Rail Safety Regulators' Panel

Capturing the Essential: The Contributing Factors Framework (CFF)

Briefing Content

- What is it - Setting the Context
- Looking beyond the framework
- What does the CFF consist of
- How to Apply

Part 1

What is it - Setting the Context

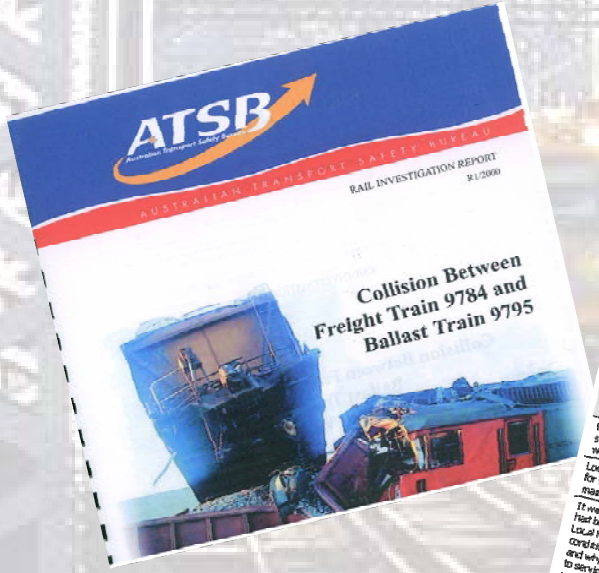
Looking beyond the framework

What does the CFF consist of

How to Apply

Rail Safety Regulators' Panel

What is the CFF?



Record No: (this is the number of the occurrence in your database)

Report prepared by:
Date prepared:

OCCURRENCE DESCRIPTION (ONRSI categories)

A mainline locomotive derailed in the yard of a maintenance facility due to the flange on one wheel breaking away from the wheel rim

Date:
Location:
Organisation:

Occurrence type:	Occurrence Cat.	Occurrence Sub Cat:
Derailment	Yard derailment	Rolling stock irregularity

INDIVIDUAL + TEAM ACTIONS

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

TECHNICAL FAILURES

Findings/Short description	Component	Failure origin	Failure mechanism
Wheel flange fracture had occurred due to the flange and tread wearing beyond acceptable limits	Wheel	Maintenance	Wear

CONTRIBUTING FACTORS: LOCAL CONDITIONS & ORGANISATIONAL FACTORS

Findings/Short description	Local condition/ Organisational factor	Keywords	Functional area (affected by the failure)
Field staff and Maintenance staff were not clear on what wheel condemning limits were	Procedures	Lack of clarity	Maintenance
Local Manager unfased locomotive for service even though urgent maintenance required	Social environment	Diffusion of responsibility	Maintenance
It was not clear what information had been communicated to the Local Manager relating to the condition of the locomotives wheels and why the locomotive was taken to service when safety maintenance was required	Organisational management	Communication & consultation process	Maintenance
Procedures for the measurement of locomotive wheels and the associated management actions not clearly documented	Procedures	Lack of clarity	Maintenance
Roles and responsibilities of Maintenance Manager and Local Manager not clearly defined	Social environment	Diffusion of responsibility	Off train operations
Maintenance Manager felt that he was not authorised to override operational demands even if safety maintenance was required on rolling stock	Social environment	Diffusion of responsibility	Maintenance

A structured framework for capturing & categorising the systemic contributors to rail safety occurrences

Rail Safety Regulators' Panel

What are the benefits?

- Assist in identifying the **sources of problems**
- Aggregate data allows analysis of **trends**
- Consolidation of data at State and National level
  - Assist in making informed decisions which enables **more sustainable solutions**

Rail Safety Regulators' Panel

Example

- Provide example from accident
- What the findings say..
- What is captured and coded in a database for further analysis

Rail Safety Regulators' Panel

Investigation Tools used in Rail Industry

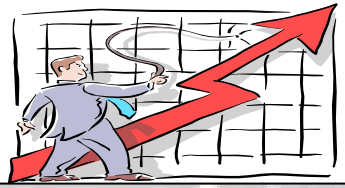
- **AS 4292.7**
  - Provides guidance for conducting a systemic investigation process
- **COP Rail Investigations Manual (ARA)**
  - Provides high level process for conducting systemic investigations
  - (Contributing factors are an output)
- **ON-S1**
  - Captures occurrence type (event information)
  - (Interfaces with CFF)
- **CFF** captures the contributing factors from the findings in the investigation report

Rail Safety Regulators' Panel

Where does the CFF fit?

