AN COIMISIÚN UM RIALÁIL IARNRÓID
COMMISSION FOR RAILWAY REGULATION

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Guideline for the Development of an SMS for Light Rail

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Preface

Purpose

The purpose of this document is to provide guidance to Light Railway Organisations (LROs) in Ireland on requirements for obtaining Safety Certification from the Commission for Railway Regulation (CRR) based on assessment of their Safety Management System (SMS).

Scope

This document applies to the requirements for submitting documented evidence of a Light Railway Organisation's SMS to the CRR for conformity assessment as a pre-requisite to obtaining a Safety Management Certificate.

Responsibility

The CRR Principal Inspector - Conformity Assessment & Authorisations is responsible for the drafting, review and updating of this document.

This document will be updated on an as-required basis.

Revision History

Issue	Version	Section Number and Reason for Change
1.0	B	Updated references from RSC to CRR. Removal of out-of-date SMS requirement text and replaced with new Common Safety Methods SMS references / requirements (Section 5). Updated all ERA references, e.g., guidance on SMS.

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Acronyms used in the text

CRR	Commission for Railway Regulation
CSM	Common Safety Method
EN(s)	European Standard(s)
NIB(s)	National Investigation Body(ies)
NSA	National Safety Authority
RAIU	Railway Accident Investigation Unit (National Investigation Body)
RO	Railway Organisation (as defined in section 2 of the Railway Safety Act, as amended.) It includes LROs (Light Rail Organisation(s))
SMC	Safety Management Certificate
SMS	Safety Management System

1 Introduction

Railway Organisations, including Light Rail Operators/maintainers are required under section 39 of the Railway Safety Act 2005, as amended, to have and "implement a Safety Management System (SMS) and shall prepare a document describing the components of such safety management system."

A Railway Organisation (RO) in a light rail context means an organisation with responsibility in operating a metro, tram or other light railway system including the management, operation and safety of a light rail system; and this also includes the management and/or control of maintenance of the light rail infrastructure and rolling stock.

The SMS implemented by ROs must be assessed by the National Safety Authority, in this case the Commission for Railway Regulation (CRR), to ensure that it conforms to the requirements for obtaining a Safety Management Certificate (SMC).

ROs must therefore document their procedures and arrangements in a manner that allows:

- assessment prior to the delivery of the SMC,
- supervision after the granting of the SMC, and
- renewal of a SMC.

In accordance with s. 45(2) of the Railway Safety Act 2005, as amended, in advance of making a SMC application to the CRR, a LRO shall engage a suitably qualified person to independently assess its safety management system. The report of such person shall be submitted to the CRR at the same time as its SMC application.

This guidance document refers to obligations of ROs operating in a light railway context. This document is supplemented by the following:

Terminology and texts refer to good practice and other documents available in the railway sector, in other high reliability industries (civil aviation, maritime, chemical, nuclear, etc.) and in wide-spread management systems such as quality, environmental protection, etc.

This guidance document, which the CRR has prepared is based on the text of ERA guidelines relating to heavy rail. The CRR consider the ERA guideline as best practice and hence it is promoted to be adopted by LROs. The guideline is organised as follows:

In addition to this Section, further introductory information is provided in Sections 2 and 3 which outline the purpose and scope of an SMS together with the legal basis. General guidance is provided in Section 4 on a system approach, and Section 5 explains the requirements that form an SMS. Section 6 outlines operational activities.

2 Purpose of the SMS

The overall purpose of the SMS is to ensure that the railway organisation achieves its business objectives in a safe manner. These objectives need to be fulfilled in today's ever changing and complex railway environment, giving evidence that the organisation complies with all of the safety obligations that apply to it.

It is recognised that there are wide benefits of managing business in a structured way. It adds value helping to improve overall performances, introduces operational efficiencies, enhances relations with customers and regulatory authorities, and builds a positive safety culture.

