RISSB Product Proposal (and Prioritisation)

Primary information	
Type of product being suggested:	Code of practice
Title of product being suggested:	Train Control Systems Application Design Code of Practice Signalling Plans Module
Date of suggestion:	18/2/2019
Reason for suggestion:	It is proposed that a code of practice (i.e. a deemed-to-comply prescriptive way of achieving the performance-based requirements in standards) is developed for the application design of train control systems (noting that 'train control systems' is the RISSB term that is inclusive of signalling, communications and train control). It is proposed that this code of practice consists of several modules. Generally, the modules would be aligned with how tasks are allocated to people. For instance, a designer may be given the task 'design the signalling plan' (note that 'signalling plan' is also known as 'scheme plan', 'signalling arrangement plan', etc.). Therefore, it is proposed that there is a signalling plans module that contains (or references) all of the information that a designer needs to know in order to design a non-novel signalling plan. The modules aligned with how tasks are allocated to people could include: • Application design inputs • Correlation • Asset condition surveys • Signalling plans • Signal sighting • Control tables • Interlocking logic • Cable running plans • Bonding plans • System architecture • Power calculations • Power distribution plans • Level crossing layout plans • Circuit diagrams • Operating notice diagrams • Material lists • Assets registers Several of these modules could each form the basis of a **national unit of competency**, with an associated **national training course**. **As registration of engineers progressively becomes a requirement Australia-wide, these modules form (in the words of the legislation) the 'prescriptive standards' that allow persons who aren't registered professional engineers to be able to undertake these tasks without requiring the direct supervision of a registered professional engineer.**

	There would also be modules that are applicable to multiple tasks and are referenced by the above modules, such as: • Document control for document controllers • Document control for designers • Symbols • Presentation • Verification process • Risk assessment **This proposal relates to the Signalling Plans module.** Whilst standards provide performance-based requirements (where there, rightly, should be many ways of achieving those requirements), **this code of practice module provides THE way to design signalling plans in Australasia for non-novel situations**. As noted in the *ARA Skills Capability Study – Skills Crisis: A Call to Action*: *As discussed heavily in industry soundings, differences in standards and systems historically developed by the different jurisdictions in Australia and New Zealand have had the following impact on skills development and hence workforce capability:* • *The different systems and skillsets required means that rail workers need to either learn more than is strictly necessary to operate in their jurisdiction to meet national competency guidelines, or not learn enough to be able to move readily between jurisdictions to meet localised skills shortages. Consequently, when making moves in careers or locations, rail workers are more likely to opt for similar positions in other industries rather than staying within the rail industry than if a single national standard was used.* • *Secondly, by effectively breaking up the Australasian market into much smaller jurisdictional markets, differences in standards and systems do not provide economies of scale in manufacturing, operations and maintenance, reducing benefits from economies of scale. It also impacts on economies of scale in the training of skills, affecting the commercial viability of training itself.* • *Training, skills development and assessment can be very different by jurisdiction, presenting challenges to the effective utilisation of the Australasian pool of trainers through both public and private sector registered training organisations (RTOs), as well as developing national frameworks for the delivery of training around new technologies.* *For the rail industry, this deficiency in uniform standards and systems ultimately presents a market failure in terms of the high barriers to transferring skills – either geographically within Australia or between Australia and New Zealand, or when trying to bring skills in from other industries (or overseas). In many discussions, the different jurisdictions were compared to as different countries, not different states, given their unique systems,*

	regulations and definitions. This common refrain is reflected in the following statements made during the deep dive interviews: *"As an industry we don't encourage transferability across state borders. There are different systems, different standards that you need to learn."* *"There is a genuine shortage of the engineering skills in areas we want it. But we've made it worse by putting barriers to entry."* *"We need to work towards interjurisdictional hybridisation in the rail tech, harmonisation and transparency with other sectors… There are so many common skills, but we create many barriers to entry."* The signalling plan is particularly critical, as it is the "top of the tree" signalling design. Any rework to the signalling plan as a project progresses results in rework to the lower level designs (e.g. bonding plans, cable running plans, circuit diagrams and so on).
Railway discipline area:	Train control systems

Objective:

The objective of the Signalling Plans module within the Train Control Systems Application Design Code of Practice is to provide signalling design engineers with a deemed-to-comply prescriptive way of achieving the performance-based requirements in RISSB standards for the design of non-novel signalling plans.