Rail Safety Occurrences result in ON-S1 Notification of occurrence – (NO CFF APPLIED)
Rail Safety Occurrences requiring investigation are subject too systemic investigations eg. AS 4292.7

Systemic investigations lead to the identification & documentation of findings and contributing factors



Coded CFF data allows aggregate CFF data to be analysed to identify patterns

Rail Safety Regulators' Panel

When to apply the CFF

- **Level 1/ Level 2** Investigations (AS 4292.7)
- Other events
  - eg near misses
  - Other occurrences that operators choose to code

Rail Safety Regulators' Panel

Part 2

What is it - Setting the Context

Looking beyond the framework

What does the CFF consist of

How to Apply

Rail Safety Regulators' Panel

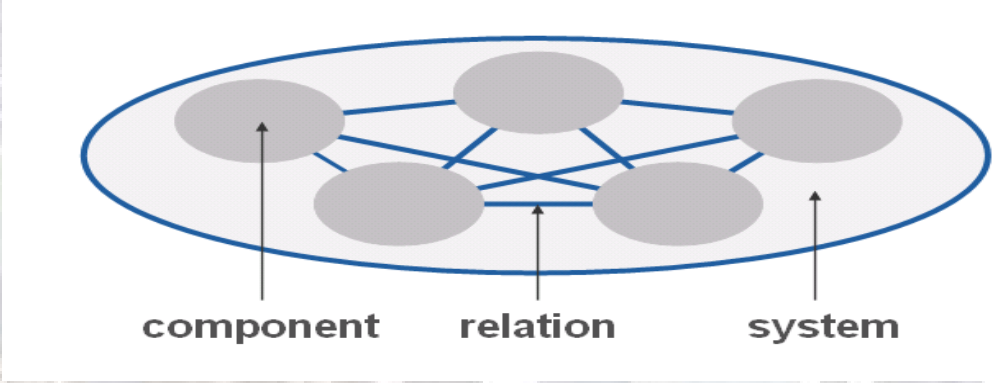
Design Goal

- Accommodate use by organisations with limited resources
- Compatible (as far as possible) with existing standards, frameworks / databases & ARA Code of Practice.
- Design for sustainability over time
- Easily understood & used by ‘lay’ personnel (users language, good definitions)
- Easy to find and follow codes
- Encourage accurate recording
- Framework links to the occurrence details
- Framework permits both coded and free text descriptions
- Importance and/or frequency of factors as culling device for codes
- Minimise duplication to maintain data reliability
- Multi – modal (for different transport modes)
- Provide sufficient level of detail to allow comprehension & effective analysis
- Time efficient

Rail Safety Regulators' Panel

“Systems Approach”

- “Set of components that are inter-related”.



- Number of factors from different parts of the organisation combined, leading to the accident (system failure).

