RISSB Product Proposal (and Prioritisation)

Primary information	
Type of product being suggested:	Guideline
Title of product being suggested:	Reliability, Availability and Maintainability (RAM) Guideline for the Australian Rail Industry
Date of suggestion:	14 Feb 19
Reason for suggestion:	The Australian rail industry lacks a dedicated standard for Reliability, Availability and Maintainability (RAM) and relies on the use of the European CENELEC/IEC standards suite. This includes EN 50126 standards, which address the combined topic of Reliability, Availability, Maintainability and Safety (ie RAM + S). Alternatively, in Europe, Australia and internationally there are also a mix of more generic standards relevant to separately Reliability (R), Availability (A) and Maintainability (M) in a general environment.
	The issues for the Australian context include:
	• Which standards must or should be used for RAM in the Australian railway context?
	• Which parts of standards must or should be used for RAM (vice RAMS)?
	• How should the standards be used?
	• What other standards are applicable, relevant or informative?
	• How can a suitable and customised RAM program be developed, managed and delivered?
Railway discipline area:	Reliability, Availability and Maintainability (RAM)
	Applicable to infrastructure, rolling stock, and train control.

Objective:
Develop and publish a guide that informs the transport industry, from requirements authorities, through developers and manufacturers, to operators and maintainers on the selection and use of appropriate Reliability, Availability and Maintainability (RAM) standards in the Australian rail transport context.

Scope:
Various issues to be addressed include:

- EN 50126-1:2017 is a European-developed standard for RAMS in railway applications. What are the relevant standards for use in Australia? What is mandatory, what is optional, what is good practice, what should be avoided, etc.
- EN 50126-1:2017 addresses the aggregated topic/area of RAM + Safety (S) in a railway context, but System Safety is often disaggregated from RAM in requirements and

acquisition programs and dealt with in a different/discrete manner within a greater safety framework.

- o How should RAM be addressed when the Safety program is extracted from the coverage assumed in EN 50126-1:2017 and handled differently?
- o How should the RAM and Safety programs work together?
- Other generic RAM standards (ie not railway specific) are available internationally and in Australia. [eg Australian Standards, IEC standards, MIL-STDs, IEEE standards, commercial standards, IEC Dependability Standards, etc.] Which standards (and which parts of standards) should be applied for the railway context in Australia?
- SR CLC/TR 50126-3:2008 provides a guide to the application of EN 50126-1 to Rolling Stock RAM. A guide (such as an 50126-4) applicable to infrastructure is needed that addresses the RAM aspects applicable to:
  - o Signalling,
  - o Track,
  - o Power,
  - o Operational Controls Systems (OCS) and
  - o Building & Structures.
- Which standards provide recommended or best practice for RAM in the Australian railway context?
- How can a suitable and customised RAM program be developed, managed and delivered?

	Hazard identification:			
1	N/A	6	
2		7	
3		8	
4		9	
5		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

The RAM Program and the System Safety Program are very closely related. The clarification of how the programs would work together means each program can be more effective and efficient.

Interoperability / harmonisation

The guideline would provide clarification of the relevant standards and best practices for RAM in the Australian railway context. State-based projects could be harmonised.

Financial

Common RAM standards and the adoption of common frameworks, classifications and processes would lead to better requirements development and project delivery.

Clarification of requirements and the removal of unnecessary complication/activities would increase efficiency of development programs.

Environmental

Not applicable.

Impacts:

Will require significant effort to engage stakeholders, including state transport authorities, transport operators and suppliers of rail assets.

Will require significant specialist input including reliability/RAM professionals.

Reference / source materials:		
#	Reference / source material	Available from
1	EN 50126-1:2017 Railway Applications – the Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) – Part 1: Generic RAMS Process	https://infostore.saiglobal.com/en-au/
2	EN 50126-2:2017 Railway Applications – the Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) – Part 2: Systems Approach to Safety	https://infostore.saiglobal.com/en-au/
3	SR CLC/TR 50126-3:2008 Railway applications – The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS) – Part 3: Guide to the application of EN 50126-1 to rolling stock RAM	https://infostore.saiglobal.com/en-au/

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).