DEPARTMENT OF TRANSPORT

NO. 6632 19 September 2025

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

DETERMINATION IN TERMS OF SECTION 37 OF THE RAILWAY SAFETY ACT, 2024 (Act No.30 OF 2024)

Second Edition

Date: September 2025

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

RAILWAY SAFETY REGULATOR

The Railway Safety Regulator, hereby in terms of section 37 of the Railway Safety Act, 2024 (Act No. 30 of 2024) publishes the determination of the format, form, and content of a safety management system that is required for the different categories and types of safety permits as well as the form, content, and manner of submission of a safety management system report.

The determination for SMS and SMSR is published for compliance and general information with effect from the date of publication.

Digitally signed
by MS Ekeke
Date: 2025.09.09
15:23:27 +02'00'

Ms Nompumelelo Ekeke
Chairperson: RSR Board
Railway Safety Regulator
Date: September 2025

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

TABLE OF CONTENTS

REVISION HISTORY 5
ACKNOWLEDGEMENTS 6
ABBREVIATIONS 7
DEFINITION OF TERMS 7
NORMATIVE REFERENCES 10
1. INTRODUCTION 11
2. SMS PURPOSE 12
3. LEGAL BASIS 13
4. SMS SCOPE AND CONTENT 14
5 SAFETY MANAGEMENT APPROACH AND SAFETY POLICY 15
5.1 Safety Policy 16
5.2 Safety culture 17
5.3 Integration of Human Factor Management across the Safety Management System 19
6. LEADERSHIP, MANAGEMENT AND ORGANISATIONAL DESIGN 21
6.1 Organisational structure and delegation of authorities 24
6.1.1 Workload planning and management 27
6.1.2 Safe working conditions and fitness for duty (working conditions and worker) 29
6.2 Management commitment and control (monitoring & review) 31
6.2.1 Decision taking & participation of workers and representatives. 32
6.2.2 Risk-based safety improvements (safety objectives and targets, monitoring, and improvements) 35
7. RISK MANAGEMENT WITHIN OPERATIONS/ PROCESS CONTROL 38
7.1 Processes and procedures for safe, compliant, and effective operations (Operator specific) 39
7.1.1 Safe, compliant, and efficient management of risks in railway assets across the life cycle 42
7.1.1.1 Railway Asset Management across life cycle 42
7.1.1.2 Compliance with legislation, rules, and standards 44
7.1.1.3 Risk management processes and procedures across SMS 46
7.1.1.4 Transportation of Dangerous Goods 49
7.1.1.5 Security Management 51
7.1.2 Management of contractors and suppliers involved in design, procurement, operation, maintenance of operations. 53

7.1.3 Interoperability and management of interfaces (interface and intraface management) 55
7.1.3.1 The coordination tasks for the Network Operator within the SMS 56
7.1.4 Occurrence management (recording, reporting, and investigation of occurrences) 58
7.1.5 Emergency response and contingency planning and preparedness 60
7.2 Information Management 62
7.2.1 Requirements on the structure of the SMS report 63
7.2.1.1 The structure and content of a SMS report 64
7.2.1.2 General/ Business Overview 65
7.2.1.3 Annual Safety Improvement Plan 68
7.2.2 Document management & configuration control/ Storing information. 70
7.2.3 Communication (internal and external) 72
7.3 CONTINUOUS IMPROVEMENT AND ORGANISATIONAL LEARNING 73
7.3.1 Safety data collection and analysis to review and continuously improve SMS. 76
7.3.1.1 Review of the SMS 78
7.3.1.2 Internal Auditing of the SMS 79
7.3.1.3 Management of Change 80
8. EXEMPTIONS 94
8.1 Temporary Safety Permit 94
8.2 Construction Train Safety Permit 94
8.3 Test and Commissioning Safety Permit 94
ANNEXURE A: Safety Management System (SMS) Wheel Overview Of The SMS Determination 95
ANNEXURE B: Common Safety Method on Risk Assessment (CSM-RA) Guideline 96

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

REVISION HISTORY

DATE PUBLISHED	DOCUMENT NAME	VERSION DESCRIPTION
May 2018	Safety Management System (SMS) Determination	SMS Determination first published
September 2025	SMS Determination Second Edition	First review of the SMS Determination

ACKNOWLEDGEMENTS

The Railway Safety Regulator wishes to acknowledge the valuable assistance of the following organisations in the preparation of this document:

AECI Mining Explosives

BMW Group South Africa

Bombela Operating Company

Eswatini Railways

Exxaro Resources (Grootegeluk)

Footprint Ergonomics

Pindulo VDM Pty Ltd

PRASA

R & H Rail

Railway Safety Solutions

Richards Bay Coal Terminal

RSC Consulting

RSMS Consulting

Smart Ergonomics

Transnet SOC

Traxtion

Umfolozi Sugar Planters Ltd

United Manganese of Kalahari

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

ABBREVIATIONS

ALARP	As Low As Is Reasonably Practicable
ASIP	Annual Safety Improvement Plan
ICP	Independent Competent Person
Regulator	Railway Safety Regulator
RSR	Railway Safety Regulator
SANS	South African National Standard
SMSR	Safety management system report
SMS	Safety Management System
SPCAM	Safety Permit Conformity Assessment Methodology
SV	Safety Validation

DEFINITION OF TERMS

Term	**Definition**
Act	Railway Safety Act, 2024 (Act No.30 of 2024)
Abnormal working	Abnormal working is the deviation from the train's normal working on a portion of the network that may or may not impact the service capacity.
Dangerous Goods	Means the commodities, substances, and goods that can pose a significant risk to the health and safety of persons or damage to property or the environment that are listed in the appropriate standard specification of the South African Bureau of Standards as identified by the Minister by notice in the Gazette.
Degraded mode	Degraded mode is any deviation from the primary mode of train movement on a portion of the network, including the condition of

Term	Definition
	the rolling stock and railway infrastructure elements, which impact on service capacity, but which are still safe.
Determination	The Determination of a Safety Management System (SMS) and Safety Management System Report (SMSR) (2018), which makes it mandatory for railway Operators to document, implement and maintain their SMS and SMS Report as prescribed by Section 37 of the Railway Safety Act, 2024 (Act No.30 of 2024).
Human Factors	Human factors (or ergonomics), as defined by the International Ergonomics Association (IEA), is the "scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design in order to optimize human well-being and overall system performance".
Legislation	A general term for laws, statutes, or Acts.
Network Operator	Means the person or persons who have the ultimate accountability for one or more of the following: a) the safety of a network or part thereof including the proper design, construction, maintenance, and integrity of the network, b) ensuring compliance of rolling stock with the applicable standards of the network, or c) for the authorising and directing of the safe movement of rolling stock on the network.
Operator (Railway Operator)	Means a Network Operator, Train Operator or Station Operator or a combination of two or three of them.
Organisation	An organised group of people with a particular purpose, such as a business or a government department.

Term	Definition
Safety critical employees	Functions and activities directly related to the authorization and control of rolling stock movements, and to the execution of the movement of rolling stock, including the direct supervision of persons undertaking these functions and activities.
Safety targets	Safety targets set for identified Key Performance Indicators (both leading and lagging indicators) which inform the Operator of the level of safety performance.
Safety related work	Functions and activities that have an impact on safe railway operations, either directly (safety critical work) or indirectly, including the certification of systems, subsystems or components for introduction as new or modified technologies for a network, train or station operation (or a combination thereof), or the maintenance of systems, subsystems or components which constitute a network, train or station operation (or a combination thereof), including the direct supervision of persons undertaking these functions and activities.
Safety Management System report (SMSR)	The Act (Act 30 of 2024 Section 37) defines a safety management system report (SMSR) as a "written submission made by the applicant, in support of a safety permit application that describes the applicant's safety management system (SMS) and may include any other matters prescribed".
Safety management system (SMS)	Safety Management System: "a formal framework for integrating safety into day-to-day railway operations and includes safety goals and performance targets, risk assessment, responsibilities and authorities, rules and procedures, monitoring and evaluation processes and any matter as prescribed."
Station Operator	Means a person in control of a station, and the management of a station.

Term	Definition
Train Operator	Means a person or persons who have the ultimate accountability for a) the safe movement of rolling stock on a network, b) safety and integrity of rolling stock, and c) safety of freight or persons being conveyed.

NORMATIVE REFERENCES

The requirements set out in the SMS Determination shall be implemented in conjunction with other relevant legislation, regulations, and standards, including, but not limited to, the following:

i. Railway Safety Act, 2024 (Act No.30 of 2024).
ii. Railway Safety Regulations
iii. SANS 3000 Series of Standards
iv. SANS 10405 - Transportation of Dangerous Goods by Rail
v. RSR Series of Standards
vi. RSR Permit Application Guide.
vii. RSR National Information Management System (NIMS)
viii. Occupational Health and Safety Act 85 of 1993
ix. Mine Health and Safety Act 29 of 1996
x. Basic Conditions of Employment Act 75 of 1997

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

1. INTRODUCTION

1.1. The Railway Safety Act, 2024 (Act No.30 of 2024) stipulates in Section 30(10) that "any person who undertakes a railway or railway operation without a valid safety permit is guilty of an offence". Operators who intend to apply for a safety permit must provide evidence of a Safety Management System (SMS) that conforms to the minimum requirements as determined by the RSR in this SMS Determination.

1.2. The purpose of the SMS Determination is to provide detailed SMS requirements that must be met by Operators that wish to apply for, maintain, and renew a railway safety permit with the Railway Safety Regulator (RSR). The requirements outlined in the SMS Determination also serve as the foundation upon which safety oversight activities are conceptualised, designed, and executed by the RSR.

1.3. Designing and implementing an adequate SMS is a challenging task, and therefore, this directive, adopted by the Railway Safety Regulator, is intended to support, through practical advice, the design, implementation, and delivery of a structured and organisation-wide railway SMS. The overall aim is to provide a tool for ease of use by Operators and, simultaneously, to facilitate compliance with the legal requirements. This SMS Determination should be read in conjunction with other relevant legislation, regulations, and standards, including, but not limited to, the SANS 3000 series of standards and the RSR series of standards. This document reflects the effort to present an emerging view on this dynamic and important subject through this determination in a simple and user-friendly manner. It also refers to mandatory and guidance connected documents on the implementation of safety management systems.

1.4. A Safety Management System is defined in the Act as a "a formal framework for integrating safety into day-to-day railway operations and includes safety goals and performance targets, risk assessments, responsibilities and authorities, rules and procedures, monitoring and evaluation processes and any other matter prescribed." The Act further stipulates that as "a formal framework for integrating safety into day-to-day railway operations. It includes safety goals and performance targets, risk assessments, responsibilities and authorities, rules and procedures, monitoring and evaluation processes and any other matter prescribed."

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

2. SMS PURPOSE

2.1 The overall purpose of the SMS is to ensure that the Operators achieve their business objectives in a safe manner. It is recognised that there are wide benefits to managing a business in a structured way. The Safety Management System (SMS) adds value by improving overall performance, introducing operational efficiencies, enhancing relationships with customers and regulatory authorities, and fostering a positive safety culture. In terms of safety, a structured approach allows for the identification of hazards and ongoing risk management related to an organisation's activities, to prevent accidents. When applicable, the SMS should account for interactions with other operators in the railway system. Proper implementation of all SMS elements ensures that the organisation effectively manages, and controls all identified risks under any conditions.

2.2 The adequate implementation of an SMS by all Operators is a key element for the success of the entire Railway Safety Regulatory framework, as foreseen by The Act, since it forms the basis on which the Railway Safety Regulator issues safety permits. Mature organisations thereby recognise that an efficient control of its risks can only be achieved through a process that brings together three critical dimensions: a technical component with the tools and equipment used, a human component of front-line people with their skills, training, and motivation, and an organisational component consisting of policies, processes, 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.

2.3 Implementing a Safety Management System (SMS) is a legal requirement under the Act. Additionally, there are several compelling reasons for establishing and maintaining an effective SMS: many features of the railway SMS are very similar to management practices 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.

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

3. LEGAL BASIS

3.1 Section 30 (1) of The Act (Act 30 of 2024) stipulates that an application for a safety permit must be made in the format prescribed by the Regulator. Section 37(1) of The Act stipulates that the RSR must determine "(a) the form and content of a safety management system that is required for the different categories and types of a safety permit; (b) the form, content, and manner of submission of a safety management system report; and (c) the circumstances under which the RSR may require the holder of a safety permit to revise or amend a safety management system or safety management systems report".

3.2 The Act defines a SMS as "a formal framework contemplated in section 37, which integrates safety into day-to-day railway operations and includes consultation, safety goals and performance targets, safety risk assessments, responsibilities and authorities, rules and procedures, and monitoring and evaluation processes".

3.3 The Act defines a SMS report (SMSR) as a "written submission made by an applicant in support of a safety permit application that describes the applicant's safety management system as contemplated in section 37".

3.4 This determination serves as an instruction to Operators to document, implement and maintain their SMS and SMS report in compliance with this determination and other relevant legislation, regulations, and standards, including, but not limited to, the SANS 3000 series of standards, RSR standards and SANS 10405-Transportation of dangerous goods by rail.

3.5 Railway Operators should therefore document their procedures and arrangements in a manner that allows:

i. Assessment thereof prior to issuing the safety permit, and

ii. Implementation, monitoring, and review post-award of the safety permit.

3.6 The SMS Determination is mandatory for Operators and provides guidance on developing and implementing SMSs in accordance with The Act. This includes one or more of the following types of railway Operators:

i. Network Operators,

ii. Train Operators,

iii. Station Operators, and

iv. Any other category of persons designated as requiring a safety permit as prescribed by the Minister by notice in the Gazette.

3.7 Section 31(2) of The Act stipulates that "The Regulator may, subject to subsection 31(3) and in justifiable circumstances, impose special conditions in addition to and not inconsistent with the safety permit conditions contemplated in subsection 31(1) relating to any relevant matter".

3.8 Once this Determination is published as a regulatory tool, it constitutes (a) the form and content of a safety management system (b) the form, content, and manner of submission of a safety management system report; and (c) the circumstances under which the RSR may require the safety permit holder to revise or amend a safety management system or safety management system report.

4. SMS SCOPE AND CONTENT

Railway Operators must develop and implement their SMS in a manner that complies with the requirements set out in this Determination. In instances where Operators are unable to meet the minimum requirements, the RSR may request the Operator to revise or amend its SMS or SMS report (SMSR). An Operator's SMS, in line with the concept of management systems, should contain the description of safety-related policies, processes and procedures, all of which shall be capable of assessment (based on the Safety Permit Conformity Assessment Methodology (SPCAM), which assesses conformity with requirements for obtaining railway safety permits) and independent audits.

4.1 Requirements on the structure of the SMS

Railway Operators must develop and implement their SMS in accordance with the requirements set out in this Determination.

As part of demonstrating their SMS through the SMS Report and for each of the processes, Operators must detail and provide supporting information and evidence of the different policies, processes, procedures, or company standards/rules implemented (or in the phase of implementation), cross-referencing or linked to the items identified. The structure and content of an Operator's SMS and the SMS Report are as follows:

- **PROCESS 1:** Safety management approach and safety policy
    - Sets the strategic intention and approach to managing safety across an operator's system.
- **PROCESS 2:** Leadership, management, and organisational design
    - Provides a framework of requisite elements/ enabling conditions/ factors that have to be in place to support an operator's business objectives.
- **PROCESS 3:** Risk management within railway operations
    - Provides requirements that Operators need to meet to support safe, compliant, and effective railway operations, considering their context and system complexity across all life cycle phases.

5 SAFETY MANAGEMENT APPROACH AND SAFETY POLICY

Railway Operators are socio-technical systems that achieve their objectives through executing various organisational processes. Interactions between people, tasks, equipment/ tools, the environment, and a variety of organisational factors enable these processes. The railway SMS can be identified as the sum of interconnected and interdependent processes and factors that contribute to the design, planning, delivery, and control of operations, as part of a business.

Consistent with the main purpose of an SMS, which is "to ensure the safe management of operations of an Operator in order to deliver continuous safety improvement," it is necessary that safety is managed across the entire system by adopting a systems approach. A systems-based approach consists of the following:

a) processes as interrelated activities which transform inputs into outputs,

b) mapping of processes, including interactions, and

c) a detailed description of processes and sub-processes.

Embedded within the SMS and its individual elements is the requirement to follow the Plan, Do, Check, Act (PDCA) cycle that enables continuous improvement that is driven by a risk-based approach to the management of safety within complex systems. It furthermore encourages organisations to strive to embed safety into daily operations instead of aspiring to only achieve compliance.

5.1 Safety Policy

i. Railway Operators must commit to managing safety in all operations across the life-cycle phases. This commitment must be expressed through a safety policy that applies across the Operator's SMS. The safety policy expresses and reflects an organisation's commitment, obligation (mission) and strategic view (vision) on railway safety and security across the entire SMS.

ii. It must include, among others, a declaration of intent and provide indications on the overall direction for the organisation to follow, the general objectives of the SMS, and the necessary resources and activities required to deliver these objectives. The safety policy must also reflect the following characteristics, thus giving evidence of the organisation's management commitment and providing staff with clear guidance for action to consolidate safety culture and safety awareness within the organisation:

a) is developed by management with the involvement of staff and is signed by the highest level of the organisation.

b) must include a commitment to adopt a systems approach in the management of safety across the organisation.

c) is appropriate to the nature and scale of the organisation's risks and contributes to all aspects of business performance as part of a demonstrable commitment to continuous improvement,

d) outlines the principles and core values according to which the organisation and staff operate,

e) pursues the development and improvement of working ethics,

f) is aligned with other operational policies,

g) reflects the responsibilities and accountabilities of directors, managers, and employees to railway safety,

h) must be reflected in all staff's actions and decisions and reviewed periodically.

i) must include a commitment to integrating human factors across the entire SMS.

j) must be led by management and involve all relevant personnel representatives,

k) must include a commitment to developing and maintaining a positive safety culture and continuously improving all aspects of the SMS.

iii. The safety policy must be communicated and made available to all staff using an appropriate medium (formal communication, displayed on notice boards, newsletter, intranet, etc.).

5.2 Safety culture

i. Safety culture emerges from and is a product of all aspects of the way things are in an organization. In everyday language, culture is “the way we do things around here.” A positive safety culture is characterised by awareness, assessment, and action on safety matters as a part of everyday business, at every level of an organisation and supported by an open communications style throughout the organization. A positive safety culture is fundamental to an effective SMS, and the SMS must specify the methods that will be used as far as is reasonably practicable to promote and maintain a positive safety culture. An organisation with a positive safety culture is characterised by:

a) communication founded on mutual trust.

b) shared perceptions of the importance of safety; and

c) efficacy of preventive measures.

ii. Key elements of a positive safety culture which organisations must consider when determining the methods to meet the requirements of the RSR and to promote and maintain such a culture are:

a) committed leadership: the organisation's leaders, from its senior executives to line managers, actively encourage and participate in safety initiatives and activities. This may be through events and communications, staff mentoring, resource provision, or safety incentives and awards.

b) keeping people informed: the organisation's members, both managers and workers, know what is going on in their organisation. This includes collecting, analysing, and disseminating relevant information derived from the workforce, safety occurrences, near misses, and regular proactive checks of the organisation's safety activities.

c) maintaining vigilance: the organisation's members are constantly on the lookout for unexpected system behaviours, events, and outputs. They focus on problems and issues as they emerge, well before they can escalate to more serious occurrences. Members are prepared to look upon these potential risks as a sign that the system might not be as healthy as it should or could be.

d) promoting a "just culture" environment: the organisation promotes a 'just culture' which acknowledges human error and the need to manage it by supporting systems and practices that promote learning from past errors or mistakes. It encourages uncensored reporting of near-miss occurrences and worker participation in safety issues. A 'just culture' is transparent and establishes clear accountability for actions. It is neither 'blame-free' (awarding total immunity for actions) nor 'punitive' (enacting a disciplinary response regardless of whether acts were intentional).

e) promoting organisational flexibility: the organisation can adapt effectively to meet changing demands. This relies on being prepared for and practiced in handling changing circumstances with people competent to lead and carry out tasks. Flexibility allows local teams within the Operator's SMS to operate effectively and autonomously when required, without the need to adhere to unnecessarily inflexible rules.

f) encouraging willingness to learn: the organisation is willing and eager to learn from its workers, its own experiences and from corporate safety databases. The key here is that organisations and their members use the information to improve safety and act on the lessons derived. In developing and maintaining a positive safety culture, account must be taken of:

- the importance of leadership and commitment of senior management.
- the executive safety role of line management.
- the need to involve safety critical employees at all levels.
- the need for openness of communication.
- the need for human factors to be positively addressed.

