AN COIMISIÚN UM RIALÁIL IARNRÓID
COMMISSION FOR RAILWAY REGULATION

CRR-G-016-B

Guideline for the Safety Assessment of New Light Rail Rolling Stock

Guidance for CRR Inspectors, Railway Organisations and other Applicants for APIS

Issue	Prepared by	Reviewed by	Approved by	Date
B	Aidan Langley	Mary Molloy	Gerald Beesley	07.04.2016

1. Introduction

This Guideline must be read in conjunction with the CRR ***Guideline for Process of Authorisation for Placing in Service (APS) of Light Railway Subsystems (RSC-G-032)***.

It provides:
The List of Parameters to be considered as part of APS for Light Railway Rolling Stock. The Parameters relate to design, build, integration into a light rail system, operation and maintenance aspects.

Should there be any aspect of a specific project which is not integrating into the Parameters listed in the matrix, it is expected that the matrix (Annex 1) is amended accordingly by the Project.

For clarification: Within the context of the Railway Safety Act 2005, the definition of 'New' Rolling Stock includes new builds as well as existing rolling stock undergoing significant modification. Where modifications are proposed, CRR should be informed of the scope of such modifications for advice on whether they are deemed sufficiently significant as to require CRR authorisation or not.

For the purposes of these Guidelines, 'light rail' includes vehicles operating on tram or metro systems operating on underground or overground lines, which may include sections of on-street running in conjunction with road traffic/ pedestrians. It further includes non-passenger carrying vehicles such as OTMs.

2. Process of New Rolling Stock Acceptance (NRSA)

The general process of submission and review of the NRSA shall follow the approach outlined in the RSC ***Guideline for Process of Authorisation for Placing in Service (APS) of Light Railway Subsystems (RSC-G-032)***. A sufficient timeframe must be allocated within project programmes to allow for the submission and review cycle at each of the defined stages. Each cycle should include sufficient time for the development of robust submissions, for review by the CRR, and for any subsequent iterations of the submission through revisions and re-reviews prior to CRR-authorisation.

For each stage of the authorisation process the appropriate conformity evidence and assessment reporting must be prepared and submitted to the CRR.

At each stage of the authorisation process, and in order for the CRR to develop its judgement on the fitness for purpose and safe integration of the new rolling stock, the CRR reserves the right to review any or all of the supporting safety evidence and to participate in relevant verification and validation processes of aspects related to the NRSA process.

The CRR's normal intention, however, is to undertake a number of spot checks in order to gain sufficient confidence in the ability of the railway undertaking's safety management processes to assure the safety and fitness for purpose of new rolling stock.

Range and depth of these spot checks will generally depend on:

- engineering judgement,

- safety criticality of the individual aspects,
- availability of independent reporting, and
- findings of the initial spot checks.

3. Risk Acceptance Principles

The CRR expects the project to apply the risk acceptance principles as defined in EN50126/8/9 as good industry practice. CRR further considers, that the risk acceptance principles as defined in EU 402/2013 (including all amendments) may also be applied at light rail systems.

Risk Acceptance Principle 1: Risk mitigation by compliance with a code of practice
While employing this approach, care shall be taken to ensure that

- a suitable and integrated set of standards/ legal requirements is employed on the project,
- the equipment or process is being used as intended by the standards employed,
- the standards cover the project specific situation and integrate with the Irish railway environment (some standardised requirements might need justified adaptation in order to comply with this aspect),
- project related risks are covered in their entirety by the chosen standards,
- there are no obvious and reasonably practicable ways of reducing risk further.

Current Irish and European laws and regulations
The concept of code of practice cannot overrule any legal requirements as these are of mandatory nature.

Risk Acceptance Principle 2: Risk mitigation by replicating a reference system with suitable safety performance
In this case the reference system must have documented design and interfacing properties, which must be available for the project in order to replicate the reference system. The reference systems must (still) be approvable under current Irish and European law. The safety performance of the reference system must be documented and available.

Risk Acceptance Principle 3: Qualitative or Quantitative Risk assessment of the residual risk
Where this principle is used, the related risk acceptance criteria shall be proposed by the railway organisation for acceptance by the CRR within the staged acceptance process.

4. Testing, V&V

It is a fundamental safety management principle that, in order to validate any safety related design calculations, simulations and assumptions, V&V and type testing should be performed. Safety related type testing shall be performed under the scope of accreditation to ISO 17025. Safety related V&V shall be performed as defined in EN 50126/8/9. Any deviation from these principles shall be justified.

Routine testing must cover a suitable subset of the type testing scope in order to demonstrate that a series production item complies with the core parameters of the design.

All tests shall be of repeatable nature and be covered by retrievable test reports. A test report shall include (but is not limited to):

- identification of the tested item and description of its parameters,
- the method of testing,

- description of environmental parameters,
- all results of testing,
- any deviations from the test method,
- the determination of conformity made from these results,
- all information needed to understand and interpret the report.

All information shall be reported correctly, accurately, and clearly.

Type and routine testing should follow legislative requirements as well as current best industry practice where appropriate.

5. Independent Professional Review (IPR)

All safety management approaches contain the fundamental requirement that safety management activities must be reviewed by independent professionals who are not involved in the activities concerned.

These reviews may be structured as a series of safety audits and safety assessments. Audits provide evidence that the planned safety management approach have been followed and are effective. Assessments provide evidence that safety requirements are met.

Frequency, depth and level of independence of each type of review shall depend on the extent of the risk as well as novelty and complexity of the design.

As a general principle it is expected that the following aspects require independent professional review by a qualified professional, who is a member of an organisation independent from those organisations involved in the design decisions:

- running dynamics,
- structure,
- braking system,
- overall fire performance and concept of evacuation,
- train control,
- access and egress system.

The IPR shall be performed under the scope of accreditation to ISO 17020 Type A.

This principle is driven by the magnitude of potential consequences of the related risks and any exemptions to this principle require justification.

The work carried out by the independent professional shall be covered by a retrievable report. The report shall include all the results of examinations and the determination of conformity made from these results as well as all information needed to understand and interpret them. All this information shall be reported correctly, accurately, and clearly.

The full range of independent professional reviews may be carried out by a single organisation, or each individual review can be carried out by a different organisation. In each case, the requirement for independence of the reviewing organisation must be respected at all times.

6. Further Clarification

Further clarification on these Guidelines can be sought from the CRR.