For safety, adopting a structured approach enables the identification of hazards and the continuous management of risks related to an organisation's own activities, with the objective of preventing accidents. When appropriate the SMS should consider the interfaces with external organisations and public bodies. Implementing all relevant elements of an SMS in an adequate way can provide an organisation with the necessary assurance that it controls and will continue to control all the identified risks associated with its activities, under all conditions.

The adequate implementation of an SMS by ROs is a key element for success for the entire railway safety regulatory framework in the state, and it forms the basis on which the CRR issues Safety Management Certificates.

Mature organisations recognise that efficient control of their risks can only be achieved through a process that brings together three critical dimensions: a technical component with the used tools and equipment; a human component of front-line people with their skills, training and motivation; and an organisational component consisting of procedures and methods defining the relationship of tasks. Consequently, a good SMS succeeds in monitoring and improving the risk control measures in the three dimensions.

The implementation of an SMS is a legally binding obligation under Part 4 of the Railway Safety Act. However, ROs must also consider all relevant legislation when implementing their SMS. Nonetheless, there are also other good reasons for implementing and delivering an effective SMS: many features of a light railway SMS are similar to management practice advocated by proponents of quality, safety and health at work, environmental protection and business excellence. Therefore, principles of good management can be easily integrated and should not need a complete re-design of organisations that already have those systems in place.

3 SMS scope and legal basis

Designing and implementing an adequate SMS is a challenging task. This guidance, developed by the CRR is heavily influenced by the European Railway Agency document on safety management system requirements for safety certification or safety authorisation available from their website. It is intended to support, through practical advice and suggestions, the design, implementation and delivery of a structured and organisation-wide railway SMS. The overall aim is to provide a tool for the ease of use by light railway operators/maintainers and, at the same time, facilitate compliance with the legal requirements. It is intended to be read in conjunction with all applicable legislation.

NOTE: This document in itself is not mandatory; however, requirements stipulated by the Railway Safety Act, 2005, as amended, are to be complied with.

In this guidance document, the following terms are used with the intent described, below:

'shall' indicates that a statement is mandatory. It is used only for direct quotation of the legal text.

'should' indicates a recommendation.

'may' indicates the existence of an option.

The legal basis for the implementation of an SMS by ROs is the Railway Safety Act, 2005, as amended.

A Safety Management System can be defined as "the organisation and arrangements established by an RO to ensure the safe management of its operations.". Responsibility for the safe operation of a light railway system, and the control of risks associated with it, rest with the RO. They are obliged to implement necessary risk control measures to apply safety rules and standards, and to establish safety management systems.

1. The safety management system of any RO and specifically in a light rail context shall take into account the effects of on-street running and make provisions to allow all road users to operate in accordance with road safety rules. It shall furthermore be developed with the aim of coordinating the emergency procedures with the relevant authorities.
2. Each year ROs should submit to the CRR before 31st May an annual safety report concerning the preceding calendar year. The safety report shall contain:
    a) information on how the organisation's corporate safety targets are met and the results of safety plans.
    b) the development of national safety indicators, as far as it is relevant to the reporting organisation.
    c) the results of internal safety auditing;
    d) observations on deficiencies and malfunctions of light railway operations and infrastructure that might be relevant for the safety authority.
3. Requirements on the safety management system:
   The safety management system must be documented in all relevant parts and shall in particular describe the distribution of responsibilities within the organisation of the RO. It shall show how control by the management on different levels is secured, how staff and their representatives on all levels are involved and how continuous improvement of the safety management system is ensured.

The SMS shall ensure the control of all risks associated with the activity of the RO, including the supply of maintenance and material and the use of contractors. Without prejudice to existing national and international liability rules, the SMS shall also take into account, where appropriate and reasonable, the risks arising as a result of activities by other parties.