5.3 Integration of Human Factor Management across the Safety Management System

i. The SMS must include procedures to ensure that human factors requirements are considered across all life cycle phases of the SMS and to integrate human factors principles and knowledge into all relevant aspects of the operational and business systems. (Refer to SANS 3000-4 for detailed requirements on Human Factors Management, Section 34, 35, and 68 of the Act for additional guidance on managing safety-critical grades persons and operations, and other relevant legislation).

ii. The SMS must integrate human factors by embedding it within risk management systems and processes across the organisation's life cycle. Risk assessments and reviews of risk assessments should identify those areas where system design causes safety risks through sub-optimal interactions between humans and various elements of the system.

iii. The Operator must provide processes and procedures that ensure the systemic identification and analysis of relevant human factors issues and the application of appropriate tools, methods, and measures to address such issues. The management of human factors issues should not be seen as a stand-alone activity. Integration of human factors is regarded as essential in many aspects of operational and business systems that make up the SMS.

iv. Human factors integration processes must be planned and implemented across all railway operations and throughout the life cycle stages, particularly during concept phases where the greatest impact can be borne in terms of safety, productivity, and quality gains.

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

6. LEADERSHIP, MANAGEMENT AND ORGANISATIONAL DESIGN

i. Strong and effective leadership ensures that safety objectives are established and prioritised (Plan), appropriate practices are implemented to meet these safety targets (Do), the effectiveness of the system is consistently monitored (Check), and corrective or proactive measures are taken as needed (Act). By demonstrating strong leadership and management and establishing an appropriate, well-resourced organisational structure, Operators can create the necessary foundation to support and maintain safe operations within their Safety Management System (SMS).

ii. Strong and active leadership is reinforced by visible, active commitment from the higher management levels within the Operator's system:

a) establishing effective 'downward' and 'upward' communication systems,

b) establishing effective management structures,

c) integrating safety management with business decisions.

iii. Safety Management Systems cannot exist or operate effectively without the continued commitment from management/leaders at all levels of the organisation. The responsibility for leadership and for creating an environment of continuous improvement belongs to all levels of management, but particularly to the highest levels. Concerning the safe operation of the railway system in a continuously changing internal and external environment, senior management should be aware of how the success of the organisation depends largely on the ability to monitor and continuously improve the effectiveness of risk management within operations. If senior management does not express informed, sustained commitment to safety as one of the primary business objectives, the commitment to safety in the field can easily shift towards other, sometimes conflicting, business objectives at the expense of safety.

iv. Management commitment implies the direct participation by the highest-level management in all specific and important safety aspects or programs of an organisation. To meet their responsibilities, leaders need to understand the risks associated with the Operator's railway operations, the obligations under the Act, and the level of compliance being achieved with those obligations. Appropriate governance and internal control arrangements ensure that information required to

manage rail operations safely and monitor compliance with The Act is available to the right level and people within an organisation so that decision-making is effective.

v. The SMS must include systems and procedures to ensure that the CEO and Board, or the people managing the railway operations:

a) have sufficient knowledge of the risk profile of the railway operations being carried out, to enable proactive management of the risks of those railway operations.

b) have sufficient knowledge of the level of compliance being achieved with the Operator's duties and obligations under The Act and applicable prescripts; and

c) have sufficient knowledge to determine whether: (a) the SMS is working effectively; (b) the safety risks are being identified, assessed, and eliminated or controlled; and (c) controls to monitor and manage safety risks to ensure that they are regularly reviewed and revised.

vi. The list below shows practices that, among others, demonstrate how management commitment is delivered in practice, through a sequence of safety aspects and, in some cases, the relevant connection to other elements of SMS that are dealt with in the permit application guide. The assessment of management commitment must consider the extent to which the SMS is developed, implemented, and maintained effectively. As such, Operators' ability to demonstrate management commitment must consider the evidence from all the other elements:

a) showing passion and interest for safety,

b) formulating and establishing safety policy and objectives [refer to safety policy],

c) setting targets to improve or maintain safety and benchmarking performance against others in the railway sector or other industries [refer to safety targets],

d) providing resources and training [refer to risk control and to fitness for duty and competence management system]

e) ensuring that all staff – including the CEO and Board, or the people managing the railway operations – are sufficiently trained and competent in their safety responsibilities [refer to fitness for duty],

f) ensuring control at all levels of the organisation [refer to management control],

g) regularly receiving information about safety, e.g., performance data (accidents, incidents, dangerous occurrences), and evaluating and reviewing the SMS considering the results achieved [refer to monitoring],

h) being aware of what is happening on the ground, and what audits or assessments are undertaken, receiving results related to the activities carried out internally or by contractors [refer to internal auditing],

i) ensuring appropriate review of SMS at Board Level [refer to SMS review],

j) ensuring that all levels of the organisation, including the CEO and Board, or the people managing the railway operations, receive relevant safety information [refer to internal and external communication],

k) being confident that the workforce is properly consulted on safety matters, that their concerns are reaching the appropriate level, including, as necessary, the CEO and Board, or the people managing the railway operations, ensuring that your organisation's risks are assessed, and that appropriate control measures are established and maintained [refer to involvement of staff],

l) creating the environment of continuous improvement [refer to continuous improvement],

m) bringing to the attention of the CEO and Board, or the people managing the railway operations, the changes in working arrangements that may have significant implications for safety [refer to change management],

n) promoting safety culture [refer to safety culture].

6.1 Organisational structure and delegation of authorities

i. The design and organisational structure of an Operator must be appropriate to deliver the safety policy and safety approach of the organisation, so that:

   a) Risk controls fit sensibly into the management structure (the design of the structure should cover all internal and external interfaces).

   b) Responsibility for and delivery of (possibly conflicting) business objectives in a safe manner, are transparent and effectively deal with interfaces.

   c) Resources are effectively allocated.

   d) Safety related information reaches all levels of the organisation.

ii. People who are part of the SMS need to know their roles in the system and what they are responsible for. Therefore, the structure must include the identification of responsibilities and assignments, where appropriate, of functions and activities for people. They also need to have the knowledge and skills to know what to do in all circumstances and they need to have all relevant information available in an adequate form. Resource management, particularly the suitability of professional competence and health requirements to perform safety critical or safety related tasks, is a key factor for delivering safe operation.

iii. The requirements for authority and the responsibilities of the Nominated Manager include the following.

   a) The head of the Operator's organisation shall appoint in writing a senior person to be known as the Nominated Manager to fulfil, as a minimum, the following functions:

      - To be a principal point of contact for the Railway Safety Regulator. The Operator shall therefore ensure continuity of the position of the Nominated Manager and shall inform the relevant railway regulator immediately in writing of a change of Nominated Manager, and the steps taken to ensure continuity; and

      - To ensure that the requirements of the relevant legislation, Regulations, the relevant part(s) of the SANS series of standards, RSR standards, other applicable standards, directives, guidelines, and related documents,

including the Operator's relevant internal documentation, are effectively implemented and maintained at all relevant levels in the organisation.

b) The letter of appointment of the Nominated Manager may provide for the further delegation in writing of these responsibilities to responsible persons at depots or plants, without derogating from his accountability. Where appropriate, the Nominated Manager may be supported by a dedicated section in the organisation.

- A letter of appointment only in terms of the relevant legislation, regulations, and standards does not fulfil the operational safety and security requirements of the relevant safety regulator and is therefore not acceptable.
- Provision should be made for the appointment in writing of an acting Nominated Manager if the Nominated Manager is unable to fulfil his duties, with adequate handover arrangements.

c) The authority and responsibility of the Nominated manager shall be demonstrated by the requirements that such manager be mandated by the executive management. The Nominated Manager shall:

- Report directly to the head of the Operator's organisation, or
- Be a member of the executive management.

iv. Each Operator must clearly identify and define the areas of responsibility related to railway safety and allocate them at the appropriate level within their organisational structure to associated staff and/or specific functions. Delegation of responsibilities and safety tasks must be formal and approved by the senior/top management and the staff member responsible for the specific function and safety task. An Operator must ensure that staff with delegated responsibilities have the authority, competence, and appropriate resources to fulfil their function. Therefore, responsibility and competence must be coherent and compatible with the given role/task. Clear authorities, roles, tasks, and objectives for safety at all levels in the railway organisation have an important part in the design and implementation of a SMS by ensuring that staff at all levels take responsibility.

v. It is essential in any management system that each person responsible for implementing the system has a clear understanding of their accountabilities, responsibilities, and authorities in relation to the system (including limits of authority). This must cover the scope of operations at any given time, i.e., business as usual, degraded and emergency situations. To achieve this, the SMS must include documents that describe the responsibilities, accountabilities, authorities, and interrelation of the personnel who manage or carry out rail safety work, or who verify such work. These requirements may be satisfied by organisational charts supported by position descriptions that describe the key dependencies between roles. Similarly, the SMS must support the role of safety personnel by specifying procedures for safety personnel to report safety risks, for example, through safety management committees. Documents that describe the authorities given to safety personnel to enable them to meet their responsibilities must also be included in the SMS.

vi. When assigning responsibilities, accountabilities and authorities, particular account must be taken of the need for:

   a) the nomination of a manager who, irrespective of other responsibilities, is responsible for maintaining, reviewing, and reporting on the organisation's SMS.

   b) individuals to have the necessary authority to execute their responsibilities.

   c) individuals to be held accountable for the execution of their responsibilities.

   d) clear lines of accountability for personnel certifying the safety of critical infrastructure, equipment, and operations.

   e) personnel who manage or carry out work relating to the safety of the railway operations, or who verify such work, should be given the necessary organisational freedom and technical authority to:

      - initiate action to prevent unsafe occurrences.
      - initiate, recommend or provide solutions to railway safety issues through designated channels.
      - initiate action to learn from railway safety occurrences and to prevent any recurrence.

- verify the implementation of solutions.
- control further design, construction, commissioning, operation, or maintenance activities so that any observable deficiency or unsatisfactory railway safety condition is corrected; and
- identify internal verification requirements.

vii. Management accountability

The Operator must ensure that individuals assigned roles, tasks, and responsibilities in safety management are held accountable for achieving the business safety objectives under their responsibility. This involves ensuring that the Safety Management System (SMS) is appropriately designed, implemented, and maintained to support the safe and efficient operation of railway activities. It includes providing safe working conditions, ensuring all personnel are fit for duty, and upholding safety standards throughout all operational processes. It also includes the provision of adequate supervision, in line with monitoring mechanisms, compliments the provision of information, instruction and training to ensure that the safety policy of an organisation is effectively developed and implemented. Good supervision regimes can form a powerful part of a proper SMS.

6.1.1 Workload planning and management

i. Workload is a descriptor of the relationship between the stressors imposed by the task (i.e., task, equipment/ tool demands) and other system factors (i.e., organisational factors, working environment, etc.) in which the task is performed and strain responses which are indicative of the impact of the stress imposed on the individual. The impact of the stressors in this case is intimately affected by the state of the individual in terms of their physical, cognitive, emotional, and psychological conditioning and capacity. Workload is thus an expression of the interaction between the following:

a) the system (i.e., task demands, environmental conditions, time on task and time constraints),

b) the capability of the individual and the individual's characteristics in terms of the resources and information processing capacity available to the task, and

c) the individual's perception of task demands in relation to their capability to achieve task goals and the effort required to meet task demands.

ii. Workload planning and management are necessary parts of managing safety within railway operations and can assist Operators to achieve higher levels of efficiency without compromising the health of employees. Workload planning and management also ensures that employees are not exposed to sub-optimal workload conditions that can negatively impact the safety of railway operations and the health of employees and relevant stakeholders. Good planning of activities will significantly improve the way that organisations manage safety, by providing sufficient and appropriate resources to complete tasks. The SMS must therefore have procedures for estimating the necessary resources that the Operator will need to operate and maintain its railway operations; implement, manage, and maintain its SMS as a whole; and prepare plans to ensure adequate assignment and workload. Such processes must be expected to be part of the normal business planning cycle, and subsequently reviewed, making use of empirical evidence of workload, to ensure that resources are being appropriately managed on an ongoing basis. This will lead to effective risk control as well as to efficient operation.

iii. The management of workload is particularly important for employees involved in safety related work and the management of safety. Operators are therefore required to manage the workload of safety related personnel as part of their risk management. This will require that Operators classify their workforce involved with safety tasks in railway operations into "safety related" grades and "safety critical" grades and submit a list of those grades to the RSR as part of their SMS Report. When work to be assigned includes the execution of safety related or safety critical tasks and decisions, the job design and workload planning and management shall consider the different dimensions of workload and ensure the following:

a) the volume, frequency, nature, intensity, and duration of tasks to be completed are not sub-optimal when a safety critical task is being carried out during normal, abnormal, and emergency conditions.

b) where safety critical tasks are combined, the Operator can demonstrate that safety is not compromised. For example:

- there is no requirement for independence of the combined tasks;
- the combination is permitted by national safety rules; and
- the combination contains no “functional” contradictions.

c) there are no contradictions between the execution of safety critical tasks and other objectives assigned to staff (for example, systematic conflict between safety and production, lack of resources, etc.).

6.1.2 Safe working conditions and fitness for duty (working conditions and worker)

i. The organisational structure is developed as a platform through which the Operator can deliver its railway operations in line with the organisation’s strategy. The SMS must be designed to ensure optimal, efficient, and safe working conditions and systems are in place for the organisational structure to be effective. This necessitates the matching of tools, equipment, machines, systems, tasks, jobs, work processes, workstations, and working environments to ensure that they are fit for safe operations and use by employees and relevant stakeholders.

ii. The process of designing a safe and efficient system requires Operators to ensure that the system is fit for purpose and fit for the users of the system. In addition to providing safe working conditions, this would entail considering the users’ fitness regarding their capabilities, limitations and needs of personnel and other stakeholders operating within the SMS. It would further ensure that those who are delegated the responsibility for safety within operations are appropriately delegated. Fitness for duty outlines the factors that must be assessed before any workplace and individual can be declared fit to perform their duties.

iii. An Operator must ensure that all staff with a responsibility in the SMS are fit for duty to ensure safe, effective, and efficient delivery of its objectives, in all circumstances. The design of safe working conditions and fitness for duty of personnel is crucial for safe railway operations since it minimises the extent to which personnel health and safety are compromised while also optimising organisational output. (Refer to SANS 3000-4).

iv. The Operator must establish, develop, or adopt, document, implement and maintain policies, processes, and procedures to manage employees who, whilst on duty, experience problems that might impact fitness for duty, in accordance with the relevant legislation, regulations, and standards. To balance safe system design and operation, while ensuring the fitness on duty of personnel requires Operators to continually ensure a match between employee capabilities and task, environmental and organisational demands. This must be achieved through identifying, measuring, and managing various factors, including but not limited to the following:

a) Human factors in design
b) Medical conditions – psychological and physical
c) Fatigue
d) Substance abuse
e) Medication
f) Pregnancy
g) Training and development
h) Employee wellness
i) Employee stress

6.2 Management commitment and control (monitoring & review)

i. Management control is a means by which an organisation's resources are directed, monitored, and measured. It aims to help the organisation accomplish its specific areas of safety and its specific targets or objectives. Control on all levels of the organisation, proportionately put over the appropriate delegated functions/staff, allows for the identification of flaws/faults in the SMS processes and therefore the possibility to implement preventive or corrective actions. Therefore, safety must be effectively considered at every level of the organisation, and any instances of malfunctioning must be detected and dealt with in good time.

ii. Management must, therefore, not only ensure safety but also fulfil its commitment and legal obligations to improve railway safety, be aware of the results of performance monitoring and audits and take overall responsibility for the implementation of changes to the risk control measures and relevant SMS processes. The following activities shall be considered by Operators to ensure that management control is implemented in practice:

a) Design, implementation, and monitoring of the delivery of the SMS activities, including the necessary risk assessment and management of changes,

b) Design of the organisational structure, to comply with the regulatory framework and all applicable rules, and allocation of resources,

c) Delegation of responsibilities, functions, and tasks to the appropriate level of the organisation,

d) Delegation of control tasks to the appropriate level of the organisation and development of a feedback loop,

e) Development and monitoring of a safety policy,

f) Development and monitoring of safety measures and projects that allow continuous improvement,

g) Promotion of continuous education and training for all levels of the organisation, to foster employee attitudes, management beliefs and value system,

h) Usage of management tools to address safety issues (i.e., problem-solving tools and techniques),

i) Benchmarking of performance results and processes,

j) Balance between safety requirements and accessible resources,

k) Improvement of managerial and technical processes,

l) Integrating the customers' and suppliers' expectations, and

m) Carrying out internal audits and reviews on a continuous basis.

6.2.1 Decision taking & participation of workers and representatives.

i. Decisions are taken to meet commercial objectives. Investment to meet these objectives may also provide an opportunity to improve safety: new technology and ways of working often bring benefits in terms of performance, efficiency, and safety. Most decisions affect safety, even where this is not the main intention. Therefore, safety should be considered when making decisions and legal obligations must be met. Management decisions must consider the direct and indirect impact thereof on safety. Most major changes are made to meet commercial objectives or requirements that are not primarily about safety. For example,

   a) New technology might become available that can improve an organisation's performance.

   b) Equipment might become life-expired, prompting decisions about how it should be renewed.

   c) Operating conditions might change, presenting an organisation with commercial opportunities.

   d) New legislation, regulations, and standards might be introduced.

   e) Local complaints might draw an organisation's attention to a specific issue.

ii. The need to change can also arise from safety concerns identified during monitoring. In this case, the options might relate directly to the implementation of new safety measures. Processes must be transparent in order to understand how the final decision affecting safety was made. Processes are more effective when they include an understanding of:

a) Identification of safety issues within the business context (such as 'budget reduction' for example),

b) Setting of priorities,

c) Responsibilities at different levels,

d) Methods available to address problems (analysis tools),

e) The value of involving specialists, knowledge, skills, and experience required,

f) Extent of consultation,

g) Output related actions (plans, timescale, and responsibilities for completion).

iii. Therefore, Operators must identify the impact of management activities and decisions on safety and include safety as a key business risk consideration in all decisions across the organisation.

iv. The Operator must, as far as is reasonably practicable, undertake to take a participatory approach before establishing or varying the SMS. The SMS must include auditable systems and procedures to ensure that participation of workers, their representatives and other relevant stakeholders occurs. Participation, or where appropriate, consultation, of relevant stakeholders must be undertaken, as far as is reasonably practicable, with

a) persons who carry out railway operations or work at the Operator's railway premises or with the Operator's rolling stock and who are likely to be affected by the review or variation of the SMS.

b) health and safety representatives within the meaning of occupational health and safety legislation, representing any of these people or organisations.

c) any union representing any of these people.

d) any other Operator with whom the Operator has an interface co-ordination plan relating to risks to safety of railway operations carried out by or on behalf of either of them; and

e) the public, as appropriate.

v. People or organisations that carry out railway operations may include contractors or personnel sourced from external stakeholders. Consultation processes must include reasonable opportunities for persons consulted to make submissions on the SMS and to advise them of the outcome, in a timely manner.

vi. In general, consultation with the public and other relevant external stakeholders would be considered appropriate where the public or external stakeholders may be affected by the establishment, review, or variation of the SMS. This may be where a control requires a particular action or understanding of the public to be effective. For example, it would be appropriate to consult with the public when installing a new door operating device on a passenger carriage.

vii. When undertaking a participatory approach, Operators must ensure that effective consultation and participation:

a) occurs early, before the agenda is set and decisions are made.

b) is planned, genuine and collaborative, within a process that is open and receptive to rail safety worker participation and where the Operator is interested in and values safety critical employees' ideas.

c) is characterised by mutual trust and respect between the Operator and its safety related employees.

d) requires the application of interpersonal, facilitative, and listening skills.

e) includes a proactive role for safety critical employees, who are encouraged to suggest ideas.

f) may require that training in communication skills and risk assessment be provided to enable effective participation by safety critical employees.

g) requires the provision of relevant information.

h) provides opportunities for feedback on issues raised, including opportunities for one-on-one communication where this is reasonably practicable; and

i) results in outcomes that improve the SMS. Within any organisation, involvement of staff is a key element in developing safety culture, gaining staff confidence, and encouraging cooperation, support, and acceptance.

The involvement of staff in the implementation of the SMS is crucial for the development, maintenance, and improvement of a strong safety culture within the organisation.

viii. Employee and their representatives' participation in drafting the organization's safety policy is recommended. A collaborative approach will help ensure that significant employee concerns are addressed in the policy and will provide an additional vehicle for communicating the railway's commitment to safety to employees.

ix. Employees and their representatives must, as far as is reasonably practicable, also participate in setting safety targets and identifying the associated safety initiatives. Employee participation and linking the target-setting process with the risk management process will help to ensure that the most significant safety issues and concerns are addressed. Employees and their representatives can make important contributions to each step of the risk assessment process, which should include mechanisms for employees to identify safety issues and concerns on a routine and ongoing basis. These mechanisms should have a high level of visibility and participation to ensure that all risks are captured. Employees and their representatives must also be involved in the development of hazard and risk control strategies, particularly for hazards and risks that they have identified. Employees must be informed of actions being taken or planned to address the safety issues and concerns they have identified. Feedback is essential to ensure continued participation.

