

# SUCCESS FACTORS: Building a bright future for human factors in Australian Rail

Alison Gembarovski and Jen Alcock

28 November 2023



**SUCCESS FACTORS:**  
**Building a bright future for**  
**human factors in Australian Rail**



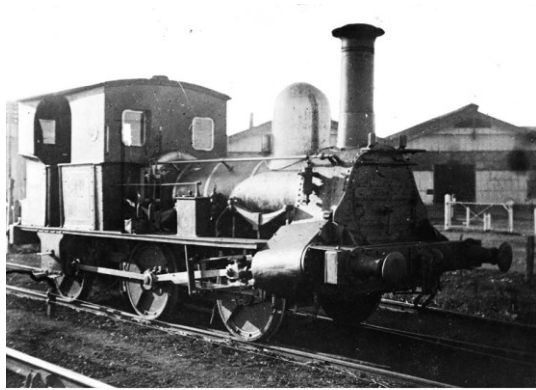
Rail human factors  
- the future

Rail human factors  
- the past



1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030

**1850s**  
Pioneer  
railways in  
Australia



**1901**  
Federation and  
agreement to  
interstate  
network

**1910**  
Railway  
Commissioners  
conference  
chose  
4ft 8½in  
standard gauge

**1960s to 1995**  
Interstate network  
conversion to standard gauge

1850s

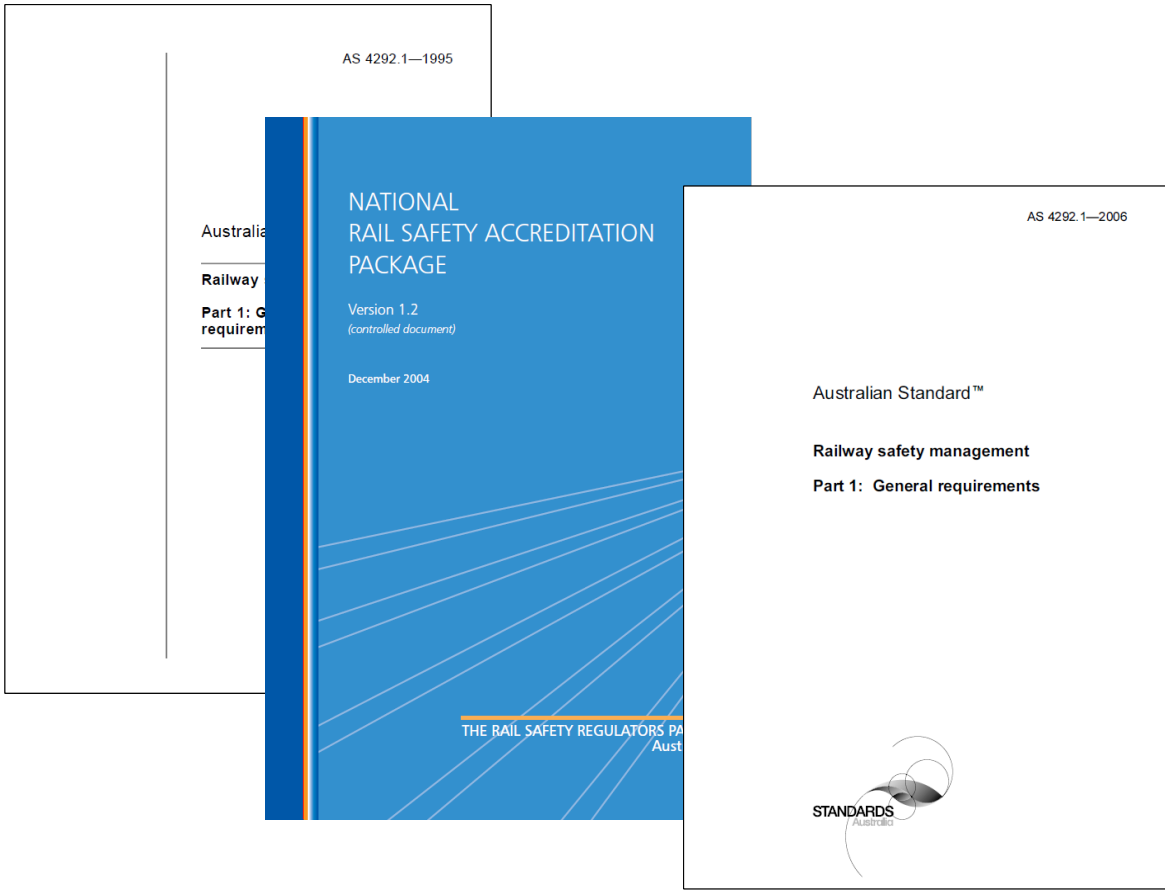
1900

1910