4. Basic elements of the safety management system:
   The basic components of a safety management system include:
   a) a safety policy approved by the organisation's chief executive and communicated to all staff;
   b) qualitative and quantitative targets of the organisation for the maintenance and enhancement of safety, and plans and procedures for reaching these targets;
   c) procedures to meet existing, new and altered technical and operational standards or other prescriptive conditions as laid down:
      i. in other relevant rules, or
      ii. in authority decisions,
   d) and procedures to assure compliance with the standards and other prescriptive conditions throughout the life-cycle of equipment and operations;
   e) procedures and methods for identifying risks, carrying out risk evaluation and implementing risk control measures whenever a change of the operating conditions or new material imposes new risks on the infrastructure or on operations;
   f) provision of programmes for training of staff and systems to ensure that the staff's competence is maintained and tasks carried out accordingly, including arrangements with regard to physical and psychological fitness
   g) arrangements for the provision of sufficient information within the organisation and, where appropriate, between organisations operating on the same infrastructure;
   h) procedures and formats for how safety information is to be documented and designation of procedure for configuration control of vital safety information;
   i) procedures to ensure that accidents, incidents, near misses and other dangerous occurrences are reported, investigated and analysed and that necessary preventive measures are taken;
   j) provision of plans for action and alerts and information in case of emergency, agreed upon with the appropriate public authorities;
   k) provisions for recurrent internal auditing of the safety management system.

   Additionally, in accordance with section 39(7) “a safety management document shall contain the title and office address of one person in a senior management position within the railway organisation who is responsible for ensuring, and has sufficient authority to ensure, that the undertaking implements the provisions of its safety management document.”

4 A systems approach

4.1 Content of the SMS

ROs should ideally design their SMS in a manner to comply with the requirements described in this guidance document. ROs should use the requirements described in this guidance document to check correspondence with their own organisation, in order to inform decisions on necessary actions to ensure compliance with the above-mentioned requirements.

An RO's SMS, in common with the concept of management systems, should contain a description of safety related processes and procedures, all of which shall be capable of assessment and independent audits.

The table below outlines the SMS requirements that form an SMS.

Ref.	High Level Requirement Section	Sub Requirement Section
1	Context of the organisation	
2	Leadership	
2.1		Leadership & commitment
2.2		Safety Policy
2.3		Organisational roles, responsibilities, accountabilities and authorities
2.4		Consultation of staff and other parties
3	Planning	
3.1		Actions to address risks
3.2		Safety objectives and planning
4	Support	
4.1		Resources
4.2		Competence
4.3		Awareness
4.4		Information and communication
4.5		Documented information
4.6		Integration of human and organisational factors
5	Operation	
5.1		Operational planning and control
5.2		Asset management
5.3		Contractors, partners and suppliers
5.4		Management of change
5.5		Emergency management
6	Performance Evaluation	
6.1		Monitoring
6.2		Internal auditing
6.3		Management review
7	Improvement	
7.1		Learning from accidents and incidents
7.2		Continual improvement

Table 1: SMS Requirements, based on Commission Regulation (EU) 2018/762

4.2 Adoption of a system approach

The purpose of the safety management system is to ensure that the railway organisations achieve their business objectives in a safe manner. The safety management system is often integrated with other management systems, e.g., a quality management system, to increase the overall performance of the organisation and reduce costs while mutualising the efforts at all levels of the organisation. Hence the adoption of a system-based approach.

The requirements identified in Table 1 above are extracted from the European Common Safety Method (CSM) on safety management system requirements, (EU) 2018/762. The CRR consider this as best practice and they are the basis upon which your SMS will be assessed by the CRR. Consequently, all ROs are strongly encouraged to adopt the CSM SMS as a means to demonstrating their SMS is fit for purpose.

5 SMS Requirements

The Safety Management System implemented by ROs should contain the characteristics and address the requirements listed in Section 4 (Table 1). Below are some high-level steering points to consider in respect of the seven requirement sections. Further detail on what should be included / addressed may be found in Annex I and Annex II of Commission Regulation (EU) 2018/762 on a common safety method on safety management system requirements. Note, the CRR have adapted the CSM SMS requirements for light rail ROs, and welcome feedback on any further amendments or additions to be considered.