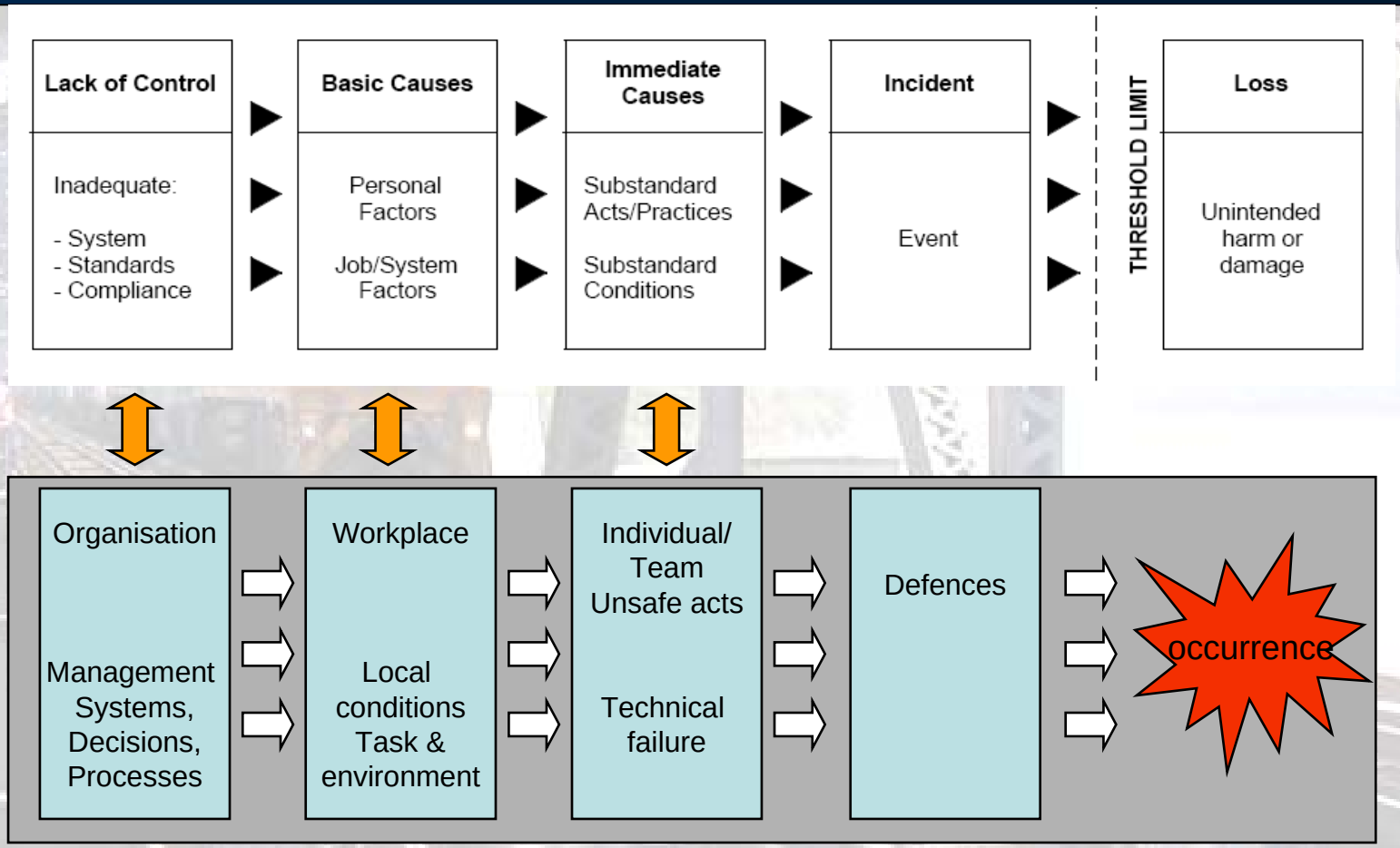
Rail Safety Regulators' Panel

System Investigations

- Assumptions:
  - Human error is inevitable and must me “catered for”
  - Error is a consequence
- Consider the whole organisation
  - Not just “what happened”!
  - See the event as a symptom
- Look upstream
  - Past decisions by management
  - Worker competence and support systems
  - Supervision, resourcing
- Identify the conditions that led to the event.

