety improvement strategies.

A CFF database to capture contributing factors has now been developed to capture the contributing factors recorded on coding forms in the Manual and all Regulators are trialing its usefulness. The input screen reflects the coding form and for ease of use has drop down fields to select from.

The Victorian Regulator has tested the system by coding contributing factors from 95 accident reports produced over a ten year span and produced a preliminary assessment of the types of errors or unsafe acts over that period. This has indicated that some particular contributing factors were more prevalent and this could give rise to development of new improvement strategies.

The following pictures show the coding categories in more detail, the coding sheet and the data capture screen on the CFF database.

Contributing Factor Categories

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 Coding Sheet

Appendix 1 ~ 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	Failure mechanism	Failure origin

LOCAL CONDITIONS & ORGANISATIONAL FACTORS

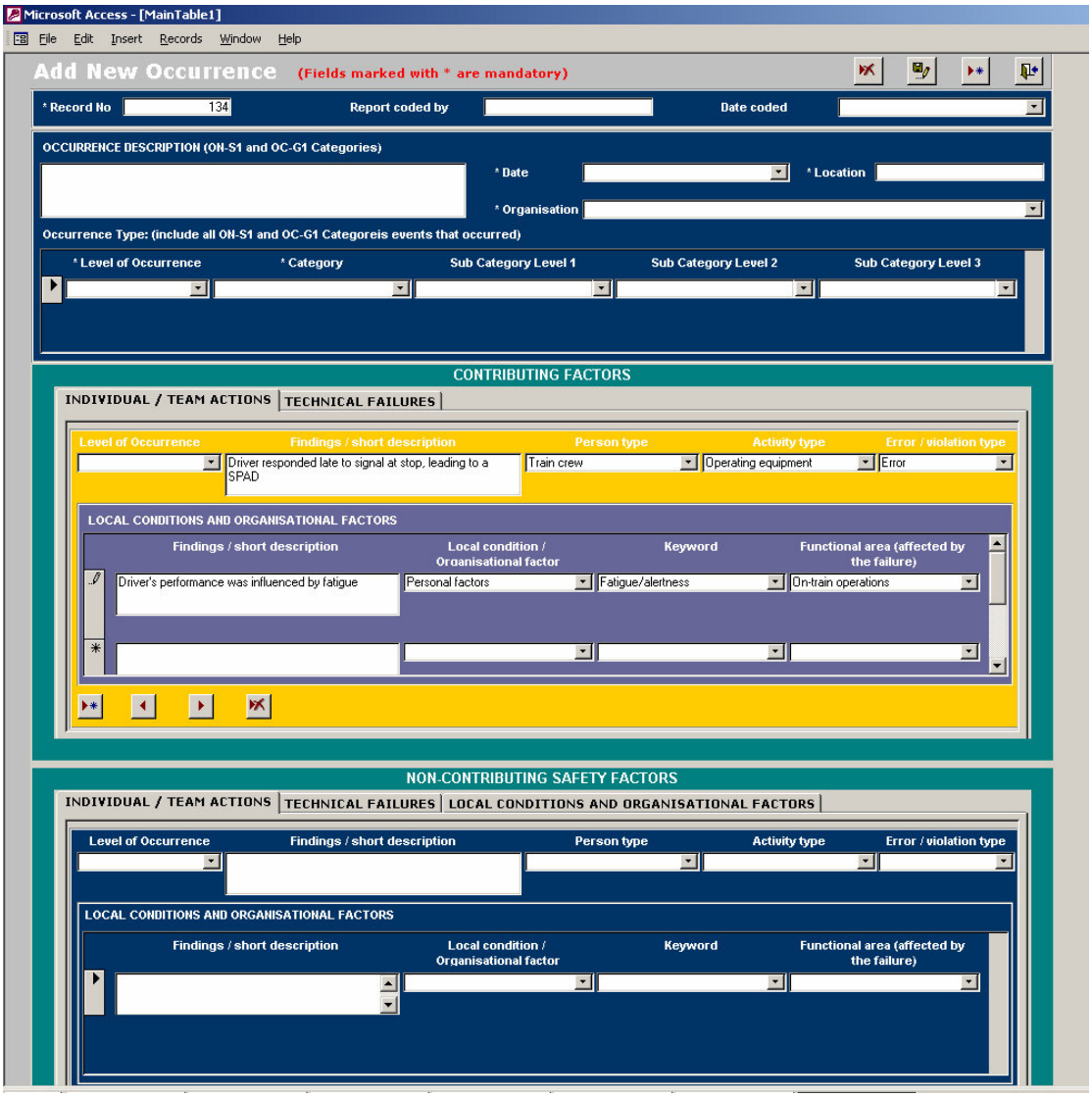
Findings/short description	Local condition/ Organisational factor	Keyword	Functional area (affected by the failure)

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 Keyword]	**[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 Factor Database – Data Entry Screen



Rail Resource Management (RRM)

Given the high proportion of rail accidents where human error has been a key contributing factor the RSRP decided to develop a strategy to reduce human error. It decided to develop a program called RRM which is based on the aviation system called Crew Resource Management (CRM). The maritime industry has also adapted CRM to suit them is a system called Bridge Resource Management (BRM).