6.2.2 Risk-based safety improvements (safety objectives and targets, monitoring, and improvements)

i. Each Railway Operator, within the framework of its SMS, is expected to demonstrate its capability to achieve their safety targets, which may require maintaining or enhancing its level of safety, in line with the other business objectives. The safety targets are to be considered as part of a continuous loop:

a) they are set based on past performance assessment (that may be the achievement of the previous organisation's safety targets). They should be credible and achievable. Measurement of safety performance (collecting

relevant safety data through routine check arrangements, internal auditing, and safety reporting) is part of monitoring [see section on Monitoring].

b) specific actions are planned and implemented, broken down to be managed at all relevant levels of the organisation [See section on Safety Planning].

c) the actions are monitored, and their effectiveness is measured (again, through routine checks, internal auditing, and safety reporting), focusing not only on the safety outcome but also on the effective performance of safety management activities.

d) safety targets are revised according to the results of monitoring.

ii. The SMS must include systems and procedures to ensure that it is effective by using key performance indicators (Refer to Safety data collection and analysis). Key performance indicators measure the safety performance of both the system and, where appropriate, the individual level, and allow the effectiveness of the SMS to be determined. Once the status of the SMS has been determined, risk based and empirically grounded safety improvements must be developed and implemented (refer to the section on the annual safety improvement plan). In determining performance measures, Operators must consider and select a range of positive performance indicators along with outcome indicators, including leading and lagging indicators.

iii. Positive performance indicators measure activities undertaken to improve safety performance. For example, the number of safety audits conducted, or competence checks undertaken, or the number of substance abuse tests conducted. The performance measures will be tailored to the specific circumstances of the Operator and should be linked to the risk management process. Outcome indicators measure the safety outcomes, for example, the number of non-compliances revealed by a safety audit, or the number of positive results of drug tests, or injuries sustained, or signals passed at danger. An example of a lagging indicator is Lost Time Injury Frequency Rate (LTFIR), which is a measure of the consequence of a risk happening.

iv. Performance indicators selected should include indicators to measure the performance and resilience of key risk controls and SMS elements when exposed to dynamic risks across the system. Key performance indicators should be assessed against established performance objectives. Remedial action may be required where the system does not achieve an appropriate performance level. The SMS must also include systems and procedures to ensure the collection, analysis, assessment, and dissemination of safety information held by the Operator. (Refer to the section on Safety data collection and analysis)

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

7. RISK MANAGEMENT WITHIN OPERATIONS/ PROCESS CONTROL

The management of safety in railway operations is achieved through clearly defined processes that ensure risks are adequately controlled. This involves establishing and applying appropriate standards and procedures, continuously monitoring operations to ensure compliance, and promptly implementing corrective actions to address any identified deficiencies. [see section Corrective Action Development]. Additionally, it includes building sufficient resilience in the system to manage emerging risks safely.

Devising the most appropriate risk management approach starts with an Operator defining its railway operations, developing suitable processes that will enable it to achieve its objectives, and understanding the risks inherent within its systems. Such an approach aims to ensure that railway Operators identify their technical and operational hazards and manage the resultant risks to people, property and the environment to a level that is as low as reasonably practicable (ALARP). The risk management process recognizes that the complexity and nature of the railway operation influences the selection and content of the elements which constitute the SMS. This approach recognizes that, while there is an ideal level of safety, the costs of achieving this ideal might outweigh the benefits and limit the viability of railway operations. It is, however, implicit that railway Operators shall protect their commercial and social responsibilities by running safe railways.

Unmanaged risks within the railway SMS could impact operations and have negative repercussions on the organisation's finances, time, and/or quality. Safety risks can manifest as hazardous events in all three areas, and could also be connected to technical systems, human, and/or organisational factors. The responsibility for the safe operation of the railway system and the control of associated risks belongs to the railway Operators, obliging them to implement necessary control measures and apply relevant legislation, regulations, safety rules and standards. To achieve this, the following must be in place:

a) Processes and procedures for safe, compliant, and effective operations (Operator-specific)

b) Risk management processes and procedures across SMS (identification, risk assessment, controls, monitoring, and review)

c) Information management

d) Continuous improvement processes

Operators must manage all risks within their operations while also complying with the requirements for risk management and risk assessment as prescribed in SANS 3000- 1 (Railway Safety Management) and the Common Safety Method on Risk Assessment (CSM-RA) Guideline (Refer to Annexure B).

7.1 Processes and procedures for safe, compliant, and effective operations (Operator specific)

i. The Operator must establish, develop, or adopt, document, implement, and maintain processes and procedures for safe, compliant, and effective operations across all life cycle phases. Human factors integration processes must also be planned and implemented across all railway operations and throughout the life cycle stages, particularly during concept phases where the greatest impact can be borne in terms of safety, productivity, and quality gains. Processes and procedures for safe, compliant, and effective operations across all life cycle phases must include, but are not limited to, the following:

a) a detailed description of all railway operations that the Operator engages in.

b) a documented set of engineering standards and procedures, and operational systems, safety standards and procedures, to cover all the railway operations and assets (e.g., rail infrastructure, rolling stock and operational systems), and, if relevant, the interface between any two or more railway assets and operations across the entire SMS. Safe working procedures must contain the following, but not limited to:

- a description of the activity.
- identification of the person or position that has a supervisory responsibility for the activity or process.
- organisational working conditions (task, workstation, equipment/ tool, social and physical environmental conditions, etc.) that must be in place/ met for the work to be executed by workers in a safe, compliant, and efficient manner (worker health and safety considerations, minimum crew/ personnel, and resource requirements, etc.)

- communicating the methods used while executing the procedure to all relevant stakeholders.
- a clear explanation in sequential order of the steps or stages comprising the procedure or process; identification of potential hazards in the process.
- identification of safety controls to minimize potential risk from any identified hazards.
- recovery actions should be taken if the risks associated with the hazards be realised.
- mechanisms for reviewing all safe working procedures.
- record keeping requirements.
- document control information.

c) procedures for the Operator to monitor its compliance with the standards and procedures specified in the section about monitoring, including procedures for the inspection and testing of safety-related engineering and operational systems.

d) details of the implementation and updating of these documents as required by the document control arrangements [see Document control arrangements and information management].

e) procedures for the control, verification, and validation of the design of all railway assets (e.g., structures, rolling stock, equipment, and systems) in accordance with the engineering standards and procedures, and operational systems safety standards; and systems, procedures, and standards across the life cycle.

- Verification is the evaluation of an item of railway assets to ensure compliance with specifications and other requirements.
- Validation is confirmation that the requirements for a specific intended use are fulfilled.
- Design control procedures must include, but are not limited to, the following:

- identification of the responsibility for each design or development activity.
- safety risk review at both the design input and design output stages, considering reliability and maintainability.
- assignment of design verification and validation functions.
- control of design changes.

f) procedures for the control, calibration and maintenance of all railway assets used in operations across all life cycle phases.

g) arrangements for the establishment and maintenance of inspection and test records to provide evidence of the condition of railway assets across all lifecycle phases.

- Procedures for inspection and testing of safety related engineering and operational systems must define the location, method, level of detail and frequency of inspection and testing.
- Frequencies of inspection and testing must consider operational criteria, rate of deterioration, consequences of failure, frequency of occurrences and performance data [Reliability, Availability, Maintainability and Safety (RAMS)].
- Inspection and testing must be undertaken according to a set schedule and in response to defined events.
- Records must be created and maintained that provide evidence of the condition of all elements critical to railway safety, in accordance with Document control arrangements and information management.
- Inspection and testing processes must include links to processes for corrective action.

7.1.1 Safe, compliant, and efficient management of risks in railway assets across the life cycle

7.1.1.1 Railway Asset Management across life cycle

i. Asset management involves the systematic and coordinated activities carried out by an Operator to manage key or critical assets. Asset management aims to optimize asset performance while minimizing risks, ensuring effective service delivery, and achieving strategic and regulatory objectives.

ii. Operators must adopt a strategic approach to manage the safe operations of all assets (including, but not limited to rolling stock, signalling) as part of their risk management framework and as documented in their SMS. Under this framework, a risk management approach must be applied in each stage of an asset's life cycle from development of the concept or need, through to and including its design, construction, procurement, commissioning, operation, maintenance, modification, and decommissioning phases.

iii. The intent of this approach to asset management is to minimise the risks related to SMS and asset failure, and to moderate the impact on the surrounding operations both now and into the future. For example, the provision of detailed information on known risks will assist designers in designing out potential problems and provide opportunities to improve safety during the life cycle of the asset.

iv. An effective configuration management system, as part of the SMS, will assist in tracking any changes made to the asset (both functional and physical) during its life cycle. It will also ensure that the correct operating context is considered during design, manufacture, commissioning, operation, modification, decommissioning, and disposal of assets.

v. The asset management policy and processes must provide details of the principles and means through which the Operator will enact the management of its assets, the configuration management requirements for its assets to ensure continuity throughout the various life stages, and the Operator's responsibilities and accountabilities associated with the management of its assets. An Operator must document the assets used to deliver the railway operations (owned or leased), what the asset is expected to do, and under what operating conditions. The asset management processes must use a risk-based approach to understand the relationship of how an asset can fail, what causes the failure, what happens when the failure occurs, what the probability of that failure is, and the immediate and systemic consequences of each failure.

vi. It is a requirement that the SMS includes an asset management policy and processes that address all phases of the asset life cycle of the railway assets. Successful asset management involves the identification of the assets owned or managed by an Operator. In general, the following types of railway assets are identified:

a) Physical assets, e.g., buildings, networks, infrastructure, rolling stock equipment.

b) Human assets, e.g., people skills, career paths, training, reporting, mentoring, and competencies.

c) Financial assets, e.g., cash, investments, liabilities, cash flow, receivables, etc.

d) Intangible assets; intellectual property assets and relationship assets like reputation with customers, suppliers, business units, regulators, competitors, channel partners and brands.

e) Information assets: digitised data, information, and knowledge about customers, process performance, finances, information systems, the protection of the telecom configuration management data, etc. The focus for the railway sector is mainly in the first group, and the physical assets to be considered should be the railway track and related equipment, and trains.

vii. Asset management also refers to the policies, strategies, information, plans, and resources, which integrate to deliver efficient operation, and put in place of the above-mentioned activities and practices 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; however, the management of assets can also plan for safety hazards brought into the organisation during asset renewal and disposal.

viii. Asset management can therefore support the procedures to ensure compliance throughout the lifecycle of equipment. Operators must submit a comprehensive updated rail asset register and maintenance data in the form and format as prescribed by the RSR from time to time. (Refer to the RSR requirements as per the NIMS Asset Management Module). Operators must also submit regular asset performance data to the RSR as it relates to reliability, availability, maintainability, and safety (RAMS data) of such assets.

7.1.1.2 Compliance with legislation, rules, and standards

i. Compliance with railway legislation, rules and standards is a mandatory requirement for the management of railway safety. Operators 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 throughout the entire life cycle of railway assets and operations. The regulatory framework may include different documents such as standards and other relevant rules, applicable at the national level. Therefore, it is crucial that all railway operations and safety related procedures and processes of the SMS are:

a) designed to comply with the regulatory framework and updated to take into account any variation or addition.

b) consistent with the type and extent of services operated by the organisation.

c) consistent with relevant organisation changes.

ii. As a minimum, the Railway Safety Regulator (RSR) expects:

- Systems and procedures for regulatory changes to be identified, actioned and tracked, which outline:
  - Who is accountable in the organisation for these actions?
  - How will legislative changes be actioned and communicated internally?
- An agenda item to discuss the level of regulatory compliance in governance meetings for the SMS review.
- Systems and procedures for identification and compliance with safety requirements under the Railway Safety Act, 2024 (Act No.30 of 2024)
- Systems and procedures to ensure regulatory compliance is considered as part of risk management processes.
- Systems and procedures for implementing safety requirements.
- Systems and procedures for monitoring of the Railway Safety Act, 2024 (Act No.30 of 2024) and statutory notices (such as improvement or prohibition directives) to ensure compliance is being achieved.

iii. Therefore, it is crucial that all railway operations and safety related procedures and processes of the SMS are:

a) designed to comply with the regulatory framework and updated to take into account any variation or addition.

b) consistent with the type and extent of services operated by the organisation.

c) consistent with relevant organisation changes.

iv. To ensure compliance, the SMS must have a process/procedure in place to promptly identify, gather, and list relevant requirements contained in standards, safety and technical rules and internal rules/procedures, for example, but not limited to:

a) Each individual category of staff.

b) All railway assets across the life cycle.

c) Safety equipment (personal protection equipment – PPE - and collective protection equipment - CPE).

d) Other equipment (e.g., on board, on the ground, devices used for rolling stock and track maintenance).

v. Variations/additions in this regulatory framework must be promptly detected and recognised.

vi. While compliance is critical, Operators must implement processes and procedures that will assist them in continuously improving the management of safety risks and the system's maturity in proactively anticipating and addressing system deficiencies over time.

7.1.1.3 Risk management processes and procedures across SMS

i. Risk management is a critical activity of any organisation, and the SMS must support the management of risk, as far as is reasonably practical, to ensure that risks are identified, assessed, eliminated, or controlled and controls are monitored and reviewed to ensure their effectiveness. The main objectives of risk assessment within the SMS are to support professional judgements about safety and must fulfil the following:

a) Meet the requirements of health & safety legislation, regulations, and standards.

b) Help ensure that the Operator’s managers and staff identify and understand all aspects of the risk associated with their operation (the potential hazardous events, causes, control measures and consequences that can influence their operation),

c) Provide verifiable assurance that a system can be operated safely, given the equipment, facilities, SMS, and operating strategy in place,

d) Identify, understand, and control the interfaces with other companies and related operations that can affect the safe operation of a system,

e) Assist in the identification of new control measures that could be used to reduce risk,

f) Help direct the development of an Operator's safety plans and associated safety objectives,

g) Assess the change in known and emergent risks which could result from a change in the operating strategy or following alterations/renewal of any part of the system,

h) Enable resources to be directed effectively to achieve the maximum risk reduction,

i) Help determine the requirements and areas requiring safety audit and other monitoring measures,

j) Enable an Operator to demonstrate that the level of risk associated with its operation is controlled to a level that is ALARP,

k) Provide a basis for continuous safety review and improvement,

l) Provide input into the development of wider industry controls and standards.

ii. The management of risks should permeate all levels of the SMS spanning across the life cycle of the railway Operator's system, including concept, design, execution, testing and commissioning, operation, monitoring and maintenance, modification, and decommissioning and disposal.

iii. An Operator's SMS must therefore include risk management processes and procedures for the following:

a) identification of any risks to safety in relation to railway operations which the Operator is required to be accredited.

b) the comprehensive and systematic assessment of any identified risk.

c) specification of the controls (including audits, expertise, resources, and staff) that are to be used by the Operator to manage the identified risks to safety, worker health and to monitor safety in relation to those railway operations; and

d) monitoring, reviewing, and revising the adequacy of controls.

iv. Risk assessments shall be reviewed at least annually or after a major railway occurrence or security incident, or when the safety performance has not improved, or on receipt of a directive from the Railway Safety Regulator.

v. Types of Hazards and Risk Assessment:

Hazards and risk assessments can be of a qualitative or quantitative nature. 'Qualitative' refers to descriptive analysis and judgements about risk-related factors. 'Quantitative' refers to numerical estimates and analysis of risk. In practice, most analyses are based on elements of both. The two categories of analysis have the following common characteristics –

a) The effort and rigour of analysis are proportionate to the complexity and importance of the decision.

b) The skills and competence used are relevant to support each judgement in the process.

c) A person or group is identified as responsible for the assessment, taking account of all relevant judgement and analysis, and structured processes are used where appropriate.

d) The evidence on which the assessment was based, and the reasoning used to interpret that evidence, are recorded. The records will again reflect the complexity and scale of the decision (ranging, for example, from meeting minutes to a full formal analysis and report)

e) A degree of independent review or challenge may be necessary.

vi. Documenting the hazard and risk assessment:

To enable a better understanding of the basis of the risk assessment and to make the assessment more meaningful, it is essential that the origin and derivation of the data behind each frequency and consequence estimate, and all the assumptions made for the purposes of the risk assessment, are justified and recorded within the risk assessment documentation. The records should include:

a) The risk assessment methodology used.

b) The sources of data/information used (including staff/experts involved in any workshops) and any key assumptions.

c) Any judgments made during workshop sessions. For cases where modified national data have been used, an explanation of why it is believed the data is applicable should be given. Where possible, factors specific to the operation being considered which might increase or decrease the data with respect to the national average should be referred to, e.g., average passenger loadings, type of rolling stock and train speeds.

d) The results of the risk assessment for the most significant hazardous events (e.g., top 10) and identify where the arrangements for implementing the existing controls are in the SMS.

e) Summarise the results of the ALARP assessment; and

f) Identify any areas where there is a high level of uncertainty.

vii. This information would assist:

a) In demonstrating compliance with legal requirements

b) A reviewer in understanding the background to the risk assessment.

c) In demonstrating that the risk assessment is robust.

d) Anybody needing to change or update the risk assessment to understand where the assumptions, data and results have come from.

7.1.1.4 Transportation of Dangerous Goods

i. While the risk management requirements are applicable to all Operators, those that handle and transport dangerous goods within their railway operations must fulfil additional requirements to preserve the safety of their operations and internal and external stakeholders who may be affected by the risks related to the handling of dangerous goods. Requirements for the management of dangerous goods-related risks apply to all railway Operators that handle and transport dangerous goods, with the following exemptions:

a) Dangerous goods carried by a passenger intended for domestic use, or leisure or sporting activities.

b) Gases and liquids in tanks affixed to vehicles intended for use in its operation.

c) Exempt quantities as listed in SANS 10231

ii. Operators must develop appropriate processes and procedures to manage risks within their scope of operations as well as risks that may arise from their interactions with other stakeholders. Some of the requirements that need to be considered for Operators that handle dangerous goods include the design of vehicles under pressure and non-pressurized tank wagons and general freight wagons. Security requirements when handling dangerous goods include:

a) appropriate training of personnel, including, where appropriate, consignor and consignee personnel, and

b) development of security plans for the transportation of dangerous goods.

iii. As a minimum, the responsibilities that consignors, Train Operators, and consignees are provided in the table below.

Responsibilities of consignor	Responsibilities of the Train Operator	Responsibilities of the consignee
• Classification and packaging. • Requirements for loading. • Waste classification confirmation. • Precautions with respect to food products for human consumption and animal feeds. • Loading of gas cylinders; documentation, including	• Confirmation of the suitability and service worthiness of the rolling stock or containers (or both). • Accuracy of documentation for the dangerous goods to be conveyed. • Shunting and marshalling of rolling stock, including compatibility requirements and the correctness of the train consist. • In-transit monitoring of the rolling stock containers, and the integrity of the dangerous goods load.	• Offloading of dangerous goods by competent and resourced personnel • Verification that the consignment was not damaged or spilled. Where there is evidence of damage or spillage to engage the relevant competent authorities on appropriate actions. • Certifying the state of cleanliness of empty wagons or containers (or both).

Responsibilities of consignor	Responsibilities of the Train Operator	Responsibilities of the consignee
consignment note and wagon label. ● Placarding; ● Management of the relevant railway occurrences, and ● Sharing of hazard information to internal and external stakeholders involved.	● An appropriate contingency plan; and railway occurrence management. ● External communication strategy available: o Regular simulation exercises o Regular meetings o Contact details available	● Handling of bulk deliveries appropriately; and ● Management of the relevant railway occurrences. ● Information sharing with the relevant stakeholders.

Additional requirements for the management of dangerous goods are reflected in this sub-clause is amplified in SANS 10405.