Context of the Organisation [1] is all about defining/describing your organisation, describing what it does, how it does it and where it does it.

Every organisation needs strong and effective **Leadership and commitment [2]** that ensures safety objectives are set and prioritised (Plan), that practices are implemented to meet safety targets (Do), that the system effectiveness is constantly checked (Check) and that corrective and/or proactive measures are taken (Act). Management commitment implies the direct participation by the highest level management in all specific and important safety aspects or programmes of an organisation. They should be seen and heard proactively promoting the SMS and safety in general. They should formulate and establish a safety policy with SMART objectives and targets to improve or maintain safety. They should engage with staff at all levels within the organisation and promote a positive safety culture throughout.

The SMS should be based on a clear **distribution of responsibilities [2.3]** and on adequate human and technical resources, in order to deliver safe operations.

ROs should clearly identify and define the areas of responsibility related to railway safety, in order to allocate them at the appropriate level, within their organisational structure, to associated staff and/or specific functions.

Delegation of responsibilities and safety tasks should be formal and approved by the senior/top management and by the staff member responsible for the specific function and safety task [i.e. Safety Responsibility Statements]. An organisation needs to ensure that staff with delegated responsibilities has the authority, competence and appropriate resources to fulfil their function. Therefore, responsibility and competence should be coherent and compatible with the given role/task.

Within any organisation, **staff involvement and consultation [2.4]** is a key element in developing safety culture, gaining staff confidence and encouraging cooperation, support and acceptance.

Employee and **staff representative** consultation during drafting of the company safety policy is recommended. Employees and their representatives should also be consulted in the development of risk control strategies, particularly for risks that they have identified. They should also be involved in setting annual safety targets, identifying associated safety initiatives and engaged in the review and update to the company SMS.

Employees should be informed of actions that are being taken or that are planned to address the safety issues and concerns they have identified. Feedback is essential to ensure continued participation.

Planning [3] is key to the success of any business / organisation. For organisations that provide critical infrastructure services such as our railways, the management of risk should be forefront. **Risk assessment [3.1]** can help to identify and manage current/existing risk and anticipate future developments and threats such as potential disruptions, pressures and their consequences. Unforeseen events, not identified when designing the risk control measures, may take place. Risk control measures can, because of a changing environment (external, e.g. new technologies, rules, standards, etc.; and/or internal, e.g. new or changing techniques, operational procedures, organisational structure, etc.), no longer fulfil the intended purpose. Additionally, changes in the general management arrangements and structure may impact on the SMS. Qualitative and/or quantitative risk assessment should be considered as methods to assess risk commensurate with their complexity, novelty etc.

The most valuable asset an organisation has is its people and **Support [4]** is critical to them thriving and making the organisation a success. The organisational structure of ROs should be appropriate to deliver the safety policy and safety approach of the organisation. Good planning of activities will significantly improve the way that organisations manage safety, by providing the sufficient and right (human and technical) **resources [4.1]** to complete tasks.

The SMS may benefit of having procedures for estimating the necessary resources that the company will need to operate and maintain its rail operations and to implement, manage and maintain its SMS as a whole.

In the case of safety-critical tasks, the job design is important and should take into account the volume of tasks to be completed. Other human and organisational factors should be considered and integrated within the SMS.

Competence management [4.2] is vitally important, and a RO must ensure that all staff with a responsibility in the SMS is competent to ensure a safe, effective and efficient delivery of its objectives, in all circumstances, and that staff skills and knowledge are maintained. Consequently, there should be a competence management system that identifies tasks to be undertaken and the knowledge, skills and experience required to perform them together with any identified initial and/or periodic training and assessment.

It is also important that the competence management system aims at ensuring that all staff are aware of the relevance and importance of their activities and how they contribute to the achievement of the safety objectives. Senior management / top team and, in general, supervisory roles should be trained in understanding their safety responsibilities.

The sharing of **Information [4.4]** throughout an organisation promotes an open transparent safety culture. Organisations must define information control procedures, based on existing management systems. Safety information must be readily available for consultation and/or verification. The necessary flow(s) of internal and external information have to be identified and acted upon.