The RSRP was aware of work in some North American railways several years ago to implement CRM in their businesses but decided it needed to develop something suited to the Australian cultures and environment.

In the aviation industry CRM has been a mandatory training program worldwide for commercial aircrew since around 1990. Training is normally undertaken annually and is aimed at reducing human error that can cause accidents.

It was agreed that RRM be designed to improve railway safety by assisting rail safety workers to improve their situational awareness and particularly interpersonal communication, leadership skills and decision making in the cab, train control centre and other workplaces. This will enable people to manage hazardous situations and errors.

The RSRP through the Victorian and New South Wales Regulators engaged Dédale Asia Pacific to develop comprehensive Guidelines for RRM. A training program was developed for rail safety workers with input from industry representatives and the Australasian Railway Association. The program is endorsed by the national RSRP.

The Guidelines include a CD with an RRM Training Toolkit

The toolkit is really well organised and addresses key competency elements for RRM such as:

- Leadership
- Task Management
- Teamwork
- Communication
- Risk Management
- Situational Awareness
- Decision Making
- Emergency Management and
- Self-Management

It includes a basic safety culture self-assessment questionnaire based on a survey developed by Professor James Reason for evaluating the nature and strength of an organisation's safety culture.

Each module contains:

- practical discussion on the theory
- major exercises
- lots of examples of real railway case studies to illustrate the issues

- exercises to practice on.

RRM is about:

- Training to develop strategies to reduce the frequency and consequence of errors;
- Improving communication skills;
- Cross checking and monitoring;
- Training for error detection and recovery; and
- Having transparent feedback systems.

It aims to establish three lines of defense:

- AVOID – prepare, plan, brief;
- TRAP – enquire, cross check, read back, vigilance; and
- MITIGATE the consequences – decision making, task prioritisation, checklist management.

RRM addresses key elements for a good safety culture such as leadership and safety behaviours:

- Responsibilities;
- Involving others;
- Having the right authority;
- Following procedures and directions;
- Intervening; and
- Decisive action.

It is recognised that any rail safety worker may be required to take a leadership role at any time.

Subsidised training sessions were run to enable people to become RRM facilitators during October and November 2010.

A non-mandatory program for RRM training for rail safety workers has been made available without cost to rail operators and organisations conducting rail safety work.

The detailed guidelines also include comprehensive training material for training facilitators and for facilitators to use. This includes exercises supported by examples of real rail accident case studies.

The "Guidelines for Rail Resource Management" have been published and can be found on the RSRP website at http://www.rsrp.asn.au/files/publications/2_9..pdf

More detail is also published on the New South Wales Regulator's (ITSR) website at: http://www.transportregulator.nsw.gov.au/rail/safety-improvement/rail-resource-management-rrm

To be successful RRM needs solid commitment from the rail organisation and the RSRP recognises that.

To assist in demonstrating its value to the rail industry the RSRP asked the NSW and Victorian Regulators (IRSR and TSV) to commission a project to support implementation of a pilot RRM program at V/Line, a major operator in Melbourne. The aim was to help V/Line implement a best practice version of RRM, to monitor and review the implementation process, and to evaluate the effectiveness of the V/Line course. Dédale Asia Pacific undertook this project. An evaluation report on this project was prepared to disseminate the lessons learned to the rest of the rail industry that may be interested. A progress report presented to Regulators in mid 2010 showed progress and a cost benefit analysis as well as performance improvements at V/Line. It is hoped that other rail operators watching this trial will adopt RRM in their operation.

Safety Culture Toolkit

The RSRP believes that achieving a positive safety culture in a railway is another cornerstone to continuous safety improvement.

It is important for rail managers to really understand the safety culture in their organisation and how to improve it.

As mentioned earlier, Regulators regularly audit, inspect and investigate rail operation and have meetings with rail managers. We develop impressions of their safety cultures but as discussed before these perceptions can be wrong. It is important to have a better way to get past the rhetoric to understand what is really going on.