Scope:

The scope of the Signalling Plans module within the Train Control Systems Application Design Code of Practice is the design of non-novel signalling plans (note that 'signalling plan' is also known as 'scheme plan', 'signalling arrangement plan', etc.) and the supporting time-distance graphs and aspect sequence charts.

It fulfils the definition of a 'prescriptive standard' in registration of engineers' legislation. Therefore, it allows persons who aren't registered professional engineers to be able to design and check signalling plans without requiring the direct supervision of a registered professional engineer.

Hazard identification:

1	Rail traffic collides with other rolling stock	6	
2	Rail traffic derails	7	
3	Rail traffic collides with road users or vehicles at railway crossings	8	
4	Rail traffic is incompatible with the infrastructure	9	
5	Rail traffic collides with rail safety workers or equipment in the rail corridor	10	

Definitions

i A ***Guideline*** is a set of informative guidance. It is not normative but informative.

A ***Code of Practice*** is a set of descriptions. It is the "how" one can meet a higher-level requirement (either of a Standard, or a piece of Legislation). It is normative, but by its nature can contain several options about how to achieve compliance with the higher-level requirement. It can also have some informative guidance within it if it is more practical than writing a separate guideline.

A ***Standard*** is a set of requirements only. It is the "what" must be done to be claim compliance to the standard. It is normative. It can also contain optional and/or supplementary requirements, but they still should be worded as requirements.

Benefits:

Safety

This code of practice would incorporate best practice from across the Australasian rail industry, which would improve the actual system safety.

A consistent Australasian approach to the design of signalling plans allows:

- Quantity of scale that would support a national training course for signalling plans, which results in greater actual competence of the signalling design engineers performing the work.
- A national unit of competence for signalling plans which justifies a more thorough assessment of competence (rather than each RIM having its own variable assessment of competence), which results in greater actual competence of the signalling design engineers performing the work.
- As most signalling design engineers perform work for multiple RIMs, the signalling design engineers will have a greater proficiency with one Australasian standard, rather than lesser proficiency with each of multiple RIM standards.

Interoperability / harmonisation

This code of practice module provides THE way to design signalling plans in Australasia for non-novel situations.

Financial

This code of practice would incorporate best practice from across the Australasian rail industry, which would include ways to reduce the cost of the signalling system.

A consistent Australasian approach to the design of signalling plans allows:

- Quantity of scale that would support a national training course for signalling plans which results in signalling design engineers being trained once, rather than having to be trained (formally or informally) on multiple RIM standards.
- A national unit of competence for signalling plans which results in signalling design engineers being assessed once, rather than having to be assessed by each RIM.
- As most signalling design engineers perform work for multiple RIMs, the signalling design engineers will have a greater proficiency with one Australasian standard, rather than lesser proficiency with each of multiple RIM standards. This results in greater efficiency and productivity, and less rework.

As this code of practice module would fulfil the definition of a 'prescriptive standard' in registration of engineers' legislation, it allows persons who aren't registered professional engineers to be able to design and check signalling plans without requiring the direct supervision of a registered professional engineer.

Environmental

Not applicable.

Impacts:

RIMs will, generally, require some 'encouragement' to let go of 'how we have always done it'.

Reference / source materials:

#	Reference / source material	Available from
1	None known.	
2		
3		
4		
5		

Definitions

ii ***Interoperability*** is the ability of a process, system or a product to work with other process, systems or products (aka compatible systems through managed interfaces).
iii ***Harmonisation*** - the act of bringing into agreement so as to work effectively together (aka uniformity of systems).