1960

1995

2023

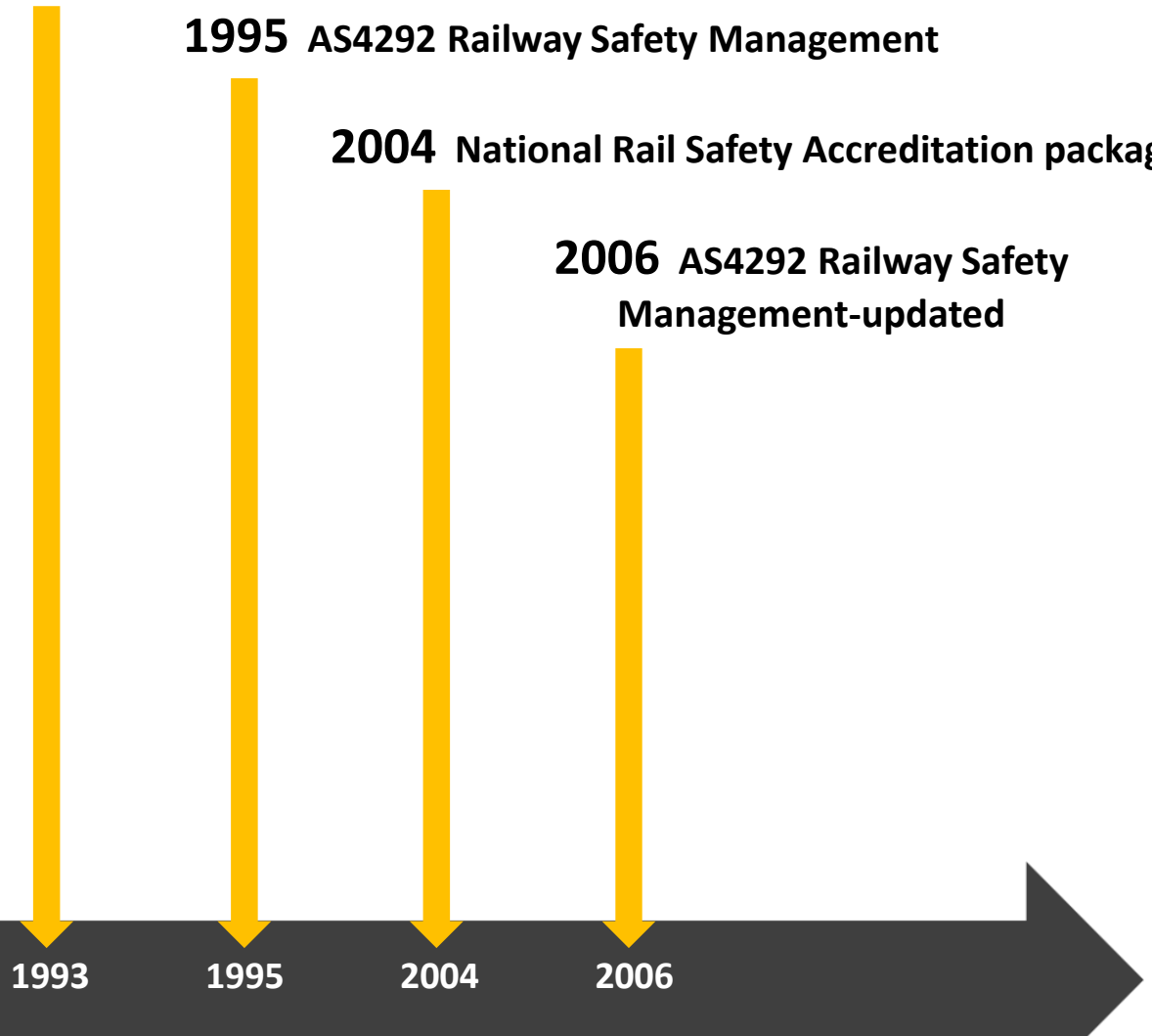


**1993** Early regulatory reform

**1995** AS4292 Railway Safety Management

**2004** National Rail Safety Accreditation package

**2006** AS4292 Railway Safety Management-updated

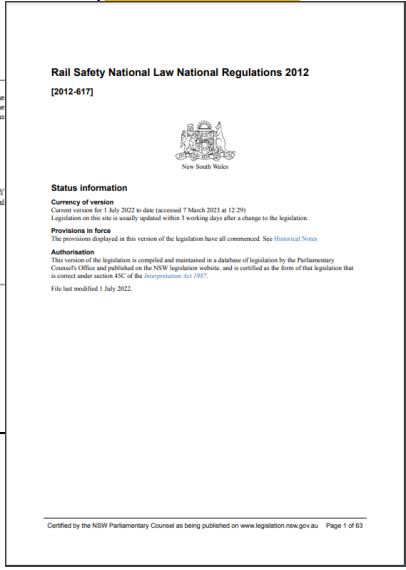


1993

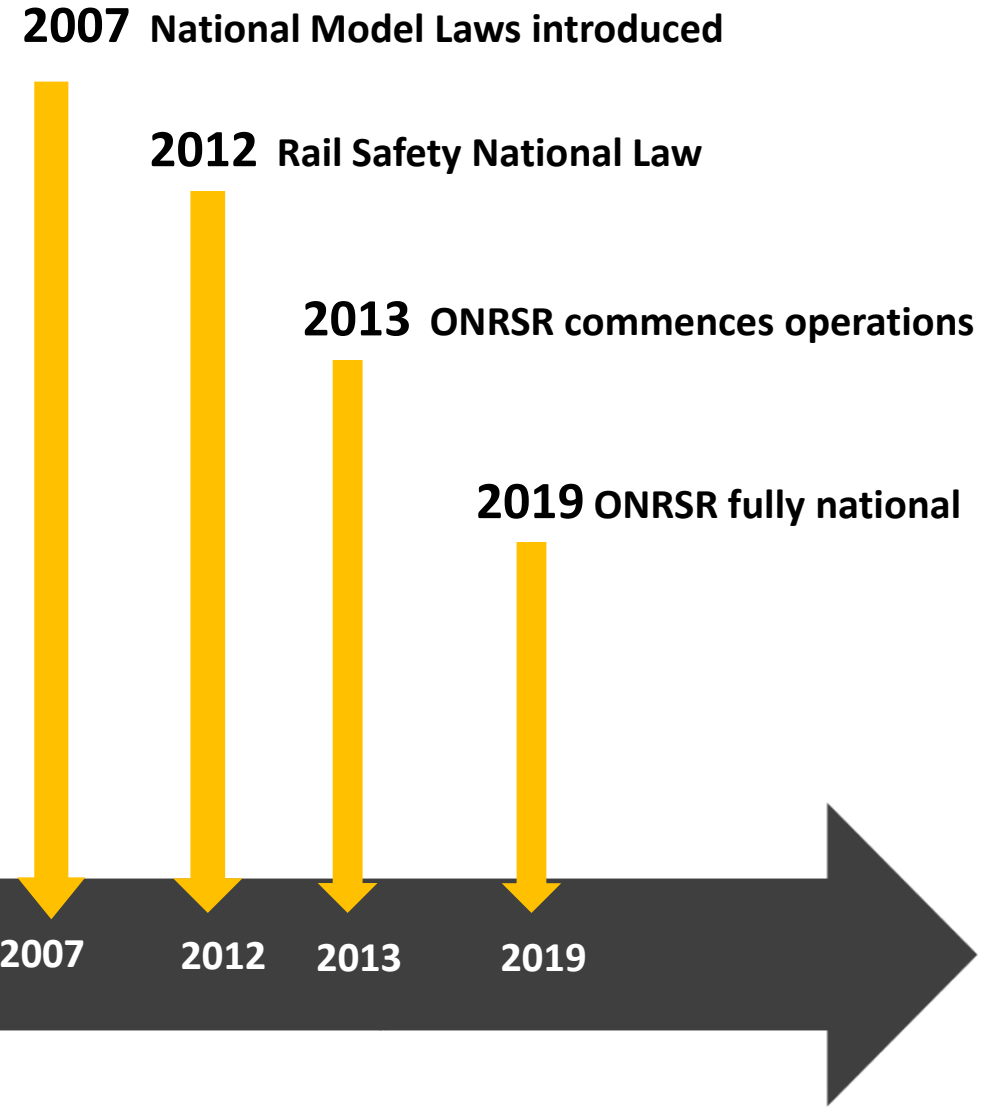
1995

2004

2006



*Procedures to ensure that **human factor matters are taken into account during development, operation and maintenance of the SMS** and integration of human factors principles and knowledge into all relevant aspects of operational and business systems*



*“Developments in safety management overseas point to the **importance of human factors, organisational and managerial issues***