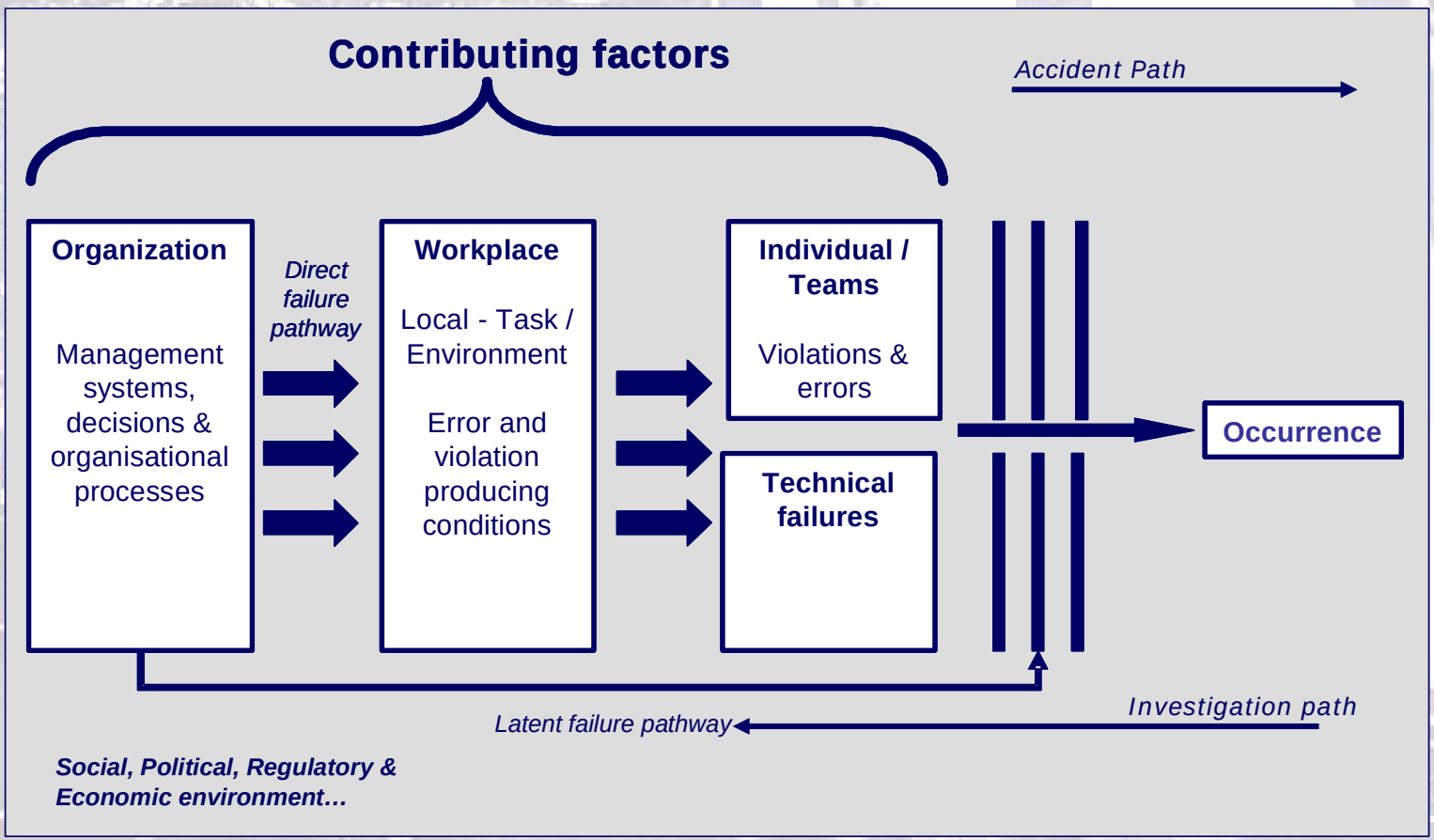
Rail Safety Regulators' Panel

System Models



Rail Safety Regulators' Panel

Model of Organisation Accidents



- The CFF is based on the “Reason model”

