RISSB Product Proposal (and Prioritisation)

RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD
ABN: 58 105 001 465

Primary information	
Type of product being suggested:	*Standard*
Title of product being suggested:	*Train braking rates*
Date of suggestion:	*Mar 2019*
Reason for suggestion:	*Railways are fitting various ATP/ETCS/CBTC technologies their trains. The signalling design and implementation of these systems is dependent on the braking performance of the train. An appropriate standardised method for determining this braking rate is required to ensure consistency and to allow the best optimisation to ensure best use of the technology*
Railway discipline area:	*Train control (interfaces with rolling stock)*

Objective:

Critical within the safe separation of trains, is an understanding of their braking performance. Braking is affected by many variables from weight/loadings, environmental conditions, wear, etc. This Standard will provide a common methodology for calculating braking rates for use in designing ATP/ETCS/CBTC as well ac designing conventional signalling systems, and for specifying new trains and/or refurbishing existing fleets.

Scope:

The Standard:

- *Will look at developing a common method for calculating, field testing and determining the braking rates of trains under ideal and non-ideal conditions;*
- *Will document requirements for managing slip-slide events for fixed-block and moving-block signalling systems, to ensure safe separation of trains and safe arrivals at terminating stations;*
- *Will identify the need for harmonious braking rates, so that future purchases of trains can be interoperable with infrastructure already equipped with ATP (or similar) technology, by ensuring new rolling stock has appropriate braking performance;*
- *May document current practice or braking performance of current train fleet. This could be beneficial to other railways who may be more or less conservative in their signalling systems design based on their braking performance of trains;*
- *May cover braking enhancement systems, adhesions enhancement systems*
- *Will provide alternative treatments where braking performance is poor or below standard due to adhesion conditions, to allow ATP technologies to integrate with train braking systems.*

Hazard identification: *(what safety hazards would the proposed product seek to address)*

1	*Derailment and or Collision*	6	
2	*Damage to Rolling Stock and or Infrastructure*	7	
3	*Third Party Property Damage*	8	
4	*Injury or Death of an Employee*	9	
5	*Injury or Death of a third Party*	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: *(enter wherever applicable in below categories)*

Safety

Understanding braking performance is fundamental to maintaining safe separation of trains. It factors into the design of our signalling systems, the design of our infrastructure, the programming of our service patterns, etc. A deeper understanding that is applicable across Australia will raise the bar for safer train operations.

Interoperability / harmonisation

A more scientific approach to braking rates will pave the way for future signalling systems that will support improved interoperability (e.g. in-cab signalling / moving block).

Financial

Better approaches to management of braking rates will ensure safe separation of trains and therefore reduce the opportunity for train accidents. It could also create opportunities to take greater advantage of latent capacity within networks e.g. if it's discovered that headways can be safely reduced, thus releasing that capacity without expensive infrastructure works.

Environmental

Better performing rail systems reduce the opportunity for failings that might have environmental impacts.

Impacts:

Different railways will have documented processes (at different levels of maturity) for calculating braking rates. The difficulty will be in bringing all those together in a way that is acceptable to them all.

Reference / source materials: *(This is very important; it will directly impact the tone/style/flavour of the product. It will also have an impact on the research we undertake and therefore impact timescales/cost. It may also be useful to identify reference / source materials that should be avoided.)*

#	Reference / source material	Available from
1	https://www.era.europa.eu/sites/default/files/activities/docs/introduction_to_etcs_braking_curves_en.doc	
2	https://documentportal.metrotrains.com.au/engineeringdocs/Forms/L4-CHE-FOR-098.xls	
3	https://www.transport.nsw.gov.au/system/files/media/asa_standards/2018/t-hr-sc-10003-st.pdf	
4	EN 13452-1 Braking - Mass Transit Brake Systems	
5	EN14531-1 Methods for calculation of braking distances	

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).