There are key elements required for a good safety culture to exist and they can be measured. A scan of the internet will show a vast range of information about safety culture and tools to measure and improve it. We needed a suitable tool to use in Australia. Work was being undertaken at one university to develop a safety culture tool for the rail industry but it would not be finished for some time.

The New South Wales rail safety regulator then examined an assessment tool developed in the UK that the UK regulator is encouraging its rail operators to use. This tool is owned by the UK's Rail Industry Standards Board (RISB) – not to be confused with the Rail Industry Safety Standards Board (RISSB) in Australia.

The toolkit helps identify areas where rail operators can best focus their efforts to get sustainable improvement in safety. It contains questionnaires which are used to assess the level of culture in several key elements that define safety culture. Results from questionnaires are fed into a computer system.

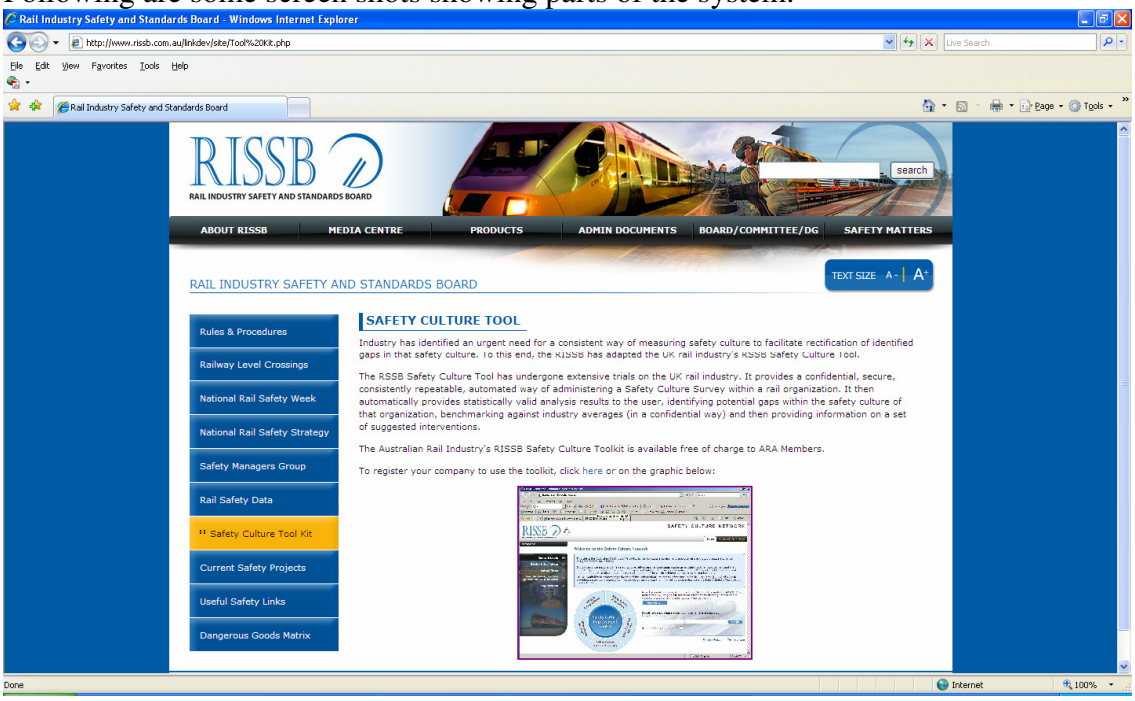
As data builds in the system it is possible for individual operators to benchmark their level of culture development and for the industry/RISB to identify elements where it will be beneficial to develop specific programs to help operators improve.

At RSRP we strongly believed that the RISSB in Australia must take a lead with helping the rail industry improve safety culture. RISSB was encouraged to do something about it and eventually with substantial funding from the NSW Regulator

(ITSR) the RISSB obtained a license from the UK's RISB to use their safety culture toolkit in Australia.

The toolkit is on the RISSB website and rail operators can register to use it. The website is at http://www.rissb.com.au/linkdev/site/Tool%20Kit.php

Following are some screen shots showing parts of the system.



The toolkit works in a similar fashion to most behavioural based surveys.