Rail Safety Regulators' Panel

Part 3

What is it - Setting the Context

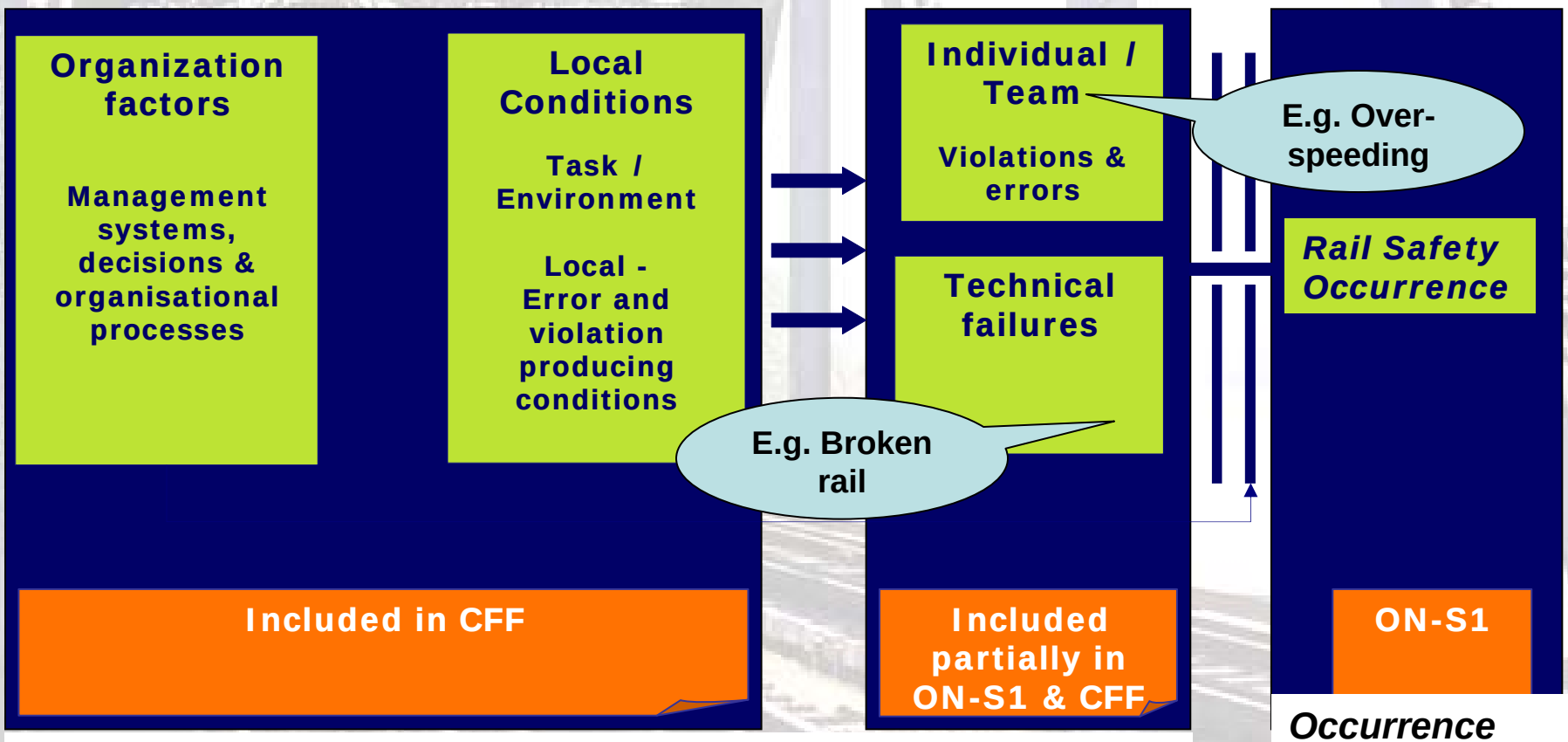
Looking beyond the framework

What does the CFF consist of

How to Apply

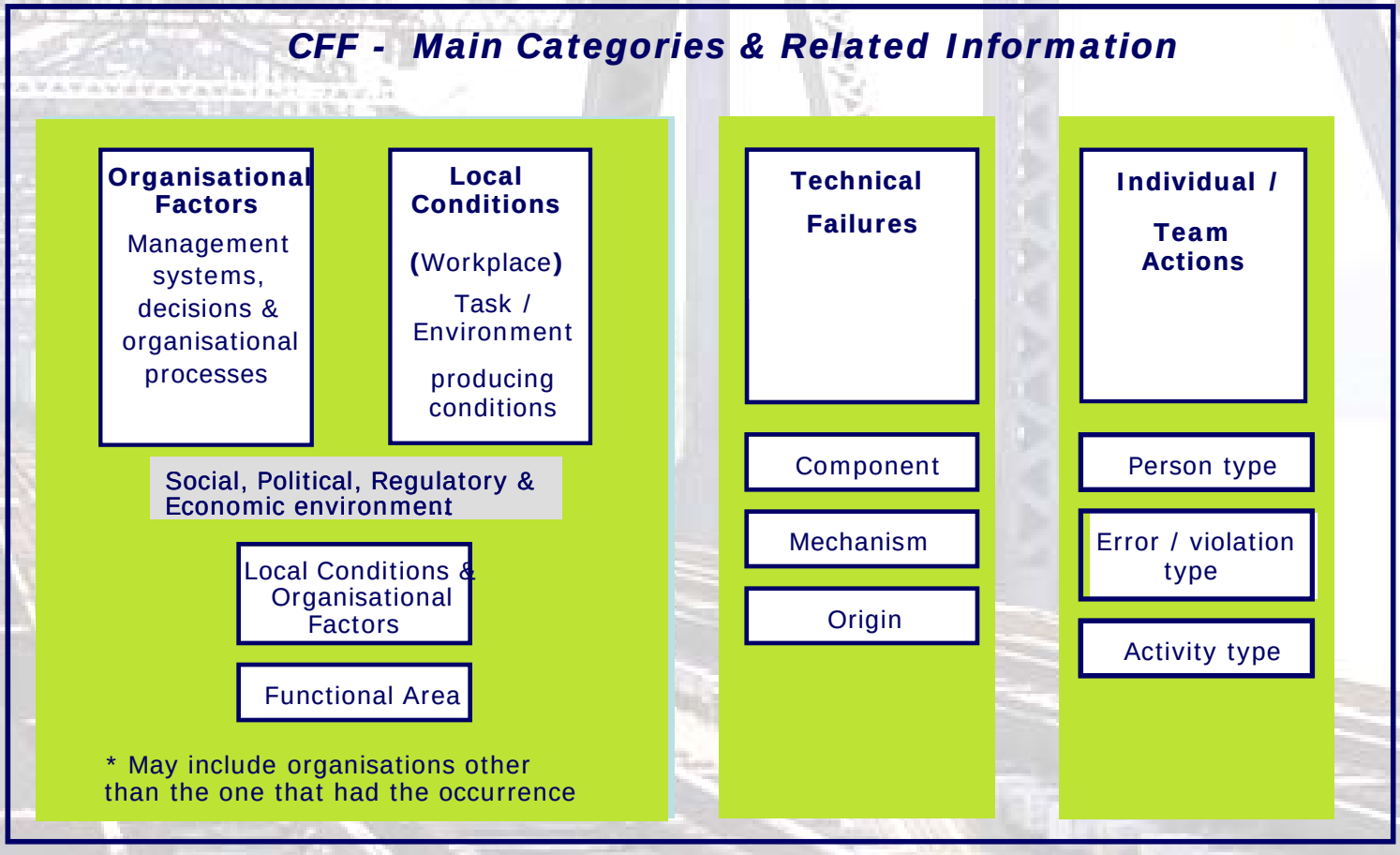
Rail Safety Regulators' Panel

CFF Components



Rail Safety Regulators' Panel

CFF Data Types



Rail Safety Regulators' Panel

CFF Manual

- ✓ Glossary of terms
- ✓ Context of CFF
- ✓ The structure of the CFF
  - ✓ Components & sub-elements
- ✓ How to guide
- ✓ Definitions of factors and keywords
- ✓ Summary tables
- ✓ Coding sheet
- ✓ Case studies