*and the development and maintenance of a **strong safety culture** as being matters of **fundamental importance to the proper management of safety** in any large organisation.”*

Special Commission of Inquiry Into the  
**Glenbrook Rail Accident** – Final Report April  
2001 – Justice McInerney



Special Commission of Inquiry Into the  
**Glenbrook Rail Accident**

Final Report

April 2001

The Honourable Peter Aloysius McInerney

2001

“The process of risk analysis requires at the outset that there must be an ***understanding of the particular features of the whole system*** and the activities that are to be managed.

This requires appreciation of ***what makes the system work***, in terms of the ***human factors, equipment, infrastructure and relationships between them***”

“.....whatever the documentation claims, ***the reality was different***”

*Special Commission of Inquiry Into the Waterfall Rail Accident – Final Report 2005*



Special Commission of Inquiry into the  
Waterfall Rail Accident

Final Report  
Volume 1  
January 2005

The Honourable Peter Aloysius McInerney



Special Commission of Inquiry into the  
Waterfall Rail Accident

Final Report  
Volume 2  
January 2005

The Honourable Peter Aloysius McInerney QC



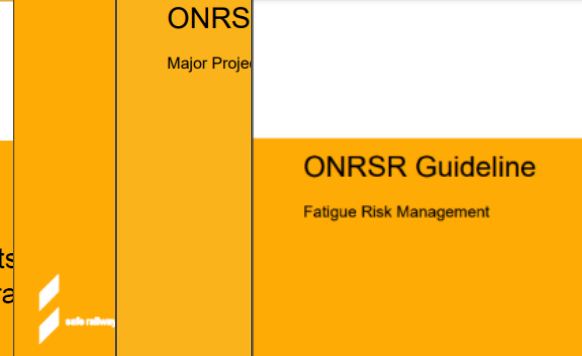
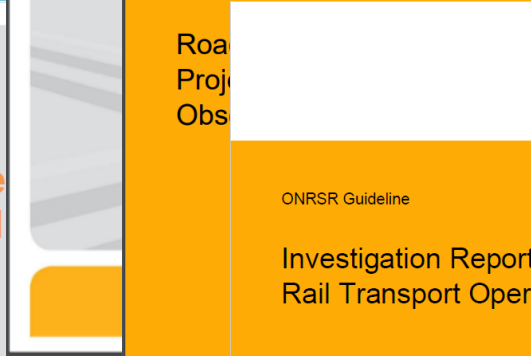
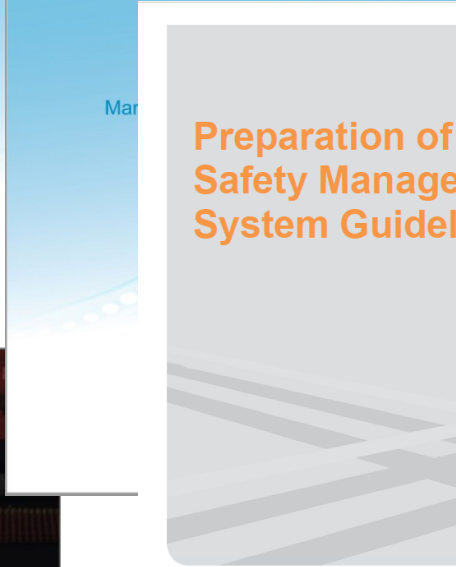
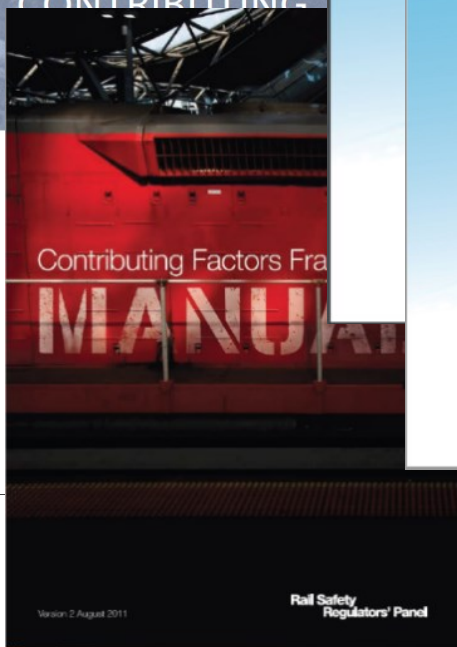
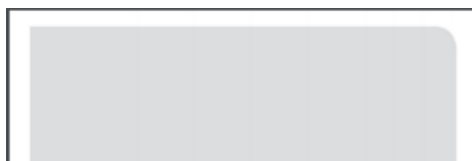
2003