There are 6 main dimensions to this scale and each has a number of factors. The aim is to profile the organisation on each of the 15 factors.
The dimensions and factors are:

- Safety Values, Beliefs and Assumptions
  - Responsibility for safety
  - General attitudes, beliefs and values regarding safety
- Leadership and Safety
  - Leadership and Supervisor's approach to safety
  - Safety communication between you and management
  - Safety communication between you and your supervisor
  - Cynicism
- Structure of Safety (The Social Meaning of Safety)
  - Structure of safety in the organisation
  - Safety environment
  - Communication within the Organisation and between divisions concerning safety initiatives
- Cognitive Styles
  - Thinking styles (experiential vs. rational)
  - Consideration of future consequences
- Behavioural Norms
  - Group interactions
  - Colleagues' awareness of safety rules and procedures
- Drivers of Safety Performance
  - Priorities
  - Driving force behind safety culture

Participating rail operators can issue safety culture survey questionnaires to individual employees which are received and stored in national database on a confidential (de-identified) basis.

The RISSB sees value in the toolkit as it allows industry participants to benchmark their culture levels with other participants. In October 2010 RISSB reported that 32 organisations have signed up to use the toolkit and ten are using it.

The following page from the RISSB website examples the sort of benchmarking information an operator may receive.

While the current data collection is not large it is already showing areas of weakness in aspects of some rail organisation leadership, communication and training systems. These could become areas where the RISSB could work with industry to develop safety improvement strategies including training for industry.

Sample Benchmarking Output from the Safety culture Toolkit.

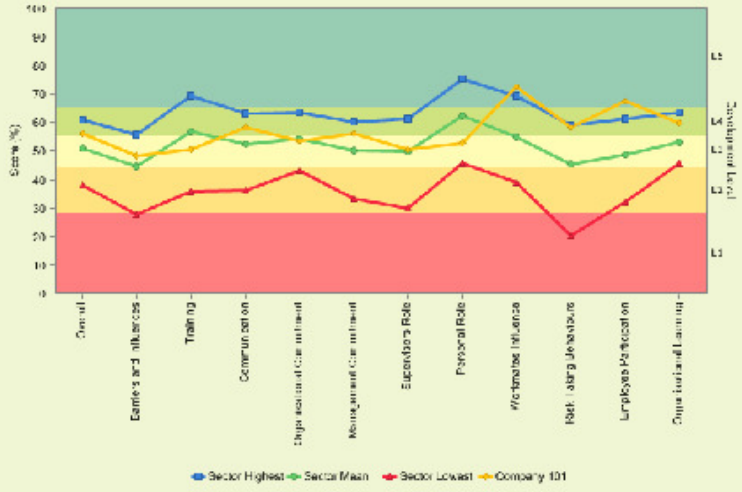
Benchmarking

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 15:03:03		

Selected Criteria	
Operating Sector	-- All --

No. of Organisations

	Sector Lowest	Sector Mean	Sector Highest	Company 101
Overall	38	51	61	56
Barriers & Influences	27.78	44.51	55.58	48.26
Training	35.71	56.8	69.29	50.45
Communication	36.11	52.38	63.06	58.33
Organisational Commitment	43.18	54.31	63.31	53.69
Management Commitment	33.33	50.3	60	56.25
Supervisor's Role	30	49.82	61.42	50.63
Personal Role	45.83	62.5	75.42	52.6
Workmates' Influence	39.06	55.06	69.38	72.66
Risk Taking Behaviours	20.24	45.32	58.86	58.48
Employee Participation	32.14	48.81	61.43	67.41
Organisational Learning	45.6	53.26	63.61	59.72



Conclusion

In regulating railway safety we have focussed on implementing a co-regulatory system that to be effective relies on cooperative relations between the Regulator and operator.

The Operators have been required to implement safety management systems and to manage risks to ALARP. Safety data shows there has been some improvement in safety performance and that safe operation is sustainable.

However continuous improvement in safety can only be achieved by achieving a positive safety culture where every worker is focussed on managing risk and errors.

The Regulators have developed tools to capture information on contributing factors to help identify areas or issues where new safety improvements strategies should be developed. The CFF will let us learn lessons from accidents. The RRM strategy will help improve safety culture. Both will assist railway operators in the quest for improvement and management of error.

The Safety culture Toolkit promoted by RISSB will also assist railway operators to identify safety issues and to benchmark their level of safety culture with other industry participants.

In all this the Regulators through the RSRP have demonstrated the value of co-regulation and the importance of their role in education and safety improvement.

I have given you an overview of my role as a Regulator and thoughts on what is important in moving the SMS forward to improve safety.

As a Regulator I am always keen to share experience so we can all improve how we manage and help other to be safer.

I wish you a successful meeting and in your own quest to build a safer environment.

Again thank you for this opportunity to share our safety lessons.