Rail Safety Regulators' Panel

Part 4

What is it - Setting the Context

Looking beyond the framework

What does the CFF consist of

How to Apply

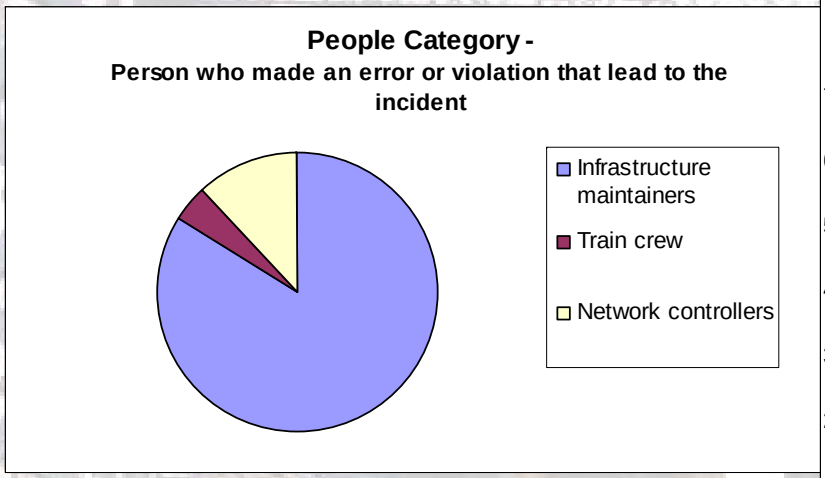
Rail Safety Regulators' Panel

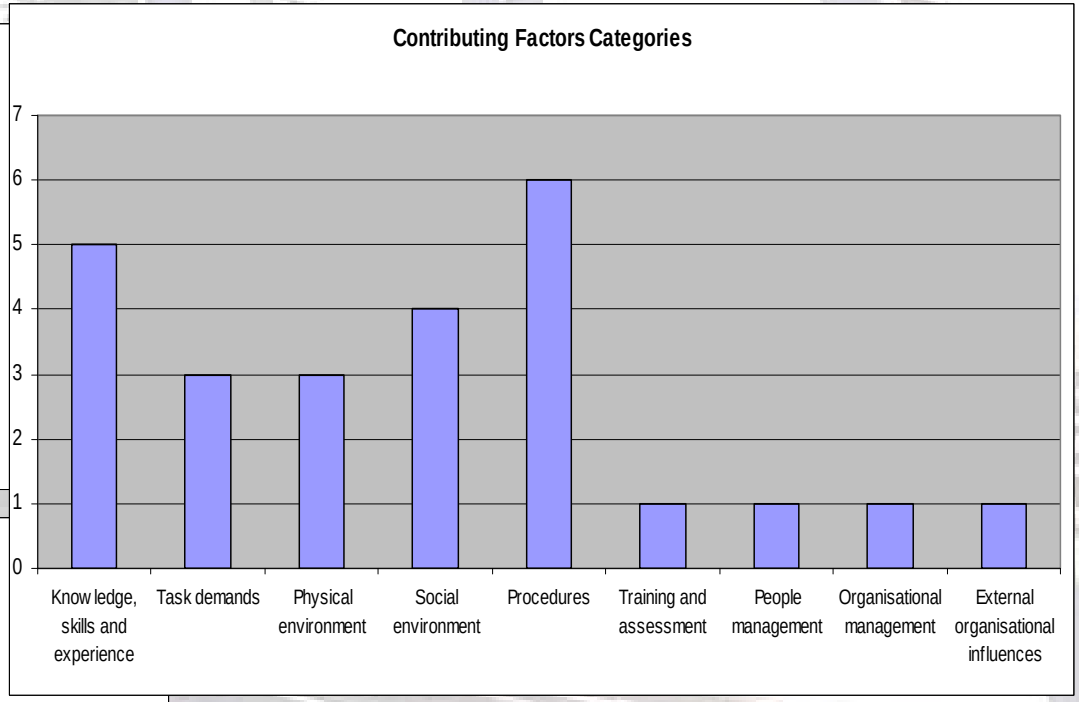
How to apply the CFF?

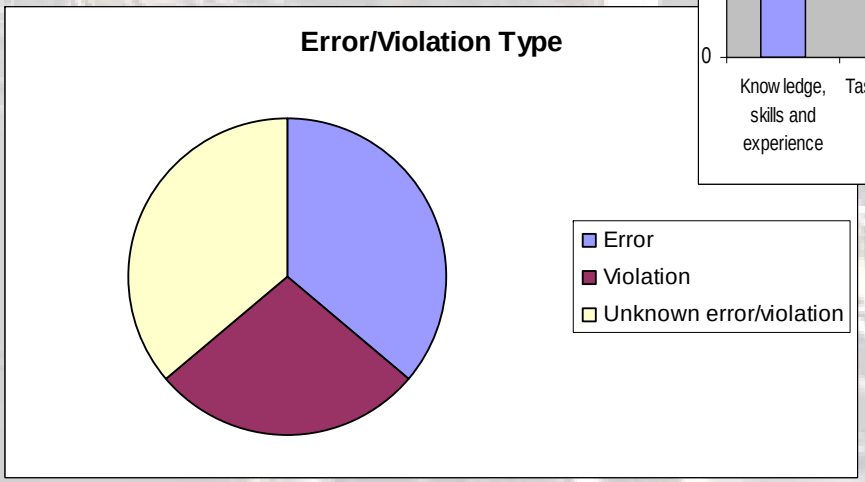
- Applied by regulators / investigators / operators using the CFF data set and coding sheets
- Applied after the occurrence “findings” have been determined
- Person who has investigated the occurrence best placed to code findings

Rail Safety Regulators' Panel

Analysis of Contributing Factors







Rail Safety Regulators' Panel

Data Management

- RSRP – ownership
- NROD – management
- CFF group - review data quality
- State regulators to manage and report on data
- Information stored on state-level and pooled nationally at intervals

Rail Safety Regulators' Panel

What's in it for you?

- Provide operators with a (free) validated and tested framework, user manual and software
- Enables operators to compare contributing factors across the industry
- Enables the identification and analysis of safety trends and conditions affecting them
- Provides a more informed understanding of the systemic issues associated with different rail safety occurrences

Rail Safety Regulators' Panel

Rail Safety Regulators' Panel

Thank you!