**2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023**



A decade of ONRSR



2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023



**Culture Hub Survey**

Survey Manager Access

The Culture Hub Survey enables organisations to conduct a self-assessment of their safety culture and identify opportunities for safety culture improvement.

Survey Manager Access

- Not
- Factors
- In, the

Version 2.0 | 10 June 2014

**Rail Safety Investigation**

RISSB

**Guideline**

**Integration of Human Factors in engineering design**

RISSB

Version 5.2 | 29 November 2012

**Fatigue Risk Management**

RISSB

AS 7631:2015

**Australian STANDARD**

**Railway Infrastructure - Sighting**

**Safety Critical Communications**

RISSB

AS 7533:2021

**Australian STANDARD**

**Driving cabs**

**GUIDELINE**

**SPAD Risk Management**

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AS 7631:2015

**Australian STANDARD**

**Human Factors Integration Engineering Design - General Requirements**

**RISSB**

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**Guideline**

**Integration of Human Factors Across the Project Lifecycle**

**Guideline**

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**Achieving a positive safety culture in the rail corridor**

**Guideline**

risb.com.au

## Simulated train driving: Fatigue, self-awareness and cognitive disengagement

Jillian Dorrian\*, Gregory D. Roach, Adam Fletcher, Drew Dawson

Understanding the human factors contribution to railway accidents and incidents in Australia

Melissa T. Baysari\*, Andrew S. McIntosh, John R. Wilson

## Driver fatigue during extended rail operations

Sarah M. Jay\*, Drew Dawson, Sally A. Ferguson, Nicole Lamond

*The Centre for Sleep Research, University of South Australia, City East Campus, Level 7, Playford Building, Frome Road, Adelaide 5000, South Australia*

## New control room technologies: human factors analytical tools for railway safety

Elise GC Crawford<sup>1</sup>, Yvonne Toft<sup>1</sup> and Ryan L Kift<sup>1</sup>

## Keeping rail on track: preliminary findings on safety culture in Australian rail

Verna Blewett<sup>a,\*</sup>, Sophia Rainbird<sup>a</sup>, Jill Dorrian<sup>b</sup>, Jessica Paterson<sup>a</sup> and Marcus Cattani

Proc IMechE Part F:  
J Rail and Rapid Transit  
227(5) 529–538  
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DOI: 10.1177/0954409713501656  
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## Learning from Accidents: Developing a Contributing Factors Framework (CFF) for the rail industry

Elizabeth Grey<sup>1</sup>, Barbara Klampfer<sup>2</sup>, Gemma Read<sup>1</sup> and Nic Doncaster<sup>3</sup>

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

## Complexity on the rails: A systems-based approach to understanding safety management in rail transport

G.J.M. Read<sup>a,\*</sup>, A. Naweed<sup>b</sup>, P.M. Salmon<sup>a</sup>

<sup>a</sup> Centre for Human Factors and Sociotechnical Systems, University of the Sunshine Coast, Maroochydore, Queensland, Australia