7.1.1.5 Security Management

i. Operators must include in their SMS procedures, processes and systems aimed at the management of security as described in the Railway Safety and Security Regulations of 2022 and other relevant legislation. The SMS must include:

a) An approved Security Policy which addresses:

- Security risk assessment within the railway operations
- Security management
- The development and implementation of a security management plan
- Monitoring of compliance with the security management plan
- The operator's audits and inspections
- Review of the security policy
- Communication, education, and awareness

b) An appointed Security Compliance Officer responsible for ensuring an operator's compliance with the requirements of the Railway Safety and Security Regulations of 2022.

c) A security management plan that includes measures to protect people from theft, assault, sabotage, terrorism, and other criminal acts of other parties and from other harm.

d) A Safety of Persons Compliance Plan to ensure the safety of persons within the railway operational environment, including passenger safety and the safety of persons with special needs.

e) An appointed Safety of Persons officer.

f) Systems and procedures to protect and safe-guard safety critical railway assets and mitigate risks of theft, sabotage, malicious damage of property (vandalism), and other criminal acts.

g) Notifying, recording, and reporting security incidents to the RSR and other relevant authorities.

h) systems and procedures to ensure that the appropriate response measures of the security plan are implemented without delay if such a security incident occurs.

ii. The security management plan must include all the following:

a) A list of the risks arising from theft, vandalism, assault, sabotage, terrorism, and other criminal acts or other sources of harm.

b) A description of the preventative and response measures to be used to manage those risks, including a description of the policies, procedures and equipment, and other physical resources that it is proposed to use for those measures, and of the training that it is proposed to be provided.

c) If the Operator shares a location, such as a modal interchange or a port, with one or more Operators, a description of the arrangements made with those other Operators in relation to that location to prevent or respond to security incidents.

d) Procedures for the recording, reporting, and analysis of security incidents.

e) The allocation of security roles and responsibilities to appropriate people.

f) Provision for liaison, the sharing of information and for joint operations with emergency services and with other Operators who may be affected by the implementation of the plan.

g) Provision for the evaluation, testing, and if necessary, the revision of security measures and procedures.

7.1.2 Management of contractors and suppliers involved in design, procurement, operation, and maintenance of operations.

i. Where suppliers, partners, contractors, and subcontractors are relied upon to undertake activities relating to safe railway operations, the railway Operator must control the delivery and integration of safety related supplies and services provided by these suppliers, partners, contractors, and subcontractors within the Operator's SMS. This means that:

a) Criteria for the selection and accreditation of service providers/contractors shall be established.

b) Suppliers, partners, and contractors must satisfy the same requirements that the Operator is required to meet: the corresponding contracts shall cover all the relevant requirements, including at least: responsibilities and tasks relating to railway safety issues, the obligations related to the transfer of relevant information between both partners and the traceability of safety related documents.

c) The Operator must ensure, through appropriate monitoring, that the supplies and services offered consistently meet safety requirements; the Operator must ensure that the checks, inspections, and audits called for by the relevant legislation, regulations, standards, and the Operator's SMS risk management requirements are conducted.

d) The Operator must ensure that preventive or corrective measures are implemented after monitoring and evaluation processes are completed (i.e., after checks, inspections, and audits). It is equally important that suppliers and/or contractors have a clear understanding of the railway risks they are

under as well as the risks they import to the Operator's railway operations and the entire SMS.

ii. When there is a requirement to procure railway assets, the Operator shall establish and maintain procedures for ensuring that procurement of assets (e.g., goods, services, and products) complies with specified railway safety requirements. The Operator shall establish and maintain procedures to ensure that:

a) Procurement documents contain adequately specified railway safety requirements.

b) Tender or proposal invitation documents are reviewed by the Operator to ensure that railway safety requirements are adequately defined and documented. Any conflict between the specified railway safety requirements and those contained in a tender or proposal shall be resolved before a contract is awarded.

c) The selection of contractors and subcontractors take into account their capability to comply with railway safety requirements and that steps are taken to verify that the supplied goods or services, including those supplied from within the organisation, comply with railway safety requirements before they are accepted.

d) Procedures for the selection, control and ongoing review of contractors and subcontractors for safety related work, including the coordination of these activities across all parts of the organisation, are established and maintained.

e) The type and extent of control exercised is dependent upon the type of service and, where appropriate, on the records of contractors' and subcontractors' previously demonstrated capabilities and safety performance.

f) The capability of a likely contractor or supplier to comply with the specified safety requirements is reviewed before a contract is awarded and safety requirements are adequately incorporated into contracts.

g) Where appropriate or specified, traceability of manufacture through batch or other identification is available.

h) Permission for the engagement of a subcontractor by the contractor, both initially and during the course of a contract, shall be subject to a review of the capability of the proposed subcontractor to comply with the specified railway safety requirements.

7.1.3 Interoperability and management of interfaces (interface and intraface management)

i. An interface agreement is a written agreement for managing risks in relation to interfaces between Operators. As a minimum, an interface agreement must include provisions for:

a) Implementing and maintaining control measures that are to be used to manage safety risks associated with the interface, and providing for the evaluation, testing and, if necessary, revision of those control measures.

b) The respective roles and responsibilities of each party to the agreement in relation to each control measure.

c) the procedures by which each party will monitor and determine whether the other party complies with its obligations under the agreement.

d) The exchange of information between the parties in relation to their obligations under the agreement.

e) The triggers for, and the frequency of, reviews of the agreement, and if necessary, the revision of the agreement.

ii. The Interface Agreement Standard (RSR 00-2-6-1) describes the minimum requirements for interface or intraface management (or both) to be met by Network, Train, and Station Operators to accomplish the required levels of safety and performance for those operations throughout their lifecycle, and the removal of technical barriers to the supply of equipment. Operators must include in their SMS procedures, processes and systems aimed at the management of interoperability, interface and intraface management as described in the Interface Agreement Standard and other relevant legislation.

iii. Documented procedures and processes must be established, developed, or adopted, implemented, and maintained to ensure the safe interoperability of railway operations and for the management of safety at interfaces between Operators and intraface between functional disciplines within an Operator's organisation.

iv. The purpose of the interface coordination provisions is to ensure Operators identify risks to safety arising from each other's railway operations. The SMS must include procedures for:

a) The identification of interface risks to the safety of railway operations.

b) The development and implementation of interface agreements to manage the interface risks identified.

c) Monitoring the implementation and effectiveness of and compliance with interface agreements.

v. Operators are required to keep a register of their interface agreements and ensure that they are regularly reviewed in light of new risks, changes made to standard working and operating procedures.

7.1.3.1 The coordination tasks for the Network Operator within the SMS

i. The SMS of a Network Operator is more affected by the number, type, and range of Train Operators using its network than that of a Train Operator. As interactions between railway partners increase, the SMS of a Network Operator should reflect the appropriate and updated level of complexity of services it provides.

ii. Some examples of infrastructure-related and operations-related activities that should be considered as interfaces to be managed by the Network Operator are listed below:

a) Infrastructure-related

- infrastructure maintenance (e.g., tracks, signalling, telecommunications, overhead lines), ensuring that train movement and maintenance activities can be performed without endangering passengers, workers, third persons and assets (either carried out internally or outsourced).

- protection from other transport modes' interfaces (crossings, bridges, sidings).
- safety of tunnels.
- safety of persons working (e.g., track, signalling, telecommunications, or overhead lines maintenance) on or adjacent to railway premises (for construction sites or other reasons).
- communication of infrastructure-related information that may affect traffic: requirements, permanent/temporary restrictions, adoption of degraded mode and/or abnormal working procedures, alerts, etc.)

b) Operations related.

- train movement control or authorisation, in normal and degraded situation for all Operators operating on the controlled infrastructure.
- interface with neighbouring Network Operators (to ensure continuity of service at the national and international level).
- access to marshalling yards, freight terminals, and private sidings.
- shunting (operating directly or supervising undertakings operating on the controlled infrastructure); exchange of operational information with other Operators in case of rolling stock failures that may have an impact on the scheduled operation.
- Control of activities in the passenger stations, including the control of passengers and public access, specific provision for persons with reduced mobility and availability, ventilation, lighting, and conditions of platforms. These issues are limited to areas that are functional to the core railway-related activities as, for instance, access to the track area, platforms for entraining and detraining (i.e., boarding and getting off trains).

c) Emergency-related (also refer to 7.1.5 Emergency response and contingency planning and preparedness)

- Protection of passengers in case of an accident.

- Legal issues on the management of the occurrence site where there is a fatality.
- Exchange of information with all interested and affected parties in case of emergencies and service disruptions.
- Implementation of relevant contingency procedures
- Clearance of the affected tracks after accidents or disruptions
- Implement business continuity procedures.

7.1.4 Occurrence management (recording, reporting, and investigation of occurrences)

i. The Operator's SMS must include systems and procedures for:

a) The reporting of notifiable occurrences to the RSR, within the time and manner required in the legislation, regulations, and standards, including all the information required by the RSR as per the Regulations On Notifiable Railway Occurrences, also called RONO).

b) The management of the scene of a notifiable occurrence and for the preservation of evidence where reasonably practicable; and

c) The management of the scene where there is a fatality occurrence and for the preservation of evidence where reasonably practicable, and

d) The management of all notifiable occurrences, including procedures to enable the determination of notifiable occurrences to be investigated and how investigations are to be conducted.

ii. Supporting systems and procedures to ensure staff are appropriately trained and competent to deal with a notifiable occurrence are fundamental.

iii. The management of notifiable occurrences is also closely related to emergency management planning, which may be triggered for an emergency which is also a notifiable occurrence. For this reason, the two processes should be aligned. For instance, the procedures for the management of personnel at the scene of an incident in an emergency situation and responsibilities for notifying the RSR may overlap.

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

iv. Reporting of notifiable occurrences

a) The reporting of occurrences to the RSR is a legal requirement in terms of Section 49 of the Act. The relevant section of The Act states that "an operator must report a railway occurrence to the Regulator in the time, manner and form prescribed by the Minister."

b) Non-reporting of occurrences to the Regulator, late reporting or underreporting of railway occurrences is an offence in terms of The Act, which may lead to a fine and/or revocation of the Safety Permit.

c) Notifiable occurrences that happen on, or in relation to the Operator's railway premises or railway operations, must be reported by the Operator to the RSR in the form, format and within the specified timeframes as prescribed by Regulations On Notifiable Railway Occurrences (RONO). Notifiable occurrences that are reportable to the RSR can be related to:

- Operational railway occurrences;
- Security-related railway incidents;
- Railway occurrences related to the transportation of dangerous goods;
- Crowd related railway occurrences, and Industrial action related railway occurrences.

v. Investigation of notifiable occurrences

a) The management of notifiable occurrences is a legal requirement in terms of the Act, and the Regulations On Notifiable Railway Occurrences; and is further amplified in the Occurrence Management Standard (RSR 00-3).

b) Operators must ensure that they have in place procedures for investigating railway occurrences with the primary objective of establishing the root cause(s) to prevent a recurrence. The scope and level of investigation shall be determined by the frequency of the railway occurrence and the severity or consequences (or both), both actual and potential.

c) The focus of such investigations should be to determine the root cause(s) and contributing factors, rather than to apportion blame.

d) Persons appointed to investigate occurrences shall have the necessary competence and independence where feasible, both in relation to the nature and seriousness of the occurrence, and the scope and level of the investigation. The SMS must identify matters for investigation more broadly than simply responding to any instruction from the RSR to conduct an investigation of that occurrence or type of occurrence. Requirements for systems and procedures for the management of the scene of a notifiable occurrence and the preservation of evidence are provided by the "Occurrence Management" section.

7.1.5 Emergency response and contingency planning and preparedness

i. Each railway Operator must set up an emergency/contingency plan identifying and specifying the different types and levels (critical, non-critical, etc.) of emergencies that might occur on the railway network. Occurrence Management Standard (RSR 00-3) and other relevant legislation.

ii. The plan must be based on risk assessments to prevent and mitigate the consequences of all potential occurrences associated with railway operations. Each plan must be periodically reviewed (at least annually) and detail the actions, alerts, and information to be given in case of an emergency. All foreseeable emergencies need to be identified, and for each emergency situation, the plan must clearly identify and define:

a) The different parties/staff interested/involved (including periodic participation of management).

b) The interfaces between Operators and relevant public authorities.

c) The references for emergency-related activities and actions.

d) Processes and procedures are to be set in place according to the type of emergency.

iii. Regular testing of emergency plans, as far as reasonably practicable, should be carried out, including joint exercises with relevant parties, to assess and update the plans' effectiveness. Emergency procedures must be agreed upon with appropriate organisations, and they should be adequate and anticipate different operational scenarios that may occur in a disruption, also involving the

CONTINUES ON PAGE 130 OF BOOK 2

Printed by and obtainable from the Government Printer, Bosman Street, Private Bag X85, Pretoria, 0001
Contact Centre Tel: 012-748 6200. eMail: info.egazette@gpw.gov.za
Publications: Tel: (012) 748 6053, 748 6061, 748 6065

Government Gazette
Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID AFRIKA

Vol. 723 19 September / September 2025 No. 53360

PART 2 OF 2

ISSN 1682-5845

9 771682 584003 53360

intervention of public authorities, emergency, and rescue services. In instances where written agreements are not reasonably practicable, Operators must provide evidence of controls to manage risks related to this gap.

iv. Scenarios should consider a variety of specific situations, for example:

a) Language issues that may arise in case of events involving foreign language speaking drivers and on-board staff.

b) Transport of dangerous goods (specific knowledge of substance labelling and flow of information to relevant organisations in conformity with relevant regulations concerning the carriage of dangerous goods by rail provisions and with national applicable rules).

c) All internal and external organisations are to be informed about emergency management and recovery.

d) Involvement of all parties concerned in the testing phases.

v. The emergency preparedness plan must address, specifically, as a minimum, the following:

a) Initial response procedures.

b) Call-out procedures, including reporting of the occurrence to the RSR and other relevant authorities.

c) On-site management of an occurrence.

d) Liaison with emergency responders.

e) Evacuation procedures.

f) Initiation of an investigation.

g) Environmental response and rehabilitation.

h) Service restoration to normal operations.

7.2 Information Management

i. The implementation of SMSs involves managing data, facts, and knowledge about the organisation's performance. Further involves identifying deviations in processes or outcomes and assessing how the organisation and its various elements respond to internal and external changes. When applied through effective feedback and feedforward mechanisms, information can become useful knowledge that can inform the management of risks within SMSs and can be the foundation for more effective and innovative management of operations and safety. Since information can emanate from various sources, exist in various formats, and can be distributed through multiple channels, railway Operators must be able to collect, store/ archive, analyse, and disseminate the information appropriately.

ii. The SMS must have systems and procedures to control and manage all documents and information relevant to the management of risks to safety associated with railway operations. Such systems and procedures must include systems and procedures for:

   a) the identification, creation, maintenance, management, storage and retention of records and documents.

   b) ensuring the currency of documents required for railway operations; and

   c) the communication of any changes to the document control systems and procedures, to safety critical employees and employees of the rail Operator who rely on those systems and procedures to carry out their work.

iii. As a general principle, organisations must ensure that key operational information is:

   a) Relevant and valid.

   b) Accurate.

   c) Complete.

   d) Appropriately updated.

   e) Controlled.

   f) Consistent and easy to understand (incl. the language used).

g) Staff are aware of its existence before it must be applied.

h) Easily accessible to staff and where required copies are formally given to them.

7.2.1 Requirements on the structure of the SMS report

i. The SMS must be documented in all relevant parts in a SMS report (SMSR). The Operator shall submit the documented SMS report to the RSR in order to demonstrate the ability to manage railway operations safely. The SMSR shall describe and provide evidence of the following:

a) Operator's organisational and procedural arrangements through which it will ensure the safety of railway operations and further activities which are still to be carried out to ensure the ongoing safety of operations.

b) It shall also describe the distribution of responsibilities within the organisation of the railway Operator and should demonstrate 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 SMS is ensured.

c) Evidence that the Operator has the ability, commitment, organisation, and resources to properly assess and effectively control the risks to assets, environment, health and safety of its customers, staff, contractors, visitors, and others who may be affected by its railway operations.

d) A comprehensive working document against which both the Operator and the RSR can check that the accepted risk control measures and SMS have been put properly into place and continue to operate as intended.

e) Visibility of the processes being applied to demonstrate that the Operator's arrangements for ensuring safety are effective and sufficiently robust.

ii. The importance of the Operator's description of the railway system is key to the adjudication of the adequacy of the SMS. The description should explain the framework for implementation of the SMS as contained in the SMS Report requirements. The system's description can be used to:

a) Provide contextual information on the organisation to which the SMS applies, including organisational charts.

b) Specify the scope and nature of the railway operations to which the SMS applies.

c) State the persons responsible for implementing the SMS and the relationship between these persons.

iii. The SMS and SMS Report must be in a form that is consistent with the scope of the SMS as described in this Determination. It must:

a) Be evidenced in writing.

b) Provide a comprehensive and integrated management system for all aspects of control measures adopted in accordance with the relevant legislation, regulations, and standards.

c) Be set out and expressed in a way that its contents are readily accessible and comprehensible to persons who use it.

d) Be prepared in accordance with this determination.

e) Contain the matters and information required by the Standards, Regulations, and this determination.

f) Be kept and maintained in accordance with the Standards and this instruction determination.

g) State the persons responsible for the development and implementation of all, or all parts of, the SMS.

h) The format and content must comply to the SMS Determination.

7.2.1.1 The structure and content of an SMS report

i. Railway Operators must develop and implement their SMS in accordance with the requirements set out in this Determination. For each of the elements, and as part of demonstrating their SMS through the SMS Report, Operators must detail and give supporting information and evidence of the different processes or organisational standards/rules implemented (or in the phase of implementation), cross referencing or linked to the items identified. The main elements of the railway Operator's SMS, and thus the structure and content of the SMS Report are as follows:

a) Business overview

b) Overview of SMS implementation evidenced through the SPCAM.

- Safety policy (applicable to the entire SMS and founded on a systems approach where human factors considerations and safety culture permeate the entire SMS)
- Leadership, management, and organisational structure.
- Risk management within railway operations.

7.2.1.2 General/ Business Overview

i. The following information shall be documented in the general/ business overview section of the SMS Report:

a) A systems description (business overview):

- The name, physical and postal address, and company registration number, including the name, physical and postal addresses, and contact details of the Nominated Manager.
- A statement of strategic intent, nature of the business (freight, passenger, heritage, etc.), vision and mission statement, business philosophy, envisaged market growth, including new works during the period of issuance of the new Safety Permit.
- Geographical areas of business (description including relevant maps, figures, and diagrams),
- Annual volume of passengers and tonnage transported, number of yards, sidings, and types of rolling stock and locomotives.
- Organogram, number of employees.
- Description of train operations (including signal and telecommunication systems in use), depot operations and station operations.
- Maintenance strategy: broad maintenance strategy; maintenance plan, person in charge for delivery of maintenance arrangements; shared maintenance responsibility, management of contractors, introduction of new technology, asset configuration process.
- A summary of the key aspects of the elements of the Operator's SMS as

required by the SANS 3000 series of standards.

- A list of the applicable titles and dates of relevant safety related legislation, Regulations, and standards that are applicable to the Operator's railway operations.
- A list of all the applicable SMS Standards.
- A list of all the applicable SMS procedures.
- A list of all the safety critical and safety related positions.
- A list of the training courses required for each employee who does safety related work.
- A list of interface agreements with other Operators with whom the applicant interfaces.
- Annual Safety Improvement Plan (Refer to 7.2.1.3).

ii. Additional Information by the Network Operator:

The Network Operator shall supply the following information

a) A description of the network, with the following suitable diagrams attached:

- A diagram of the infrastructure (e.g., track gauge, bridges and tunnels, servitudes, and wayleaves (where applicable), train control systems and related telecommunication methods, and electric traction infrastructure; and
- A diagram of the geographical areas of operation, including
  - The train service border areas.
  - The network borders.
  - The sections of lines with route kilometres and single-track kilometres.
  - The location and type of level crossings (vehicle crossings and pedestrian crossings).
  - The total number of private sidings, and the number (s) of sidings in use.

b) Operational descriptions, for example, train control systems (such as colour-light signalling; radio-based train control systems).

c) Operational parameters per route.

- Maximum allowable speed.
- Maximum axle loading.
- Maximum train length, in metres, including the motive power.
- Route restrictions other than normal operational parameters (for example, the loading profiles, motive requirements, or infrastructure limitations when specialized freight such as abnormal loads or dangerous goods are to be conveyed).
- Capacity utilization of each route.
- Motive power (steam, electric, diesel, other).
- Maintenance plan and list of maintenance depots and maintenance equipment in use.
- List of power supply substations.
- Other (specify).

iii. Additional Information by the Train Operator:

The Train Operator shall supply the following information:

a) Information about the rolling stock, i.e.

- The motive power, whether
  - Electric (type and number of locomotives),
  - Diesel (type and number of locomotives),
  - Steam (type and number of locomotives),
  - Others (specify)
- Wagons (type and number)
- Passenger coaches (type and number)
- Information on the maintenance depots and maintenance facilities.

- Other (specify)

b) The network routes used by the Train Operator and the frequency and nature of the operation.

c) The stations that will be used and the frequency of use.

d) Dangerous goods handled, i.e.