Measures to control vital safety information (configuration control) are important to maintain and improve safety performance within an organisation. The availability of correct information enables awareness and allows for corrective actions to be taken promptly and efficiently.

Asset management [5.2] is the systematic and co-ordinated activities and practices undertaken by a company to manage assets that are a key or critical factor in achieving effective service delivery and their associated risks in an optimum manner to achieve its strategic and regulatory objectives.

Successful asset management involves identification of the assets owned or managed by a company. In general, the following types of assets are identified:

- Physical assets; e.g. buildings, networks, infrastructures, equipment,
- Human assets; e.g. people skills, career paths, training, reporting, mentoring, competencies,
- Financial assets; e.g. cash, investments, liabilities, cash flow, receivables, etc.,
- Intangible assets; intellectual property assets and relationship assets,
- Information assets; digitized data, information, and knowledge about customers etc

Asset management refers to the policies, strategies, information, plans and resource, which integrate to deliver efficient operation, and the put in place of the above-mentioned activities and practice to ensure that assets remain in condition to allow the operation to deliver its business objectives safely, effectively and efficiently during all its life-cycle.

The outcome of competent asset management is asset integrity, i.e. assets that are fit for their purpose and whose risk of failure is managed to meet an appropriate standard of performance.

Where **contractors, partners & suppliers [5.3]** are relied upon to undertake activities relating to operating safety, the RO must control the delivery of safe supplies and services provided by these parties. ROs are expected to have robust selection criteria, together with effective monitoring arrangements. The management of safety information and effective communication is also key to successfully engaging outside parties.

Change management [5.4] is the process to control changes to plant, equipment, infrastructure, rolling stock, operations or the organisation by identifying potential hazards and defining appropriate control measures before implementing a change.

This process should also be carried out after any change has been implemented to check that it has been done correctly and that it delivers expected outcomes and does not decrease the level of safety in the system.

When additional risk control measures are to be implemented, relevant intermediate steps need to be identified and the level of implementation needs to be measured. In each case, the change management has to be carried out taking into account risk assessment.

Emergency preparedness [5.5] plans, processes and procedures should exist to address all reasonably foreseeable events. Plans should be periodically reviewed tested for example through joint exercises and updated as required.

Interfaces with external parties / agencies should be known and relationships established with them as necessary. Business continuity and staff trained in degraded situations should also be features captured in an ROs SMS.

Performance Evaluation [6] through effective **internal auditing & monitoring** of both the performance of operational processes and of the operating environment is necessary to identify latent system failures, which are those system elements that are or could become a threat in the near term.

Monitoring supports the return of experience, which is an important complement for the continual reflection upon risks.

Systematic monitoring should provide assurance to managers and stakeholders that all identified risks are effectively controlled and evidence that the SMS requirements are being met. It provides the basis for defining any action needed to improve or maintain the targeted level of safety. ROs should therefore establish suitably robust internal auditing/monitoring systems, using competent and experienced Auditors.

In order to ensure that risk controls are applied and work in practice, an organisation needs to measure the level of application of these controls and their results. The collection of safety data and the subsequent analysis allow the organisation to measure its overall performance, understanding where there are deficiencies in all SMS arrangements.

In general, **management control/review [6.3]** is a means by which an organisation's resources are directed, monitored, and measured. It aims at helping the organisation to accomplish, in the specific area of safety, its specific targets or objectives.

For the top management it is therefore crucial, not only to ensure safety but also to fulfil its commitment and legal obligations to improve railway safety, to be aware of the results of performance monitoring, auditing and monitoring and the learnings from accidents and incidents, and to take overall responsibility for implementation of changes to the risk control measures and relevant SMS processes.