<sup>b</sup> Appleton Institute for Behavioural Science, Central Queensland University, Weyville, South Australia, Australia

On good form? Analysis of rail Signal Passed at Danger pro formas and the extent to which they capture systems influences following incidents


Anjum Naweed<sup>a,\*</sup>, Lorelle Bowditch<sup>a</sup>, Janine Chapman<sup>b</sup>, Jillian Dorrian<sup>c</sup>, Nora Balfe<sup>d</sup>

The danger in the dark: Safety and teamwork in Australian dark territory railway operations

Colin Scott MacGregor, Master of Rail Safety Management, Chris Bearman, Ph.D.<sup>\*</sup>

Central Queensland University, Appleton Institute, Australia

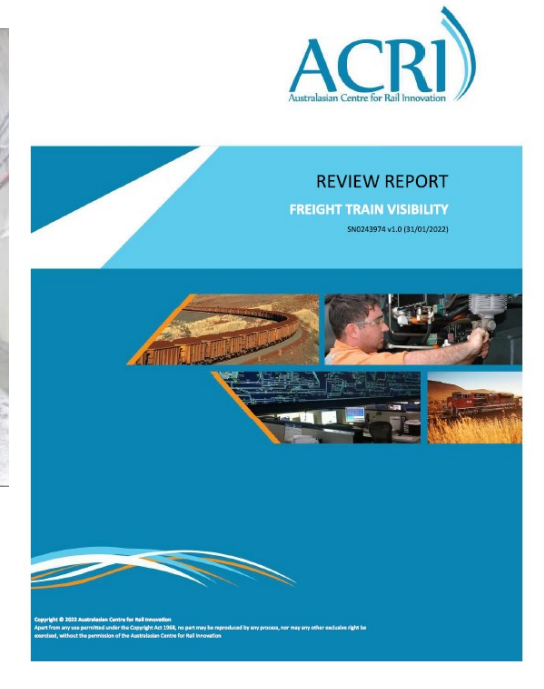
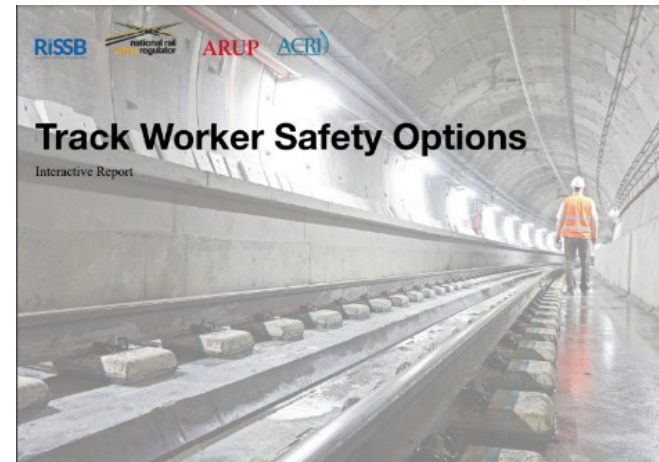
Caught between a rail and a hard place: a two-country meta-analysis of factors that impact Track Worker safety in Lookout-related rail incidents

Anjum Naweed<sup>a</sup> , Mark S. Young<sup>b,c</sup> and Jeanette Aitken<sup>d</sup>



Development of the contributing factors Framework interview guide (CFF-IG): All aboard the rail safety truth train

Dennis Duncan, Karen Klockner<sup>\*</sup>

Central Queensland University, 160 Ann Street, Brisbane, Queensland, Australia



King of the castle: organisational influences on authority gradients between network controllers and other team members

Bridie Luva  and Anjum Naweed 

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

## **SUCCESS FACTORS: Building a bright future for human factors in Australian Rail**

- Recognition of HFE in rail
- Growing body of HFE professionals
- Collaboration and consultation
- Advocacy of HFE in rail
- Research and guidance material
- Forums, webinars and conferences



Rail human factors  
- the future

Rail human factors  
- the past

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# SAFE RAILWAYS FOR AUSTRALIA

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