- Projected volumes.
- Routes.
- Classes.

e) Other (Specify)

iv. Additional Information by the Station Operator:

The Station Operator shall supply the following information:

a) A list of the stations under his control, the routes, and the name of the Network Operator responsible for each station.

b) A list of the names of Train Operators and the stations they use.

c) The capacity of stations in terms of trains and passengers.

d) The average utilisation of stations in terms of trains and passengers.

e) Other (Specify).

7.2.1.3 Annual Safety Improvement Plan

i. The Annual Safety Improvement Plan (ASIP) which shall be submitted annually shall support the Operator's safety policy, demonstrating commitment to continual safety improvement. The safety performance report and annual safety improvement plan must be signed by the head of the Operator's organisation or his/her delegated representative and communicated to all the employees.

ii. The ASIP must be based on a five (5) year rolling cycle of safety targets and objectives to be achieved, and which will be measured on an annual basis.

iii. Operators are required to document their ASIPs in such a manner that the first part of the document addresses the safety performance of the previous cycle of their Safety Permit and the second part of the document addresses the ASIP of the new cycle of the Safety Permit. Operators that are new in the industry and have not had any operations must submit an ASIP that outlines the processes that will be implemented to ensure continual safety improvement across the SMS.

iv. The annual safety improvement plan (ASIP) includes:

a) A description and assessment of the safety performance of the Operator's railway operations.

b) Comment on any deficiencies, malfunctions, and any irregularities in the railway operations, infrastructure, management that may be relevant to the safety of the railway, and that might be relevant for the safety authority.

c) A description of any safety initiatives in relation to the railway operations undertaken during the reporting period or proposed to be undertaken in the next reporting period.

d) Results of the most recent (not older one (1) year except but not older than six (6) months where material changes have occurred) risk assessment undertaken and the resultant risk control strategies.

e) The most recent results of internal auditing of SMS requirements providing insights into deficiencies in implementing the requirements.

f) Periodic analysis by the Operator of occurrence data to identify safety trends and to provide feedback to the risk management process.

g) Results of trend analysis using historical data of railway occurrences reportable to the RSR (where relevant, trends of other occurrences deemed by the Operator to be important should also be included) and the associated root causes and contributory factors.

h) Periodic review of the safety data analysis by Senior management.

i) The development of safety indicators (both leading and lagging indicators) as far as it is relevant to the reporting organisation.

j) Information on how the Operator 's safety targets are met and the results of safety plans.

k) Based on the findings above, a list of the most critical railway safety issues to be addressed for the next year and beyond.

l) Where appropriate, annual safety performance targets must be set for each discipline or department of the Operator. The safety targets must be measurable, meaningful, and realistically achievable while considering the current realities. These targets shall:

- Promote continual improvement.
- Be tailored to the needs of the Operator.
- Be linked to the Operator's risk management process.

m) Deviations from the original planned asset maintenance interventions.

n) Any other information or performance indications prescribed in the regulations.

v. It is important to note that:

a) "Organisation's safety targets" may tend to improve or maintain safety performance, resulting from the analysis of past performances.

b) "Safety plans" are documents containing a list of actions with expected results, relevant timeframe and allocation of responsibilities, identified to pursue improvement in performance or maintaining an adequate level of safety.

7.2.2 Document management & configuration control/ Storing information.

i. Measures to control vital safety information 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. Operators must define information control procedures based on existing management systems. Safety information must be readily available for consultation and/or verification.

ii. Processes and procedures describing activities, having direct and indirect effects on railway safety, are relevant parts of the SMS, both at an organisational and operational level and should be duly documented to ensure traceability and stored in a manner that can facilitate access when required.

iii. SMS documents must be promptly and accordingly updated in case of relevant technical, operational, and organisational changes, even if they do not seem to affect operational safety directly. The documentation needs to ensure the traceability of SMS processes. Up-to-date and consolidated documentation describing the characteristics and elements of the SMS must exist. This includes, but is not limited to, a formal document on the Railway Operator's SMS that must be submitted by Operators applying for a Safety Permit.

iv. There are several types of information to be managed, with different degrees of criticality for operation. This includes, but is not limited to:

a) Procedures applicable at the organisation-wide and local level.

b) Operational urgent information concerning train movements, like late notices, temporary speed restriction(s), dangerous goods, hauled load, etc.

c) Operational safety information/documentation, like a braking sheet, train schedule, etc.

d) Operational permanent information documentation like rules books or route books, permanent safety orders, etc.

e) More general SMS information (feedback of experience, staff involvement, minutes of meetings, safety plans/reports, audit and monitoring results documents related to implementation of corrective/preventive actions, etc.).

v. While the elaboration, transmission, storing/ archiving requirements, and processes may be different for the different types of information managed by the Railway Operator, an appropriate method to format and generate controlled documents must be developed and implemented. As a minimum, the configuration control system must provide appropriate fields at least for:

a) Unique identification number.

b) Date.

c) Responsible person for preparation.

d) Responsible person for authorising the release (of the original document and of the following revisions).

e) List of revisions.

7.2.3 Communication (internal and external)

i. Organisations cannot operate without appropriate communication, which is necessary to support operations. Communication processes that are in place within the organisation support and enable the SMS to function effectively. Communication can take various forms, but all forms involve the transfer of information from one party to another. The exchange of relevant safety information is crucial within (internal communication) and among organisations and stakeholders (external communication). The necessary flow(s) of internal and external information must be identified and acted upon. It is therefore important that defined reporting channels and interfaces exist, within a structured process, to ensure that knowledge and understanding of the SMS is ensured and all safety-relevant information is conveyed to or available for the right person/role/function in a prompt and clear way. This is particularly critical where the exchange of information pertains to known hazards and risks that need to be controlled by others. Good two-way communication is also essential because it supports the dissemination of information to enable the appropriate actions to be taken, while also contributing to the development of a positive safety culture.

ii. Internal communication refers to the distribution of information among stakeholders at all levels within an organisation (e.g., staff involved in SMS design, implementation and delivery, staff involved in operational and organisational arrangements and changes, operational staff). External communication refers to the exchange of information with stakeholders that exist beyond the borders of the organisation. Some of the external stakeholders that Operator may need to communicate with include, but are not limited to:

a) Service providers operating on the same infrastructure (maintenance providers, service providers, etc.).

b) Suppliers/contractors.

c) Customers.

d) Regulatory agencies.

e) Other stakeholders (users, neighbours, various authorities).

iii. Some of the interrelated methods that can be used for internal and external communication include:

a) Visible Behaviour

b) Written Communication

c) Face-to-face discussion

iv. Managers must acknowledge, and where possible, remove barriers to effective official communication that may affect the management of safety within the organisation. Examples of obstacles or barriers include illiteracy, language differences, reprisals (supervisory and/or peer), or other forms of discrimination. Incentive programs, substance testing programs, and disciplinary mechanisms should be carefully designed and implemented, taking into cognisance safety culture influences, to ensure that employees are not discouraged from reporting job-related injuries, illnesses, hazards, and risks.

7.3 CONTINUOUS IMPROVEMENT AND ORGANISATIONAL LEARNING

i. An effective SMS should rely on a continual, structured, and documented reflection upon practice through monitoring performance, analysing data and results, and establishing a feedback system to continuously improve its safety performance, culture, and attitude.

ii. The SMS must include procedures to ensure that, as far as is reasonably practicable, corrective action is taken in response to any safety deficiencies identified following inspections, testing, audits, investigations, or notifiable occurrences.

iii. The Operator shall establish, document, and maintain procedures for:

a) The development of corrective action plans that focus on ensuring that the problem or occurrence will not recur.

b) Obtaining the appropriate management approval of the recommended actions.

c) Formal monitoring of the implementation of and compliance with the corrective actions approved by management.

d) The application of controls to ensure that corrective actions are taken and that they are effective.

e) The implementation and recording of changes in procedures that result from corrective action.

iv. Procedures must be included for:

a) Registration of any corrective actions taken.

b) The review of those corrective actions.

c) The implementation of corrective actions if it is determined that corrective actions are required.

d) The assigning of responsibilities for corrective action.

e) Giving priority, when undertaking corrective action, to those matters representing the greatest safety risk.

v. Corrective action is necessary to address matters that arise from, but are not limited to:

a) Directives issued by the RSR.

b) Occurrence investigation reports.

c) Safety audit reports.

d) The evaluation of compliance with standards.

e) Risk control strategies.

f) Skills and competency requirements.

g) Safety performance data analysis.

vi. Procedures for the implementation of corrective action must provide a link to processes for the management of change where appropriate. [See section on Management of Change]. A system of internal control should apply to the management of corrective actions. While individual corrective action may be taken at a local level for some issues, there must be an overarching process where higher levels of management monitor the implementation of corrective action.

Reports on incomplete corrective actions must be provided to progressively higher levels of management as actions remain incomplete. The length of time that may elapse before the escalation occurs should be dependent on the level of risk associated with that particular action. For example, a corrective action that is assessed as safety critical may need to be reported to higher levels of management earlier, and perhaps in more detail, than one of lesser safety significance.

vii. Continuous improvement can emanate from, e.g.:

a) Auditing results.

b) SMS review.

c) Outputs from audits and inspections.

d) Output from accident reports.

e) Research.

f) Ad hoc ideas contributed by personnel.

g) New legislation, etc.

viii. To be effective and support decision-making, a continuous improvement process must cover and extend to all relevant phases of an Operator's SMS, e.g.:

a) Planning of preventive/corrective actions.

b) Their implementation on an adequate scale.

c) Assessment/monitoring/verification of their effectiveness.

d) Enforcement, review and revision of plans and risk control arrangements.

ix. In combination with appropriate statistical tools to analyse data, continuous improvement must ensure that all processes are periodically revised in a systematic way. The most common representation of this cyclic activity is the 'Plan – Do –Check – Act' management circle, or Deming cycle. Improvements should be assessed to ensure they are reasonable to be carried out. The assessment must consider wider operational and business benefits.

7.3.1 Safety data collection and analysis to review and continuously improve SMS.

i. Organisational learning and continuous improvement throughout the SMS are enabled and optimised when Operators can effectively monitor and analyse the performance of the SMS. To ensure that risk controls are applied and work in practice, an Operator needs to measure the level of application of these controls and their results. The collection of safety data and the subsequent analysis allow the Operator to measure its overall performance, and understanding where there are deficiencies in all SMS arrangements. A systematic monitoring system 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. Additional requirements for safety data collection and analysis are stated in the Regulations On Notifiable Railway Occurrences (RONO), the Occurrence Management Standard, and other relevant legislation.

ii. The collection of safety data is based on monitoring and must consider the following elements:

   a) Structured reporting of accidents/incidents / near misses / dangerous occurrences.

   b) Inspection findings (it could be for detecting non-compliance with operational arrangements and/or concerning the state of infrastructure or equipment).

   c) Audit results (mainly at the design and implementation process level).

iii. To make this data collection possible, an Operator must ensure that the information or the unit of measurement for the specified indicator is available or can be established. In addition, a periodic evaluation of the scope and viability of indicators and tolerance levels is required.

iv. The scope of data analysis must include the detection of:

   a) Any deviance from expected outcomes (using lagging indicators).

   b) Process anomalies (using leading indicators).

v. The Key Performance Indicators (KPIs) of Operators must include a selection of both leading and lagging indicators.

vi. 'Lagging' indicators measure the final outcomes that result from an activity. Lagging indicators, like the number of accidents and incidents, demonstrate if a "safe" result is delivered. In a performance measuring system, they allow the comparison with historical data, demonstrating at the same time the quality of results (e.g., improvement or worsening) and the possibility to be used in a predictive sense (e.g., the increasing number of signals passed at danger may be the precursor of a collision).

vii. However, to have a complete picture of the effectiveness of the risk control measures, a selection of leading indicators needs to be compared with set levels of tolerance. These leading indicators are mainly based on proactive monitoring of the critical elements of risk control measures (i.e., those actions or processes which must function correctly to deliver the desired outcome), but also elements of the environment and/or assumptions made when designing the risk control measures (mainly during the risk assessment process) could be part of these critical elements.

viii. 'Leading' indicators are used to monitor the effectiveness of control systems and give advance warning of any developing weaknesses before problems occur. Some examples of leading indicators are:

a) % of inspections completed to plan.

b) % of maintenance actions identified by inspections carried out to the timescale.

c) % of staff carrying out actions without the required competency.

d) % of safety critical processes reviewed to timescales.

ix. Internal accident and incident investigation provides the Operator 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 the underlying causes are to be systematically investigated. Standardised arrangements for when and how the investigation is carried out include:

a) Procedures for internal and external accident and incident notification and reporting.

b) Procedures, formats, and approaches (e.g., site protocol) for investigations are eventually differentiated according to the nature of the accident (e.g., environmental, employee injuries, transportation of dangerous goods).

c) Procedures for reporting and documenting findings, conclusions, and recommendations.

d) Procedures for reviewing risk control measures after an accident or incident, and ensuring implementation of recommendations and preventive or corrective actions to prevent recurrence.

7.3.1.1 Review of the SMS

i. The SMS must be reviewed at least annually to ensure its continuing suitability and effectiveness.

ii. The SMS must include systems and procedures for reviewing the SMS at specified periods, but at least annually. Operators must ensure the participation of workers and their representatives (Refer to 6.2.1) when reviewing the SMS. In conducting this consultation, the Railway Operator must ensure that those consulted are asked for their opinion on whether, and how, the SMS can be improved.

iii. In conducting the SMS review, the Railway Operator must ensure:

- That the effectiveness of the SMS is assessed (including an examination of records in relation to notifiable occurrences and breaches of the system).
- That the effectiveness of any revisions that were made as a result of the last review are assessed.
- That any recommendations or issues arising out of any audits or safety investigations that have occurred since the last review are taken into account; and that any issues arising from any prohibition or improvement notices that the RSR issued since the last review are taken into account.
- That any deficiencies in the system are identified.
- That methods of remedying any deficiencies are designed and assessed.
- That any opinions provided by people consulted, as to whether and how the SMS should be improved, are assessed.

- That any other suggestions for improving the system that arise during the course of the review are assessed.
- If any deficiencies or practicable improvements are identified that a plan is created to remedy those deficiencies or to effect those improvements (as the case may be).

iv. It is good practice to nominate a person(s) responsible for conducting the review and updating the risk register as appropriate.

v. All the above aspects of the SMS review must be documented, and subsequently summarised and reported in the annual safety improvement plan provided to the RSR.

vi. While the Railway Operator is required to review and submit its SMS and SMS report to the RSR as listed above, they also need to be responsive to issues as they arise and review the relevant parts of the SMS so that it may be continuously improved.

7.3.1.2 Internal Auditing of the SMS

i. Internal audit of the SMS is mission critical to determine the adequacy and effectiveness of the SMS as well as the level of compliance thereto. As a general principle, internal auditing serves the purpose of periodically reviewing the management system. In particular, the internal safety audit must assess if the procedures described within the SMS ascertain that the services of the Operator comply with relevant requirements and that all SMS processes are still effective. Operators must establish an internal auditing system, including planning of internal audits to be carried out. Staff in charge of carrying out internal auditing (auditors) must be competent and experienced in the field/matter they are assessing and skilled and adequately prepared and trained to perform audit activity. Audits must 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.

ii. The SMS must include procedures for:

a) Communicating the results of audits to those people who are responsible for the oversight of the railway operations in the area audited so that they may review the audit findings and take corrective action where appropriate.

b) Registration and implementation of recommendations for corrective action/s identified by the audit.

c) Review of the effectiveness of the audit program.

iii. The various levels of management have different roles and responsibilities for providing oversight and taking action in relation to audit findings and recommendations for corrective action. The procedures for communicating the results of audits must reflect the need to provide appropriate information to enable those with responsibility for oversight of the railway operations to meet their responsibilities within the SMS and under safety legislation. For example, the highest levels of management, (such as the CEO or Board or management committee) must be provided with information on the internal safety audit arrangements, and reports on the conduct and outcomes of audits or the audit program, and the review of the effectiveness of the audit program.

7.3.1.3 Management of Change

i. The purpose of the management of change process is, first and foremost, to ensure that change is introduced safely, as far as is reasonably practicable. Management of Change is the process of controlling changes in existing and new projects by identifying potential hazards and defining appropriate control measures before the implementation of a change. This process must be carried out during the consecutive steps of the project:

a) Identification of the need for change (e.g., after analysis of safety data, optimisation of resources, obsolescence of equipment, etc.).

b) Determining feasibility.

c) Design.

d) Planning.

ii. The above-mentioned elements of the process are expected to support the implementation of changes: the identification of the need for change, the determination of feasibility and the design of the change are mainly management driven activities, whilst planning is more a process for implementation. The final aim is to give evidence that such changes do not decrease the level of safety in the system and enabling traceability of implemented changes. The organisation as a whole must rely on the change management process to identify changes within the organisation which may affect established safety related processes and services:

a) To describe the arrangements to ensure safety performance before implementing changes.

b) To eliminate or modify safety risk controls that are no longer needed or effective due to changes in the operational environment.

iii. 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.

iv. Change management procedures in a SMS.

Operators should have a range of management of change processes that require an increasing levels of scrutiny as the potential levels of risk associated with the change increases. The SMS must include procedures for ensuring that changes that may affect the safety of railway operations are identified and managed, including but not limited to procedures for ensuring, as far as is reasonably practicable that:

a) The change is fully identified, described, and documented in the context of the specific Operator.

b) The changes are documented in a specific change register, the risk register, or other appropriate means in the SMS.

c) Affected parties are identified and, where practicable, consulted.

d) The roles and responsibilities of safety critical employees and employees of the Railway Operator are clearly specified with respect to the change.

e) The risks to safety that may arise from the change are identified and assessed.

f) The controls that are to be used to manage risks to safety and monitor safety are specified.

g) The information in the risk register is updated with any changes to risks and control measures.

h) That the proposed change conforms to legislation, regulations, and standards.

i) Where appropriate, the change should also be consistent with accepted codes or standards.

j) The safety critical employees and employees of the Railway Operator are fully informed and trained to understand and deal with the proposed change.

k) The changes involve a review of the competence requirements for the tasks to be undertaken.

l) Review and assessment of the change once implemented is undertaken to determine whether the change has been appropriately managed.

m) Monitoring and review of the effect of the change should be undertaken, documented and necessary corrective actions implemented, to ensure that control measures perform as intended.

n) Decisions are transparent and formally accepted by those responsible for decision-making within the Railway Operator.

v. Types of change to be managed

Operators can be subject to changes from both internal and external sources. Internal sources of change may include turnover in staff; the findings or recommendations of internal audits; directions from the Board or Management Committee; findings from internal investigations, organisational restructuring, or changes in the Operator's physical assets (such as new equipment).

vi. Technological change in particular may occur as:

a) Changes to the functional specification of an asset, e.g., more or less performance from a particular asset is needed in the future (as business demands may be about to change)

b) Changes to the physical characteristics of an asset, e.g., another asset with the same functional performance is needed in the future (for reliability, safety, and/or cost reasons)

c) Changes to the derived data associated with an asset, e.g., a differing maintenance task, spares needs, and technical manual for a particular asset is needed in the near future (as the current maintenance seems ineffective and/or appears costly).

vii. In some situations, change will involve an entirely new asset and operation. Such situations of a fresh design offer the ability to make step changes in safety and performance as many existing constraints are absent.

viii. External sources for change may include legislative or regulatory changes; safety investigation authorities; road authorities; other Railway Operators; suppliers; or rail contractors. These changes may present themselves as:

a) Planned change, for example, change brought about by business or strategic plans.

b) Unavoidable, unplanned, or unintended change, including 'creeping' or 'incremental' change, where the impact at any time may seem minor, but which over a period can increase risk.

c) A change to an interface, legislative change, or a direction from the RSR.

d) Temporary change (such as the installation process for new equipment).

e) Emergency or abnormal change which may be required within a short timeframe and therefore may require different controls.

ix. The Operator's management of change procedures must enable the different types of change to be identified in advance and managed appropriately.

x. Technological change for designers and suppliers

Designers and manufacturers of things that are to be used as or in connection with rail infrastructure or rolling stock have a safety duty. Certain attention must be paid to the commissioning and ongoing maintenance of rolling stock to ensure that decisions at the design stage of development consider safety at each subsequent stage of the product life cycle to minimise future risks. The risk management

process in managing technological change must encompass all aspects of design, including structures, components, systems hardware, systems software, controls, layout, and configuration.

xi. Railway Operators and designers must consider the principles of engineering safety management when commissioning or designing rail equipment or infrastructure.

xii. Consultation during change

Consultation with persons affected is an integral part of managing change and must be included, where reasonably practicable, at regular intervals throughout the management of the change process. Proper consultation with key stakeholders about proposed changes will ensure that a risk is not transferred to those stakeholders without their knowledge. The level of consultation will be guided by the scale of change; major change will likely require a wide and comprehensive consultation, whereas minor changes may only need consultation with those directly managing the task. The guiding principle is that it is better to consult with people, no matter how little they may be affected by the change, as part of an open and transparent management of change process and good risk management. There are specific requirements for whom a Rail Operator must consult with when establishing or reviewing a SMS (Refer to section 6.2.1 Decision taking & participation of workers and representatives).

xiii. Steps in the management of change:

The amount of scrutiny and detail at each step should reflect the scale and risks involved with the change. For example, a riskier project would require more careful planning and risk analysis than a routine change. There are two aspects of risk in relation to a change: (a) Risks associated with the change itself, and (b) the risk associated with the process of introducing the change (for example, the risks of building a new bridge). Each will have an influence on the practicability of potential solutions to the problem at hand. It is a fundamental objective of the change management process that both aspects of risk are managed.