Improvement [7] as the title suggests is about continuously learning and improving ones SMS. As a general principle, internal auditing serves the purpose of periodically reviewing the management system. In particular, internal inspections, safety tours, safety audits etc should assess if the procedures described within the SMS are being applied and are effective. Corrective & preventative actions should be taken in instances where there shortcomings are identified. The most common representation of this cyclic activity is the 'Plan – Do –Check – Act' management circle, or Deming cycle.

Audits should be carried out in an impartial, independent and transparent way: auditors should be independent from the organisational unit being audited and conflict of interest between the assessing and the assessed party should be avoided.

Another important area where one can learn is following **accident & incidents [7.1]**. Learning from accidents and incidents together with findings from audits, inspections, and all other relevant sources of information can be used to improve the system.

Internal accident and incident investigation provides the organisation with a reactive review of the performance of risk control measures and related processes of the SMS (lagging indicators). Therefore not only the immediate causes but also underlying causes are to be systematically investigated.

Standardised arrangements for when and how investigations are carried out should include procedures for notification to the safety authority and/or the national investigation body, procedures, formats and approaches (e.g., site protocol) for investigations, procedures for reporting and documenting findings, conclusions and recommendations and procedures for reviewing risk control

measures after an accident or incident, and for ensuring implementation of recommendations and preventive or corrective actions in order to prevent recurrence.

Organisations should encourage reporting of incidents and dangerous occurrences and also establish accountability, whilst adopting a just culture, during its investigation. The scope of incidents investigated includes process anomalies (leading indicators) and deviance from expected outcomes (lagging indicators) where appropriate.

ROs should ensure that the staff appointed for internal investigation are competent and duly trained for the scope of investigation to be carried out.

5.1 Compliance with legislation, rules, and standards

Compliance with legislation and rules is not an option. ROs must identify and understand the applicable laws and all other relevant standards and prescriptive conditions and must implement a system of controls to achieve compliance.

It is crucial that all safety related procedures and processes of the SMS are:

- designed to comply with the regulatory framework and updated to take into account any variation or addition;
- consistent with type and extent of services operated by the organisation;
- consistent with relevant organisation changes.

To ensure this, a SMS should include a legal register and have a process/procedure in place to promptly identify, gather and list, relevant new/updated legal requirements.

5.2 Annual safety report

The annual safety report is a summary of information that the RO should provide to the CRR.

The annual safety report includes:

(a) information on how the organisation's corporate safety targets are met and the results of safety plans;
(b) the development of safety indicators, as far as it is relevant to the reporting organisation;
(c) the results of internal safety auditing;
(d) observations on deficiencies and malfunctions of light rail operations and infrastructure management that might be relevant for the safety authority.

It is important to note that:

- The corporate targets may tend to improvement or maintaining of safety performance, resulting from the analysis of past performances;
- “safety plans” are documents containing a list of actions with expected result, relevant timeframe and allocation of responsibilities, identified in order to pursue improvement in performance or maintaining of an adequate level of safety;

- safety indicators are the set of data to be collected in order to evaluate an LRO's safety performance. LROs collect data according to their area of activities and the relevance to it.

6 Operational activities

Operational activities should ensure that service is delivered in compliance with applicable rules. Typical operational processes (the list is not exhaustive) refer to:

- Traffic planning,
- Traffic management in normal, degraded and emergency situations,
- Rail vehicle preparation,
- Rail vehicle driving in normal and degraded situation,
- Infrastructure (track and signalling) maintenance,
- Rail vehicle fitness for operation.

The risk control measures, be they technical, human, organisational or every possible combination of these - are an integral part of the operational activities. They should be built into the system to make it able to deliver normal operation and respond adequately to regular and irregular disruptions and disturbances, e.g. by adjusting its functioning to better match the new conditions, by mitigating the effects of an adverse event, by preventing a further deterioration or spreading of events, by restoring the state that existed before the event, etc.

The use of processes for implementation on a continuous basis ensures that each operational activity is performed as it was intended to.

7 Making an application

For further details on making an application to CRR please refer to CRR-G-030 on an Application Guide for Single Safety Certificates, Safety Authorisation and Safety Management Certificates.