STEP 1: Establish the context of the change and consult with stakeholders. This step involves identifying the change and developing the necessary plans for change management in consultation with stakeholders, including interfacing

organisations. A clear description of the current situation, including the problem or matter that the change seeks to address, and the change itself, is required. This should be sufficiently detailed to fully define the overall nature and scope of the change. Changes can be defined and analysed at several levels, including project level, component level and/or process level. More than one may be applicable. Where the Railway Operator has a range of change management processes in place that require varying levels of scrutiny, the appropriate process is selected.

Each management of change process should:

a) Describe safety documentation requirements (such as safety validation documentation), including whether a change management plan is required.

b) Specify whether an independent safety validation assessment is required and how that is to be achieved.

c) Identify the authority responsible for granting or refusing approval for implementation of the change (may include road authorities or other authorities outside of the RSR).

d) Provide criteria and guidance on the extent and nature of the consultation and briefing that should be carried out for the level of safety validation being applied.

Changes that involve new or modified assets, plant, equipment, or information technology for which a project life cycle applies must be subject to processes that consider the life cycle of the project, including:

a) Concept and feasibility.

b) Definition of requirements.

c) Design.

d) Implementation.

e) Installation and commissioning.

f) Operations and maintenance.

g) Modification.

h) Decommissioning and disposal.

STEP 2: Undertake a risk assessment.

This step is the actual undertaking of a risk assessment on the proposed change and deciding how the risk, including the controls, can be managed as far as is reasonably practicable. Appropriate use of risk management tools and techniques as part of the management of change process ensures that the potential impacts are understood. This requires an in-depth understanding of the change proposed, its potential impacts on current activities and operational interfaces. When an Operator undertakes a risk assessment, the emphasis is usually on any new incidents or associated hazards that could arise from the proposed change. The assessment should also take into consideration any existing risks and common cause failures should be considered where the change is not independent of existing systems or functions. The Operator should compare the level of risk before and after the proposed changes. The Operator should ensure that the new cumulative impact of all the hazards does not increase the overall risk of rail operations without appropriate management. This may require the implementation of additional controls initially rejected because the benefit was marginally less than the resources to implement them.

The RSR requires that Operators eliminate or reduce the risks to the safety of their operation as far as is reasonably practicable. If the level of residual risk increases following a change, it could be argued that the lower level of risk that existed before the change was introduced was clearly reasonably practicable and that the change, which increased the level of risk, is therefore not in compliance with the safety duty. Therefore, as a general principle, Operators must be endeavouring to achieve a level of residual risk following implementation of the change that is at least the same or better than the residual risk that existed prior to the implementation of the change. If an increase in residual risk is unavoidable, it would be prudent for the Railway Operator to keep records demonstrating why the lower level of risk is no longer reasonably practicable. Risk assessments of proposed changes should extend to consideration of opportunities to improve previously existing risk controls.

Change may alter the balance of risk exposure to different groups. Operators must endeavour to ensure an equitable balance of risk exposure to affected groups. Where the change involves a potential increase in risks to another party, the

management of the change process must cover how those risks are likely to be increased and subsequently managed. For example, a change may reduce risk to a group, but introduce or increase risk to another group or an individual. In such circumstances, there is a need to balance the risks affecting each group so that one group does not suffer very high levels of residual risk to reduce or remove the risk to the other. Where existing risk controls are removed, the decision should be documented, explaining what controls have been removed and why, and how the associated risks are to be managed.

STEP 3: Evaluate levels of change and develop an implementation plan.

This step requires evaluation of the consolidated information gathered, further consultation (if practicable) with appropriate stakeholders and making decisions on the options available. The change and associated activities are identified, and an implementation plan is developed. The implementation plan must address a range of matters including: plans for introducing the change including all necessary modifications to the SMS and regulatory approvals; communication, whereby important changes regarding operations, equipment and procedures are effectively communicated throughout the organisation; requirements for instruction and training; any additional resources required to implement the change, for example supervision or verification; documents that need to be revised, for example, operating procedures, risk registers, training material, interface coordination plans, emergency plans and management of change documentation itself; and plans for monitoring and reviewing the change following implementation.

Regulatory requirements and timeframes are an important part of the implementation plan. In considering the time at which to lodge an application for variation to accreditation, for example, an accredited Operator will need to be mindful of the definition of railway operations, and the circumstances in which the accredited Operator may be considered to have commenced any new railway operations not addressed in the scope and nature of the initial accreditation. For instance, an accredited Operator would need to apply and have approved any application for variation to accreditation before constructing any railway, railway track and associated track structure or rolling stock. Similarly, an accredited Operator must have a variation approved before commissioning any new rail

infrastructure or rolling stock. For this reason, the accredited Operator must ensure that any application for variation of accreditation is submitted in sufficient time before the carrying out any new railway operations to ensure compliance with the RSR. It is therefore advisable that the Operator contacts the RSR early in the planning process to determine and initiate any regulatory requirements for the proposed change. Information from the RSR may better allow the Operator to plan for notification or approval times and improve the RSR's understanding of the project.

STEP 4: Document changes and obtain approvals.

This step involves consolidating documentation on the change, including any supporting records (such as external reports, quotes, or findings). The change must be clearly documented and gain internal sign off from the appropriately authorised independent person or persons within the Operator. An independent safety validation where the proposed change relates to major projects must be undertaken by an appropriately experienced and/or qualified person who is independent from the change. In the railway industry, this person is normally called an Independent Competent Person (ICP). There are three important things to consider when appointing an ICP.

a) Competence

The competent person must have the skills and knowledge needed to carry out the Safety Validation. Operators may wish to gather and keep evidence of this. This evidence could include:

- Experience in the industry or the type of work and workplace.
- Direct knowledge of the specific process they are overseeing, such as making sure vehicles are acceptable or replacing signal systems.
- experience of the regulatory process, in terms of setting standards and gathering evidence appropriately.
- Written qualifications that can be checked.
- Being aware of current best practice.
- Being aware of the limits of their skills and experience.

b) Impartiality

The competent person must not be responsible for anything they will have to assess because that might cause them to be biased in their assessment.

c) Independence

The competent person must not be part of the line management team that is responsible for the project. For example:

- They should not benefit personally from the project being completed successfully and quickly.
- They should not profit (other than any remuneration for acting as the independent competent person) from the project being introduced, such as if they run or own shares in an organisation that makes parts being used in the project.
- They should not verify the suitability of a product or component that they designed or built.
- An ICP should report directly to senior management and not be responsible for designing the project.
- They must have the authority to ask for information, carry out examinations and make recommendations.

The main sources of ICPs in the railway sector are likely to be:

- In-house experts (see below).
- Other Operators.
- Consultants.
- Individuals acting independently.

In-house ICPs: A competent person does not have to be employed by another organisation (a 'third party') to be independent. It is perfectly acceptable for SV to be done in-house. The most important thing is to show that the ICP is independent enough from the project to give an objective (unbiased) assessment. It is important that the ICP has appropriate levels of impartiality and independence from pressures, especially of a financial or operational nature, which could affect sound

judgment. They should not verify their own work, and their management lines should be separate from those people whose work they are checking. For instance, it is acceptable in principle for an Operator's in-house team or chief engineer to check work done elsewhere in the same organisation. However, it would influence objectivity if that team or individual's management chain included the manager responsible for meeting targets that might be adversely affected by the findings of the verification process. Where a group of individuals are fulfilling the ICP role, the transport Operator, or the responsible person should make arrangements to ensure that tasks such as record keeping are carried out consistently. Decisions on verification standards are for the transport Operator or the responsible person to take. If ICPs have differing views, the transport Operator or responsible person will need to make an informed decision on how to proceed.

STEP 5: Review of the Safety management system

This step involves the Operator reviewing and revising, where necessary, its SMS, risk register, emergency plans and interface agreements.

STEP 6: Implementation Once a change has received the necessary internal and external approvals, the change may be implemented using the approved implementation plan. It is essential that the approved implementation plan is fully carried out, including making all necessary modifications to organisational documentation, such as the SMS, risk assessments and other operational documentation.

STEP 7: Monitoring and review

The following questions should be asked at this step in the management of change process:

- Have any new risks eventuated, or pre-existing risks increased after implementation? Have any pre-existing risks been reduced or eliminated?
- Are additional risk controls, implemented as part of the change, appropriate?
- have performance targets for the change been set, and where applicable organisational key safety performance targets been reviewed?
- Has training been provided to staff affected by the change?

- Has a post implementation competency assessment been conducted to ensure the training provided was adequate for facilitating the change?
- Is there a process to revise the risk assessment as new information accumulates?

Monitoring and review arrangements can be introduced immediately following the implementation of the change to ensure all risk controls, including training, have been effective, and that documentation has been updated.

Changes to the SMS and Railway Operations

Changes to the specific conditions imposed by the RSR on the granting of a Safety Permit may only be authorized by the Regulator.

The Operator is required to carry out operations in compliance with the conditions of his Safety Permit, which includes the SMS and SMS Report. The Operator shall keep his SMS Report up to date, amending it to reflect changes in operations.

Changes to an Operator's SMS and/or the SMS Report are to be expected, particularly in the early stages after granting of a Safety Permit, in the light of experience, after audit recommendations, and at the implementation of requirements imposed by the Regulator.

xiv. Operators must manage all risks within their operations while also complying with the requirements for risk management and risk assessment as prescribed in SANS 3000- 1 (Railway Safety Management) and in compliance with the Common Safety Method on Risk Assessment (CSM-RA) Guideline (Refer to Annexure B).

xv. Material changes to the SMS report, including changes to the SMS and new works, shall be submitted to the RSR for approval and issuance of a no objection confirmation. Such submissions must be made at least 30 days before the changes are to be effected. This requirement does not prevent an Operator from taking immediate action should safety be compromised, or when it has the potential to be compromised. Minor changes to conditions of the Safety permit that result from changes to the SMS, including the SMS Report, shall be submitted to the RSR for noting within 30 days of the changes being made.

Examples of minor changes to the SMS:

- Changes to the management team and or organisational structures which will not affect the safety organisation of the Operator.
- Insignificant changes to staff deployment and management, supervisory or inspection responsibilities (or both).
- Minor changes to the audit regime, including the appointment of a new auditor; minor changes to the audit scope and or audit frequency.
- Minor changes made to operating agreements.

Examples of Material changes to the SMS:

- New lines, extensions, discontinued and abandoned lines.
- Changes to the management team and or organisational structures which may affect the safety organisation of the Operator.
- Increases to line operating speeds over part of or all of the operations.
- Significant changes to operating procedures that require additions to or amendments of operating standards.
- Changes to train control systems or equipment (or both) over part of or all of the operation, including arrangements for workplace protection.
- Motive power changes – steam to diesel, diesel to electric, etc.
- Non-electrified to electrified lines.
- Changes to inspection procedures, for example, track inspection frequencies, bridge examinations, procedure, and frequencies; structure and traction overhead inspections.
- Changes to rolling stock and infrastructure examination and maintenance frequencies, etc.
- Alterations to fixed and moving structure gauges.
- Alteration to track standards, including material specifications, geometric configuration, and clearance standards.

- Alterations to bridge and structure loadings, material specifications and clearance standards; introduction of new types of motive power, including aspects that relate to axle loading, braking, and coupling systems and aspects that require additions or changes (or both) to existing standards or operating procedures.
- Introduction of new or substantially changed rolling stock, including aspects that relate to width, length, height, loading capacity, and axle loading and aspects that require additions or change (or both) to existing mechanical and operating standards or operating procedures (or both).
- Introduction of new on-track equipment that requires any additions or changes (or both) to standards or operating procedures.
- Introduction of new train services.
- Changes to operating agreements, including access or running rights agreements.
- Any other new works that affect the SMS (refer to Common Safety Method on Risk Assessment (CSM-RA)

8. EXEMPTIONS

In accordance with The Act, the SMS requirements set out in this Determination apply to all railway Operators (i.e., Group A, B and C Operators) who apply for, are granted, and are required to maintain a railway safety permit issued by the Railway Safety Regulator. Operators that may be considered by the RSR for exemptions on selected requirements of this Determination include the following:

8.1 Temporary Safety Permit

Temporary Safety Permits (TSP) are short-term permits issued to active railway Operators only for operations not yet covered by an existing safety permit as an interim arrangement pending the application and issuing of a Group A, B or C Safety Permit. Immediately after being issued with a TSP, Operators should proceed with the preparation and submission of the safety permit application for the appropriate permit Group required. TSP may be issued to an existing Operator where the RSR is not convinced or satisfied with the safety arrangements of the Operator. The SMS elements that TSP applicants are exempt from are described in the SPCAM.

8.2 Construction Train Safety Permit

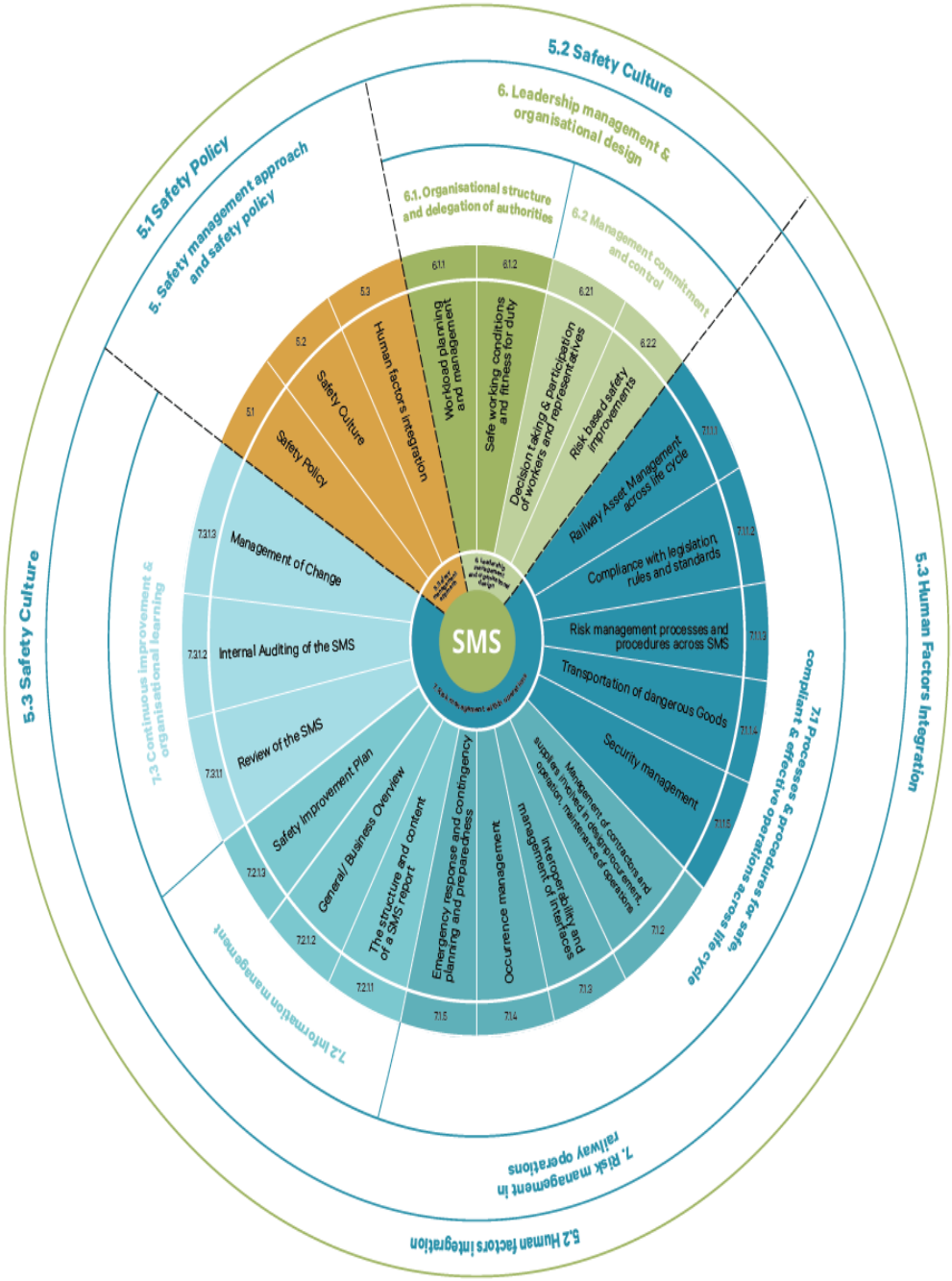
Construction Train Safety Permits (CTSP) are issued to organisations which are not in possession of a Safety Permit, but who are accountable and responsible for the operation of construction trains, which include material and ballast trains, for the construction of new railway infrastructure. The SMS elements that CTSP applicants are exempt from are described in the SPCAM.

8.3 Test and Commissioning Safety Permit

Test and Commissioning Safety Permits (TCSP) are issued to organisations that are not in possession of a Safety Permit, but who are accountable and responsible for the operation of trains to test and commission new or upgraded rolling stock and new or upgraded railway infrastructure elements, including the impact thereof on existing rolling stock and infrastructure elements. The SMS elements that TCSP applicants are exempt from are described in the SPCAM.

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

ANNEXURE A: Safety Management System (SMS) Wheel Overview Of The SMS Determination



ANNEXURE B: Common Safety Method on Risk Assessment (CSM-RA) Guideline

DEPARTMENT OF TRANSPORT

NO. 4563 **28 March 2024**

+27 10 495 5391 0800 444 888
helpdesk@rsr.org.za www.rsr.org.za
Railway Safety Regulator @Rail_Safety

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRACK

RAILWAY SAFETY REGULATOR GENERAL NOTICE
REF: 12/12/1-2023/2024

PUBLICATION OF THE COMMON SAFETY METHOD ON RISK ASSESSMENT AS AN ADDENDUM TO THE EXISTING SAFETY MANAGEMENT SYSTEM DETERMINATION, FOR IMPLEMENTATION AND COMPLIANCE BY RAILWAY OPERATORS

I, Mmuso Selaledi, Acting Chief Executive Officer of the Railway Safety Regulator (RSR), in terms of the National Railway Safety Regulator Act No. 16 of 2002, as amended ("the Act"), hereby publish the Common Safety Method on Risk Assessment (CSM-RA), as an Addendum to the existing latest version of the Determination in Terms of Section 28 of the National Railway Safety Regulator Act 16 Of 2002, as Amended for implementation and compliance by the Railway Operators.

This CSM-RA addendum applies to all Railway Operators as defined in terms of the Act. The Railway Operators are henceforth required to comply by implementing the requirements which are specified in this addendum. Operator Implementation Guide which provides guidelines on the implementation of the CSM-RA requirements, will be shared with the Operators to ensure compliance.

For further clarifications, enquiries may be addressed to: Mr O M Monoketsi, E-Mail: olebogeng.monoketsi@rsr.org.za, +27 10 495 5391/087 284 6666 or Mr R Ntshingila, E-Mail: reginald.ntshingila@rsr.org.za, +27 10 495 5391/087 284 6628.

Signed at Waterfall on 22 March 2024

Yours faithfully
Digitally signed by Mmuso Selaledi
Date: 2024.03.22 07:53:13 +02'00'
Mmuso Selaledi
Acting Chief Executive Officer
Railway Safety Regulator

HEAD OFFICE: +27 10 495 5391 | Building 4, Waterfall Point Office Park, Cnr Waterfall and Woodmead Drive, Waterfall City, Midrand, 1685, South Africa | **CENTRAL REGION:** +27 87 284 6591 | Building 2, Waterfall Point Office Park, Cnr Waterfall and Woodmead Drive, Waterfall City, Midrand, 1685, South Africa | **COASTAL REGION:** +27 21 493 1718 | Long Street Building, 2 Long Street 11th Floor, Cape Town 8000, South Africa | **EASTERN REGION:** +27 31 492 7289 | Embassy Building (22nd Floor), 199 Anton Lembede Street, Durban, 4000, South Africa

This gazette is also available free online at **www.gpwonline.co.za**

RAILWAY SAFETY REGULATOR
RAIL SAFETY ON THE RIGHT TRA

ADDENDUM TO THE SMS AND SMSR DETERMINATION

Common Safety Method on Risk Assessment (CSM-RA)

This gazette is also available free online at www.gpwonline.co.za

TABLE OF CONTENTS

1. BACKGROUND 3

2. INTRODUCTION 4

2.1. Purpose 4

2.2. Scope and Objectives 5

2.3. Benefits of Applying CSM-RA 5

2.4. Managing Risk for Railway Changes 6

2.5. Definitions 7

2.6. Abbreviations and Acronyms 8

3. MINIMUM SUBMISSION REQUIREMENT 8

4. APPLICABILITY OF CSM-RA 9

5. PROCESS STEPS FOR APPLYING CSM-RA 9

6. CSM-RA PROCESS FLOW 14

7. ANNEXURE A: CSM-RA REPORT SUBMISSION TEMPLATE 15

8. ANNEXURE B: MINIMUM SUBMISSION REQUIREMENT 24

9. ANNEXURE C: LIST OF SUPPORTING DOCUMENTS 35

This gazette is also available free online at **www.gpwonline.co.za**

1. BACKGROUND

The Act, states in Section 5 that the objects of the Regulator are to:

a) oversee safety of railway transport;

b) promote improved safety performance in the railway transport industry;

c) develop any regulations that are required in terms of the Act;

d) monitor and ensure compliance with the Act; and

e) give effect to the objects of the Act.

The overall purpose of a railway Safety Management System (SMS) is to ensure that organisations achieve their business objectives in a safe manner. Therefore, the Regulator regulates the railway safety by issuing operating Safety Permits to railway operators on the basis of an established and robust Safety Management System (SMS) that is fit for purpose and complying with the requirements of the Act and the Regulators Determination on the form and content of SMS and the Safety Management Systems Report (SMSR). The SMS & SMSR

Section 8 of the SMS Determination stipulates that Railway operators need to ensure control of the railway system by setting arrangements to comply with safety requirements and identifying and managing existing and future risks associated with the railway operations. Furthermore, the Determination requires that a risk management approach be applied in managing railway safety. This approach seeks to ensure that the technical and operational hazards are identified and that the associated risks to people, property and the environment are managed to a level that is as low as is reasonably practicable (ALARP).

Section 8.2.3 of the SMS & SMSR Determination requires that railway organisations must have systems in place to control changes to new projects and to manage the related operational risks. These should be applied to manage changes to techniques/technologies, operational procedures/rules/standards (either internal or involving interfaces) and organisational structure.

This gazette is also available free online at **www.gpwonline.co.za**

The Regulator is specifically mandated to develop regulations on matters relating to the to design, installation/construction/manufacturing, inspection, testing and commissioning, operations and, monitoring and maintenance, modification/alteration/upgrades and decommissioning and /disposal design, construction or, manufacturing, alteration, inspection, testing and commissioning, operations, monitoring and maintenance and operation, modifications/alteration and decommissioning/disposal of rolling stock, infrastructure and stations.

CSM-RA seek to justify the need for the adoption of a harmonised approach in risk evaluation and assessment by describing the risk management challenges associated with the introduction of significant changes in the railway systems, operational standards and organisational structures.

2. INTRODUCTION

This document provides a harmonised approach in risk evaluation and assessment by describing the risk management challenges associated with the introduction of significant changes in the railway systems, operational standards and organisational structures. The document further provides a template to be used by operators when making submissions to the RSR, that relates to introduction of the said changes to the railway systems.

2.1. PURPOSE

Application of the CSM-RA methodology for risk evaluation and assessment to be applied by the industry when changes are introduced to the railway systems. These changes could be related to introduction of new works and significant changes to techniques/technologies, operational procedures/rules/standards and organisational structure as follows, but not limited to:

- Construction of new lines/infrastructures
- Changes to operating speeds

This gazette is also available free online at **www.gpwonline.co.za**

- Significant changes to operating procedures
- Changes to train authorization and control systems or equipment
- Changes to the type of motive power used
- Introduction of new or modified rolling stock
- Infrastructure upgrades/modifications
- Infrastructure decommissioning/disposal

Changes in the organisational structures that affect operational safety

2.2. SCOPE AND OBJECTIVE

This document applies to all railway operators when introducing new changes to their SMS as discussed in paragraph 1.

The objective of this harmonised method is then to ensure that the railway industry applies, in a consistent manner, an approach that will ensure that safety levels are not compromised when introducing changes, and where practical, improvements in safety levels are achieved. Moreover, a harmonised method for conducting these assessments will also increase the Regulator's confidence in accepting the assessed levels of risk and facilitate the Approvals/"No Objection" for allowing changes to be operationalised. The safety method then seeks to prescribe an approach to be used to manage risk when changed is introduced.

2.3 BENEFITS OF APPLYING CSM-RA

Some of the benefits for adopting such an approach are the following:

- Safety demonstration will become easier and less onerous for the change proposers;
- The principles of cross-acceptance can be applied by the Regulator.
- An internationally recognised method may be adopted, this would make it possible for the Regulator to accept technologies on the basis of them

This gazette is also available free online at **www.gpwonline.co.za**

being accepted by safety authorities that apply the same safety method from around the world.

- Approvals/"No Objection" by the Regulator can be expedited.
- The perceived regulatory burden in obtaining Approvals/"No Objection" from the Regulator will be lessened.

2.4 MANAGING RISK FOR RAILWAY CHANGES

The Regulator fulfils its safety oversight mandate on new railway works and technology developments by conducting safety assessment and providing Approvals/"No Objection" on all life cycle phases of railway projects. Safety reviews are conducted by the Regulator on submissions or Notifications by operators to introduce new or modified/altered systems, sub-systems and components. These regulatory safety assessments aim to ensure that the impact of the intended changes is considered within the immediate environment of its application and from a systemic perspective encompassing asset/operational system life cycle.

For each new technology/new works the operator submissions throughout the life cycle phases have to:

- Describe the scope of the intended action - bearing in mind the whole system that will affect and be affected by the new technology. The Regulator intends to promote the principles of systemic engineering in the application of the whole system approach and sustainable designs;
- Identify the safety risks and describe the mitigations;
- Identify and describe the life cycle phases pertaining to the specific new technology; and
- Improve the state of safety within the railway system.

Submissions on risk assessments are paramount in demonstrating that risks imposed by changes in the railway systems have been controlled to acceptable levels. These submissions are thus required by the Regulator when operators/change proposers submit Notifications at all life cycle phases of the

This gazette is also available free online at **www.gpwonline.co.za**

intended changes (new works or technology developments) – from concept phase to design, installation/construction/manufacturing, testing and commissioning, operations and monitoring and maintenance, modification/alteration/upgrades and decommissioning and disposal phases of the systems.

It has been noted by the Regulator that an approach of allowing the change proposers to conduct risk assessment in an arbitrary manner, not being guided by any standardised approach, is plagued with many flaws. The submissions on risk assessments have been found to be grossly inadequate in many cases. At the root of the issue is the absence of a common approach or the guidance for specifying and demonstrating compliance requirements and acceptable safety levels.

The Regulator is thus providing this document as a guideline for the industry to be applied when undertaking these assessments in preparation for submission to the RSR.

2.5 DEFINITIONS

Term	To be understood as
Approvals	An approval means a written consent by Regulator to proceed with a requested activity, while the operator remains responsible to meet all applicable standards and safety requirements for all the applicable life cycle phases of proposed new works and technology developments, operational and organizational changes.
No Objection	This is a legal notice issued to the operator by the RSR to go ahead with the changes applied for, which allows the operator to advance/progress from one life cycle phase to the next.

This gazette is also available free online at **www.gpwonline.co.za**

Notifications	This is a submission required from the operator who intends to make any major changes to his/her SMS long before detail planning commences.
Technology	Created capability and/or capacity relating to systems, processes, equipment, and procedures applicable to rolling stock, railway infrastructure elements and stations.
Regulator	Railway Safety Regulator (RSR) defined in terms of the National Railway Safety Regulator Act.

2.6 ABBREVIATIONS AND ACRONYMS

Abbreviation	Description
ALARP	As Low as Reasonably Practical
ACT	National Railway Safety Regulator Act No. 16 of 2002
CSM-RA	Common Safety Method for Risk Assessment
SMS	Safety Management System
SMSR	Safety Management System Report
SANS	South African National Standards

3. MINIMUM SUBMISSION REQUIREMENTS

The Minimum Submission Requirements are defined as requirements that must be adhered to by all operators who intend to implement changes to their railway operations from concept phase to design, installation/construction/ manufacturing, inspection, testing and commissioning, operations and monitoring, maintenance, modification/alteration/upgrades, decommissioning and disposal phases. The requirements to be adhered to are illustrated in Annexure B.

This gazette is also available free online at **www.gpwonline.co.za**

4. APPLICABILITY OF CSM-RA

When does the CSM-RA apply?

4.1 The CSM-RA applies when **ANY** technical, operational or organisational change is being proposed to the railway system. A person (operator) making the change needs to firstly consider if a change has an impact on railway safety.

4.2 If there is no impact on railway safety, the risk management process in the CSM-RA need not be applied and the operator must keep a record of how it arrived at its decision.

4.3 Does the change have an impact on safety, the operator must assess whether the change is significant or not by using criteria in the CSM-RA.

4.4 In case of significant changes, the operator must apply the risk management process in the CSM-RA. If the change is not significant the operator is not obliged to apply the risk management process in the CSM-RA, but it is strongly recommended to use the process to manage non-significant railway safety risks. The operator must keep a record of how it arrived at its decision.

4.3 This process is summarised in Figure 1.

5. PROCESS STEPS FOR APPLYING CSM-RA

In making change submissions to the RSR in line with the provisions captured in paragraph 2 above, the operators must capture/address the requirements detailed in paragraphs 5.1 to 5.8 with all supporting documents.

5.1 PROJECT/SYSTEM DEFINITION

This section in the report requires the proposer to define the aspects of the project or the proposed change to include details contained in Annexure A.

This gazette is also available free online at **www.gpwonline.co.za**

5.2 CHANGE SIGNIFICANCE EVALUATION

Criteria for assessing significance of the project using the CSM-RA Methodology

The significance of the proposed change must be assessed based on the impact it will have on safety and must be evaluated using the criteria set out from section 5.2.1 to section 5.2.6 below:

5.2.1 Failure Consequence Evaluation

This evaluation looks at the most credible worst-case scenario in the event of failure of the system under assessment. What is the potential Impact on safety? if the failure of the system has the potential to lead to any injury / fatality, then there is a safety impact. Briefly describe the consequence of failure.

One should end with a statement by indicating whether the evaluation is judged to be significant or insignificant in this respect.

5.2.2 Degree of Novelty

This evaluation looks at the innovative nature of the change within the railway environment and what is new to the organisation.

Has this been done before in our or other organisation/industry? Is this something new to us?

One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

5.2.3 Complexity of Change

This evaluation looks at the various number of skills required to apprehend the complexity of the change by a single person or discipline? e.g., does the proposed change require a combination of totally different competences thus different persons to be evaluated or applied? If yes, then the change probably significant

This gazette is also available free online at **www.gpwonline.co.za**

Here the organisation needs to describe the extent of complexity and resources required to implement the proposed change during each phase of the projects or products life cycle.
One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

5.2.4 Monitoring Capacity

In this evaluation, the organisation must demonstrate its ability or inability to monitor the effects of the proposed change throughout the change's life cycle and thus the ability or inability to intervene appropriately when undesired events transpire.
One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

5.2.5 Reversibility

The organisation should state the degree of difficulty to revert to the current status quo as well as what resources would be required to do so and duration the reversion.
One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect and also state at what stage is reversibility forfeited.

5.2.6 Additionality

The proposer should evaluate the significance of the proposed change(s) when also considering all recent safety related changes to the system under review, which may or may not have been deemed to be significant or not when considered in isolation.
One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

This gazette is also available free online at **www.gpwonline.co.za**

5.2.7 Significance Decision

Based on the evaluation conducted in sections 5.2.1 to 5.2.6 above, the proposed system/project/change is considered SIGNIFICANT/NOT SIGNIFICANT. (If the submission meets two or more of the significance test criteria, then the submission is considered SIGNIFICANT)

NB: In case of significant changes, the operator must apply the risk management process in line with the CSM-RA requirements (i.e.. continue with the process from section 5.3 onwards), and if the change is not significant the operator is not obliged to apply the risk management process according to the CSM-RA, however the operator must keep a records of how it arrived at its decision. It is strongly recommended to also use this process to manage non-significant railway safety risks.

5.3 RISK ANALYSIS

This section involves identifying and analysing potential events that may negatively impact the safety of individuals, assets, and/or the environment as a result of the proposal as well as making judgments "on the tolerability of the risk on the basis of a risk analysis" while considering influencing factors.

5.3.1 Hazard Identification
5.3.2 Hazard Classification
5.3.3 Risk Acceptability Decision

5.4 SELECTION OF RISK ACCEPTANCE PRINCIPLE

The choice of which Risk Acceptance Principle(s) to apply, or a combination thereof, must be appropriate to the strategy you intend to use to demonstrate that the change is safe. Select one of the more of the following criteria for use to support the submission:

This gazette is also available free online at **www.gpwonline.co.za**

5.4.1 Application of Codes of Practice,

5.4.2 Similarity Analysis with Reference System and/or

5.4.3 Explicit Risk Estimation.

5.5 RISK EVALUATION

In this section a verification by the proposer should be performed to ensure that the criterion/criteria chosen through the Risk Acceptance Principle is/are met and/or complied with using one or more of the following methods.

5.6 SAFETY REQUIREMENTS

In this section the proposer is required to, by way of demonstration, ensure that safety requirements identified through the Risk Acceptance Principle or combination thereof and risk analysis are met.

5.7 INDEPENDENT ASSESSMENT DECLARATION

In this section the proposer is required to assure the assessor that the entire CSM-RA regulatory tool has been applied correctly in evaluating the proposed change. For significant projects, this must be audited/checked by an independent person/body.

This portion of the report should be completed by a suitably qualified independent Assessor, registered with the relevant council.

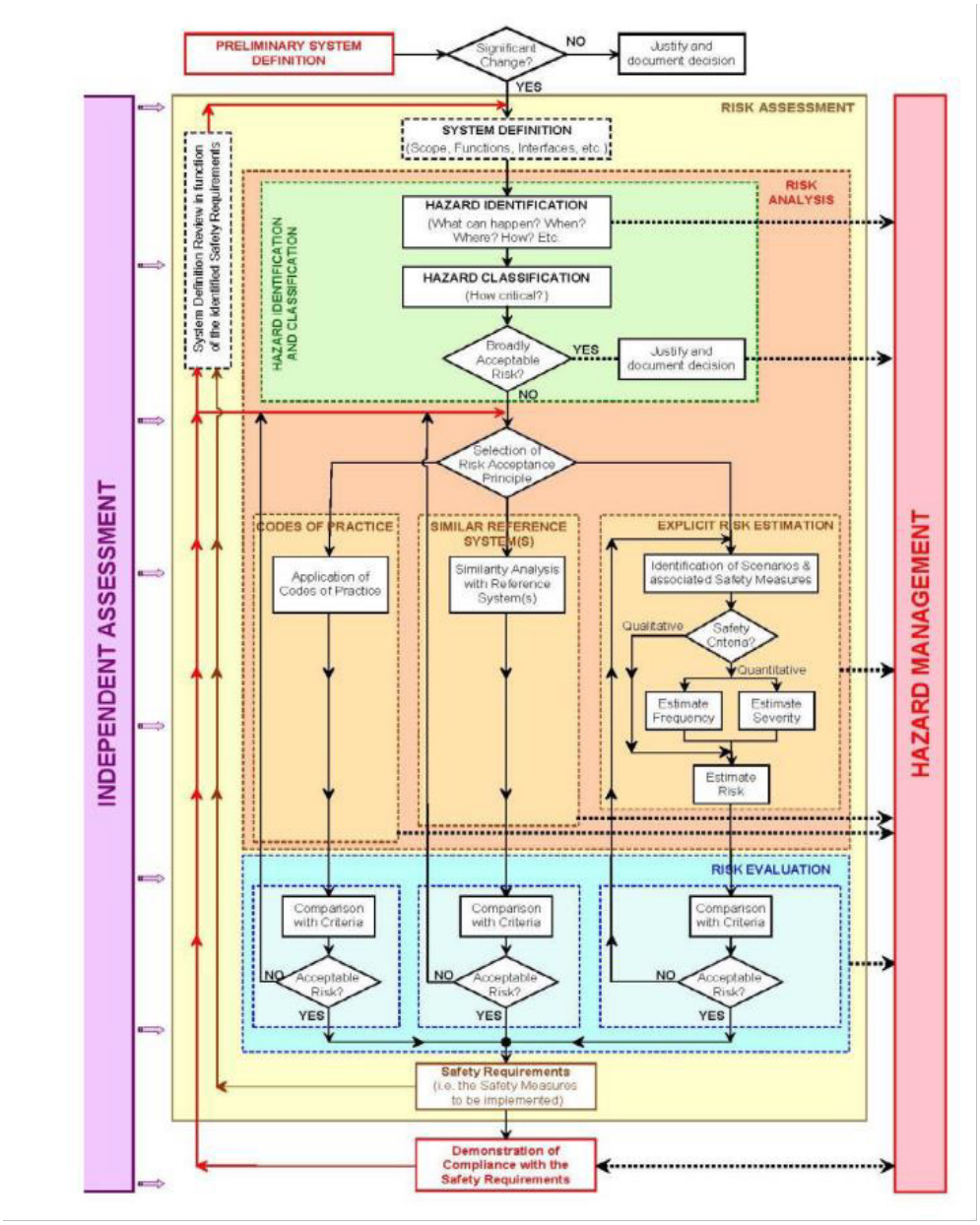
The Appointment of this Independent Assessor shall be from Conception stage of the proposed change and will be maintained through all life cycle phases prior to operational phase and handover to the asset owner.

5.8 DOCUMENTATION

All Life cycle stages of the application of the CSM-RA and the hazard record established for use through the implementation of the change, should be documented.

This gazette is also available free online at **www.gpwonline.co.za**

6. CSM-RA PROCESS FLOW: FIGURE 1



This gazette is also available free online at www.gpwonline.co.za

7. ANNEXURE A:

CSM-RA

Report Submission Template

(Common Safety Method – Risk Assessment)

This gazette is also available free online at **www.gpwonline.co.za**

TABLE OF CONTENTS

1. PRELIMINARY SYSTEM DEFINITION/EXECUTIVE SUMMARRY

2. DEFINITIONS

3. PROJECT/SYSTEM DEFINITION

4. CHANGE SIGNIFICANCE EVALUATION

4.1. Failure Consequence Evaluation

4.2. Degree of Novelty

4.3. Complexity of Change

4.4. Monitoring Capacity

4.5. Reversibility

4.6. Additionality

4.7. SIGNIFICANCE DECISION

5. RISK ANALYSIS

5.1. Hazard Identification

5.2. Hazard Classification

5.3. RISK ACCEPTABILITY DECISION

6. SELECTION OF RISK ACCEPTANCE PRINCIPLE

6.1. Application of Codes of Practice

6.2. Similarity Analysis with Reference System

6.3. Explicit Risk Estimation

7. RISK EVALUATION

8. SAFETY REQUIREMENTS

9. INDEPENDENT ASSESSMENT DECLARATION

This gazette is also available free online at **www.gpwonline.co.za**

1. PRELIMINARY SYSYTEM DEFINITION/EXECUTIVE SUMMARRY

The executive summary should summarize the entire report or proposal or a group of related reports in such a way that readers can rapidly become acquainted with the large body of material without having to read it all. It usually contains a brief statement of the problem or proposal covered in the major document(s), background information, concise analysis, and main conclusions. It is intended as an aid to decision-making by readers.

2. DEFINITIONS

Abbreviation/Word	Meaning

3. PROJECT/SYSTEM DEFINITION

This section of the report requires the proposer to define the following, but not limited to, aspects in detail:

- The change objective.
- The system's physical boundary/area of implementation.
- The interfaces with other systems, including human capital and general public.
- A list of systems, Human-machine interface, which have a link with the system under consideration.
- Content of these interfaces (what are the possible outputs & inputs?)
- The system's functions (necessary for the hazard identification)
- The system environment which it operates, such as Intended working temperature range, rural/built-up environment, other influential environmental criteria, etc..

This gazette is also available free online at **www.gpwonline.co.za**

- Is there electricity in the vicinity and thus possibly EMP disturbance possible?
- Are there shocks/vibrations to which the system will be submitted?
- How as well as by whom will the system be operated?
- The safety measures already in place with the system before change.
- Assumptions that may limit the validity of the risk assessment

4. CHANGE SIGNIFICANCE EVALUATION

The significance of the proposed change will be assessed based on the impact it will have on safety and will be evaluated using the criteria set out from section 4.1 to section 4.6 below:

4.1 Failure Consequence Evaluation

This evaluation looks at the most credible worst-case scenario in the event of failure of the system under assessment. What is the potential Impact on safety? if the failure of the system has the potential to lead to any injury / fatality, then there is a safety impact. Briefly describe the consequence of failure.

One should end with a statement by indicating whether the evaluation is judged to be significant or insignificant in this respect.

4.2 Degree of Novelty

This evaluation looks at the innovative nature of the change within the railway environment and what is new to the organisation. Has this been done before in our or other organisation/industry? Is this something new to us?

One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

4.3 Complexity of Change

This evaluation looks at the various number of skills required to apprehend the complexity of the change by a single person or discipline? e.g. does the proposed change require a combination of totally different competences thus different persons to be evaluated or applied? If yes then change probably significant. Here the organisation needs to describe the extent of complexity and resources required to

This gazette is also available free online at **www.gpwonline.co.za**

implement the proposed change during each phase of the projects or products life cycle.

One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

4.4 Monitoring Capacity

In this evaluation, the organisation must demonstrate its ability or inability to monitor the effects of the proposed change throughout the change's life cycle and thus the ability or inability to intervene appropriately when undesired events transpire.

One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

4.5 Reversibility

The organisation should state the degree of difficulty to revert to the current status quo as well as what resources would be required to do so and duration the reversion.

One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect and also state at what stage is reversibility forfeited.

4.6 Additionality

The proposer should evaluate the significance of the proposed change(s) when also considering all recent safety related changes to the system under review, which may or may not have been deemed to be significant or not when considered in isolation.

One should end with a statement indicating whether the evaluation is judged to be significant or insignificant in this respect.

4.7 Significance Decision

Based on the evaluation conducted in sections 4.1 to 4.6 above, the proposed system/project/change is considered SIGNIFICANT/NOT SIGNIFICANT.

This gazette is also available free online at **www.gpwonline.co.za**

5. RISK ANALYSIS

This section involves identifying and analysing potential events that may negatively impact the safety of individuals, assets, and/or the environment as a result of the proposal as well as making judgments "on the tolerability of the risk on the basis of a risk analysis" while considering influencing factors.

5.1 Hazard Identification

This section requires the identification of all reasonably foreseeable safety risks and potential hazards to all stakeholders. The proposer(s) should ask themselves: if my system fails, what are the potential accidents that can occur? This exercise should typically be carried out through a multi-functional approach also taking into cognisance all affected stakeholders and representation during the identification exercise.

The result should be a comprehensive risk register and hazard log developed by all affected stakeholders.

5.2 Hazard Classification

This section requires the classification of all identified safety risks and hazards using potential consequences at train level during hazard identification and using the severity classes defined in the applicable standards.

5.3 Risk Acceptability Decision

Following the analysis of the risk associated with the proposed project/system/change conducted in sections 5.1 to 5.2 above, indicate whether the risks introduced as a result of the proposed system/project/change are considered to be ACCEPTABLE/NOT ACCEPTABLE.

This gazette is also available free online at **www.gpwonline.co.za**

6. SELECTION OF RISK ACCEPTANCE PRINCIPLE

The choice of which Risk Acceptance Principle(s) to apply, or a combination thereof, must be appropriate to the strategy you intend to use to demonstrate that the change is safe. Select one of the more of the following criteria:

(i) Application of Codes of Practice,

(ii) Similarity Analysis with Reference System and/or

(iii) Explicit Risk Estimation.

6.1 Application of Codes of Practice

In this section the proposer is required to justify the use or application of a Code of Practice or Industry Standard as an adequate measure to mitigate the identified risks or hazards which would otherwise not be acceptable if left untreated.

6.2 Similarity Analysis with Reference System

In this section a comparison of the proposed change to a similar change made in the past, which has been authorized by a relevant regulatory body/institution is made and justified as a sufficiently mitigating measure for the identified potential safety risks and hazards.

To be considered a valid reference, but not limited to, a system must:

- have already been proven in-use to have an acceptable safety.
- have similar functions and interfaces as the system under assessment.
- be used under similar operational conditions as the system under assessment.
- be used under similar environmental conditions as the system under assessment.

6.3 Explicit Risk Estimation

Explicit Risk Estimation is a Risk Acceptance Principal method used to evaluate whether the identified safety risk or hazard is at an acceptable level either qualitatively through

This gazette is also available free online at **www.gpwonline.co.za**

use of acceptable methods and techniques or quantitatively through probabilistic studies.

The objective is to perform a comprehensive safety study which would satisfy readers that adequate steps are taken to ensure the potential safety risks or hazards are mitigated to acceptable levels using acceptable.

7. RISK EVALUATION

In this section a verification by the proposer should be performed to ensure that the criterion/criteria chosen through the Risk Acceptance Principle is/are met and/or complied with using one or more of the following methods.

- For a Code of Practice (CoP): assurance that the requirements of the standards are met as well as that the CoP has been correctly applied.
- For a Similar Reference System: assurance that the system is at least as safe as the reference system. In case of deviation from the reference system where a lower safety is reached, then additional safety measures shall be identified to ensure a sufficient overall safety.
- For an Explicit Risk Estimation:
    - Qualitative: Ensure that the qualitative criterion/criteria is/are.
    - Quantitative: ensure that the requirements of the performed safety studies are met.

8. SAFETY REQUIREMENTS

In this section the proposer is required to, by way of demonstration, ensure that safety requirements identified through the Risk Acceptance Principle or combination thereof and risk analysis are met.

Examples of such a demonstration would include, but are not limited to:

- maintenance requirements which are coherent with maintenance strategy in place (or its update).
- Operational requirements are present in the operational procedures.

This gazette is also available free online at **www.gpwonline.co.za**

- Specific organisational structures are to put in place for some categories of personnel…

9. INDEPENDENT ASSESSMENT DECLARATION

In this section the proposer is required to assure the assessor that the entire CSM-RA regulatory tool has been applied correctly in evaluating the proposed change. For significant projects (as confirmed through the *Change Significance Evaluation*, in paragraph 4) this must be audited/checked by an independent person/body.

This portion of the report should be completed by a suitably qualified independent Assessor, registered with the relevant council. The Appointment of this Independent Assessor shall be from Conception phase of the proposed change and will be maintained through all life cycle phases prior to operational phase and handover to the asset owner.

This gazette is also available free online at **www.gpwonline.co.za**

8. ANNEXURE B: MINIMUM SUBMISSION REQUIREMENT

To obtain an Approval/ a "No objection" from the RSR, operators shall make submissions to the RSR through all the Life Cycle Phases (LCP) of the project as listed below:

1. General

Submissions made by Railway Operators shall include the following project details:

a. Company Profile
b. Project Description
c. Project Objectives
d. Location of Project (General Layout)
e. Brief Technology Description
f. Project Plan
g. Interactions – Project Organizational Structure with a list of all the service providers including their roles and responsibilities

2. Concept Phase

The Concept Phase notification submission shall be made to the RSR by the Operator. The RSR shall review the submission and issue a notice of No Objection/Approval provided all requirements/conditions are complied with. The Concept Phase submission to the RSR shall include the following:

a. A project definition and scope description
b. An indication of the design standards to be implemented
c. A robust design change procedure identifying all persons concerned with the Project Team outlining the appropriate roles and responsibilities assigned
d. A project hazard log and risk assessment, managed by a competent person nominated by name and managed by a competent person with the appropriate authority to expedite the completion of corrective or mitigating actions and counter signed by all affected parties
e. Signed approval/consent/acknowledgement letter in principle by relevant Stakeholders (e.g. Train operator, Network operator, Road authorities, Landowners, etc.)

This gazette is also available free online at **www.gpwonline.co.za**

The following is applicable for a new and existing Level crossing application:

a. Level Crossing physical assessment
b. Level Crossing hazard identification and risk assessment
c. Consideration of the existence of any exclusion criteria/requirements as per the latest SANS 3000 2-2-1
d. A traffic impact study (applicable for public Level Crossings)

3. Design Phase

The Design Phase notification submission shall be prepared by the Operator upon receipt of a No Objection notice on the Concept Phase. The submission to the RSR must include the following:

a. A policy deliberate statement of principles to guide decisions and achieve rational outcomes.
b. A User Requirement Specification (URS) document, signed off by the appropriate delegated authority(ies)
c. A project organisational structure and an operational framework guiding decisions document
d. An audit trail substantiated by an organisational management procedure, defining the organisational involvement in the project, be it: define, design, sub-contract, build, integrate, operate, maintain and transfer or any combinations thereof
e. A project purpose definition or functional description
f. Compilation of a risk analysis (RA) and hazard log (HL)
g. Statutory requirements (including environmental) to adhere to or obtained prior to realization of the product.
h. Standards to be used.
i. Product performance evidence envelope (functional, maintainability, reliability, availability)
j. Infra structure requirements (facilities, processes etc.) to sustain the product over the Life Cycle (LC)
k. Development of cost estimation: New Works and Technology Developments Requirements

This gazette is also available free online at **www.gpwonline.co.za**

l. Operator machine interface over the LC leading to ergonomic requirements and work creation and sustainability over the LC
m. Environmental impact assessments of alternatives in terms of the relevant National Legislation
n. Signed approval letter in principle by relevant stakeholders to proceed with designs (e.g. Train operator, Network operator, Road authorities, Landowners, etc.)

Additional considerations for the design phase:

a. Documented evidence of decisions, analysis reports, drawings and motivations of design alternatives including system specifications, standards, process, materials, Integration acceptance, quality assurance (QA) plan, updated RA and HL, compliance or verification checks (or both) as required and cost optimisation analysis to reach best alternative selection
b. Process for procurement if applicable
c. Procedure for technology validation and verification
d. Documented evidence of all rights associated with the implementation of the product.
e. Evidence of a documented change management process which captures all changes in detail design, manufacturing requirements, standards, technology, compliance conditions and impact on the RA, HL and cost optimisation
f. Application of document control system, change management process and notification process for the introduction of new technology
g. Preparation of drawings, revised bill of materials, list of standards that the design is based upon, builder's instructions, project schedules and sub-contractor's business continuity management (Risk Management) compliance certificate
h. New Works and Technology Developments Requirements
i. Generating reports on all type and prototype testing as required by statutory, safety and performance standards adopted including, scope of test, measurement norms, measurement methodology, failure criteria and any variations approved.

This gazette is also available free online at **www.gpwonline.co.za**

j. Specifications and drawings - system drawings, layouts, schematics and specifications for civil, perway, signalling, telecommunications, rolling stock and electrical (OHTE, traction substation, Transmission lines/equipment, etc.) signed off by a registered professional as per ECSA requirements
k. Standards compliance statement and
l. Any requests for derogations to standards and regulations

The following shall be considered for Level Crossings applications:

- Pedestrian traffic patterns and volumes
- The line of sight for pedestrians, road vehicle drivers and train drivers

4. Execution/Manufacturing Phase

The Execution/Manufacturing phase shall not proceed until the RSR has issued an Approval notice on the Design Phase, provided all requirements/conditions are complied with. Notification submissions for the execution/manufacturing, assembly or production phase shall include the following:

a. Proof of Environmental Authorisation where required.
b. A plant, product, or process documentation pack inclusive of:
    - All drawings
    - Bills of Material
    - Manufacturing, assembly, or production assembly execution plans
    - Quality Plans, processes, norms, and methodologies
    - Supply Chain sustainability and competence procedures and
    - Interface agreements with all affected parties
c. Define and implement such procedures required for safe working and certified hand over between sub-system or component groups. Such procedures shall clearly indicate integration and resolution process responsibility.
d. A robust and enforced design change procedure (as required during manufacture/ assembly for which the detail design did not accommodate) shall be in place with sign off from all persons as identified within the project team with the appropriate role & responsibility

This gazette is also available free online at **www.gpwonline.co.za**

e. The project hazard log and risk register shall be current, managed by a competent person with the appropriate authority to expedite the completion of corrective or mitigating actions and counter signed by all affected parties
f. Signed approval letter in principle by relevant Stakeholders to proceed with construction (e.g. Train operator, Network operator, Road authorities, Landowners, etc.)
g. Any deviation from the approved Level Crossing/s design, during construction shall result in a new physical assessment being conducted and the design revised, verified, and validated accordingly and submitted to the RSR for approval
h. Work Method Statement

5. Inspection, Testing and Commissioning Phase

The Inspection, Testing and Commissioning phase shall not proceed until the RSR has issued an Approval notice for the execution/manufacturing phase. Procedures, processes, documents and notification submissions for the Testing and Commissioning phase shall include the following:

a. A Test & Commissioning plan must be in place and be signed off by the relevant role players.
b. The test plan shall cater for asset functionality and asset safety as experienced by operators or users (or both) of the asset or service.
c. The plan shall include the scope, parameters, measures, methodology, norms and acceptance criteria for the asset or system or process or a combination thereof
d. The plan shall define certification contents and signatories for each component, system and sub-system
e. The plan shall be submitted to the RSR for review and issuance of an approval prior to commencement of the ITC phase
f. Where applicable, the Railway Operator shall make a submission to the RSR, in the appropriate format, for a Testing and Commissioning Permit. The RSR will advise on the need for a permit.
g. The Testing and Commissioning entity shall notify the RSR of any intended change or new test requirements after original submission.

This gazette is also available free online at **www.gpwonline.co.za**

h. The hazard log and risk register shall be current, managed by a custodian with the appropriate authority to expedite the completion of corrective or mitigating actions and counter signed by the responsible person
i. Define and implement such procedures required for safe working during execution of the testing and commissioning tests. Such procedures must clearly indicate completion or demarcate areas where other sub-system groups may operate
j. Appropriate certification shall be available and rendered to the RSR for ratification that the system, sub-system or component is fit for use from a safety aspect
k. Certification shall also include correct functional operation of the sub-system if the output of the sub-system is an input to another sub-system and certify that if required the change process was followed to implement a design or manufacturing or assembly change.
l. The Test Engineer Certification (including ECSA registration) and a resume.
m. A comprehensive and complete document pack shall be available for audit which includes all documentation pertinent to the system development excluding any modification or decommissioning or disposal documentation where that has not yet been implemented or initiated

6. Operations Phase

The Operations phase shall not proceed until the RSR has issued an Approval notice for the Testing and commissioning phase. Any envisaged changes to monitoring and maintenance standards, procedures, processes, agreements and associated activities shall require notification submissions to the RSR for consideration and shall include the following:

a. Human resource plan, including recruiting and training plan where applicable.
b. Documented proof of the existence and effectiveness of operational standards, procedures and processes and an audit trail of any change management activities, implementation and training thereof (Note: A competent person must be empowered to manage, sustain and monitor the above)

This gazette is also available free online at **www.gpwonline.co.za**

c. Any change envisaged must be pre-empted with a submission to the RSR and must include the purpose, scope, methodology of implementation, training norms and acceptance criteria and risk assessment for the envisaged change
d. The submission must define certification contents and signatories for the envisaged changes for each system, sub-system or component
e. The submission must be made to the relevant RSR department/unit for review prior to service implementation, in the appropriate format.

NB: Any change effected should consider the following:

- Revised organisational structure, roles and responsibilities and competency impacts.
- Revised processes or procedures
- Impact (risk assessment) of the introduction of new assets, procedures, processes, technology, or service providers
- Level Crossing physical assessment (applicable for new and existing Level Crossing projects) and
- Notification to the RSR of such changes

a. Risk assessments of the operating procedures
b. A hazard log and risk register must be developed for the envisaged changes, kept updated and managed by a custodian with the appropriate authority to expedite the completion of corrective or mitigating actions and counter signed by the assigned competent person.
c. Define and implement such procedures required for safe working during execution of the envisaged changes.
d. Appropriate certification must be available and rendered to the RSR for ratification that the envisaged changes to system, sub-system or component maintenance or monitoring (or both) is fit for use from a safety aspect. Certification shall also include the correct functional operation of the sub-system if the output of the sub-system is an input to another sub-system and certify that if required the change process was followed to implement a design or execution change.

7. Monitoring and Maintenance Phase

This gazette is also available free online at **www.gpwonline.co.za**

Any envisaged changes to monitoring and maintenance standards, procedures, processes, agreements and associated activities shall require notification submissions to the RSR for approval and shall include the following:

a. Documented proof of the existence and effectiveness of the monitoring and maintenance policy, strategy and plan ***(Note: The monitoring plan, parameters and analysis must cater for the system functionality and safety as experienced by operators or users (or both) of the system within the operating environment)***

b. The scope, parameters, measures, methodology, norms and acceptance criteria for the asset or system or process (or a combination thereof)

c. Defined certification contents and signatories for the envisaged changes for each system, sub-system and component

d. Submission made to relevant RSR Department/unit for review and issuance of Approval notice prior to service implementation

e. The Operator shall make the submission to the RSR, in the appropriate format and any change submission shall include the following:
   - Revised organisational structure, roles, and responsibilities.
   - Revised asset management policy, strategy, objectives, and plans
   - Revised processes or procedures (or both)
   - Impact (Risk Assessment) of the introduction of new assets, procedures, processes, technology, or service providers
   - Description of the change including specifications, drawings, or schematics where applicable.
   - Proof of the availability of spares and
   - Proof that the maintenance personnel is trained to maintain the system and operations personnel trained to operate the system

f. A hazard log and risk register shall be developed for the envisaged changes, kept updated and managed by a competent person with the appropriate authority to expedite the completion of corrective or mitigating actions and counter signed by the assigned responsible person.

g. Define and implement such procedures required for safe working during execution of the envisaged changes

This gazette is also available free online at **www.gpwonline.co.za**

h. Appropriate certification shall be available and rendered to the RSR for ratification that the envisaged changes to the maintenance or monitoring (or both) of the system, sub-system or component is fit for use from a safety aspect. Certification shall also include correct functional operation of the sub-system if the output of the sub-system or component is an input to another sub-system and certify that, if required, the change process was followed to implement a design or execution change (or both).

i. A comprehensive and complete document pack shall be available for audit which includes all documentation pertinent to the Rolling Stock development and maintenance excluding any modification, decommissioning or disposal documentation where that has not yet been implemented or initiated

8. Monitoring and Maintenance Phase

Modified systems shall not be put into Operations without an Approval notice from the RSR. Standards and procedures for the control of the process for modification or re-assembly of systems and components shall include consideration for the following:

a. Effects of the proposed modification on the railway system as a whole
b. Effects of the environment on the proposed modification
c. Design, implementation and commissioning of the modification or re-build in accordance with clause 6 to clause 10 (inclusive)
d. Effective recording, promulgation and communication of changes and modifications where especially operational safety is affected

9. Decommissioned/Disposal Phase

Systems shall not be decommissioned/disposed without an Approval notice from the RSR. Standards and procedures for the decommissioning, disposal and means of preventing inappropriate usage after disposal shall be developed. The Railway Operator shall include in their Safety Management System (SMS) as referenced in the SANS 3000-1 Standard, the following as considerations for decommissioning:

e. Appropriate marking of each decommissioned item for identification purposes

This gazette is also available free online at **www.gpwonline.co.za**

f. The movement of decommissioned rolling stock, including rolling stock systems, subsystems or components, and the identification of a person(s) appointed to authorize such movement.
g. Ensuring safe operations during decommissioning, scrapping and disposal
h. Ensuring that the condition of decommissioned material and equipment is clearly identified.
i. Prevention of inappropriate re-use of decommissioned material
j. Minimizing environmental risks, including health, safety and pollution hazards associated with the decommissioned items and the process thereof as well as considering both short-term and long-term impact:
   - Description and identification of assets involved.
   - Disposal strategy and plan including environmental considerations.
   - Complete risk assessment including socio economic, environmental and statutory impacts or requirements.
   - Safe working operations during disposal
k. The Railway Operator shall make a submission of intent to the RSR that must include the following:
   - All required certification, signed off by a competent person, that the disposal is compliant to all statutory or other requirements
   - Updated operator asset register.

Configuration Management

Where new technology is introduced, a submission of such intent shall be made to the relevant RSR department/unit in the required format provided by the RSR, which include the following:

- Description of the technology including schematics, drawings, and specification sheets
- Standards to which the technology is compliant.
- Scope of the technology impact with associated risk assessment
- Test & Commissioning and implementation plan, and
- Proof of training maintenance team/employees on the maintenance of the new asset technology installed (*Could be*

This gazette is also available free online at **www.gpwonline.co.za**

employees in the organization or a contractor to conduct maintenance when required)

- Risk assessments to be conducted per phase.

This gazette is also available free online at **www.gpwonline.co.za**

9. ANNEXURE C: LIST OF SUPPORTING DOCUMENTS

This gazette is also available free online at **www.gpwonline.co.za**