



SPAD GUIDELINE ON SAFETY AND HEALTH MANAGEMENT SYSTEM

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1.0 TERMINOLOGIES, ABBREVIATIONS & DEFINITIONS

1.1 The terminologies (or “term”) and abbreviations used throughout this document are defined below:

- DOSH - Department of Occupational Safety and Health, Malaysia
- ERP - Emergency Response Plan
- ISO - International Organization for Standardization
- LPT - Land Public Transport
- MS - Malaysia Standard
- NTC - National Transport Commission, Australia
- RSSB - The Rail Safety and Standard Board, UK
- SMS - Safety and Health Management System
- SPAD - Suruhanjaya Pengangkutan Awam Darat

1.2 The definitions used throughout this document are interpreted below:

- Accident - An accident attended by loss of human life or grievous hurt to any member of the public, railway passenger or persons engaged in the working or driving of railway trains or by serious damage to goods carried on the railway or property or an accident of such a description as is usually attended by such a loss, hurt or damage (Land Public Transport Act 2010, Section 146).
- Audit - A systematic and independent examination to determine whether the procedures specific to the requirements of a product comply with the planned arrangements, are implemented effectively and are suitable to achieve the specified objectives.
- Availability - The ability of a product to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval assuming that the required external resources are provided.
- Commissioning - A collective term for the activities undertaken to prepare a system or product prior to demonstrating that it meets its specified requirement.
- Competent - The combination of training, skills, experience and knowledge that a person has and their ability to apply them to perform a task safely.



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- Continual Improvement - The iterative process of enhancing the SMS to achieve improvements in the overall safety performance.
- Corrective Action - Action to eliminate the cause of a detected nonconformity or other undesirable situations.
Notes:
 i. There can be more than one cause of a nonconformity; and
 ii. Corrective action is taken to prevent recurrence whereas preventive action is taken to prevent occurrence.
- Emergency - A current unforeseen or unplanned event which has life threatening or extreme loss implications and requires immediate attention.
- Hazard - A source, situation or act with a potential for harm in terms of human injury or ill health and damage to property.
- Incident - An unplanned, undesired event that hinders completion of a task and may cause injury, illness, or property damage or some combination of all three in varying degrees from minor to catastrophic.
- Preventive action - Action to eliminate the cause of a potential nonconformity or other undesirable potential situation.
- Railway - Means any kind of railway for the public carriage of passengers or goods or both, or any portion thereof, and includes -
 a) all rails beams, cables, sidings, or branches worked over for the purpose of, or in connection with, a railway;
 b) all rolling stock used for the purposes of traffic;
 c) in so far as the context allows, a railway under construction by or for any railway company; and
 d) any guided system or guided system of class prescribed to be a railway for the purpose of the Land Public Transport Act 2010.
- Railway company - Includes any person or persons, whether incorporated or not, who are the owners or lessees of railway or parties to an agreement for working a railway (Land Public Transport Act 2010, Section 2).
- Railway construction and operation - These include:
 ▪ the construction of a railway, railway tracks, and associated railway track structures;
 ▪ the construction of rolling stock;
 ▪ the management, commissioning, maintenance, repair, modification, installation, operation, or decommissioning of rail infrastructure; and
 ▪ the commissioning, use, modification, maintenance, repair, or decommissioning of rolling stock.



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- Risk - A combination of the likelihood of an occurrence of hazardous event or expose with specified period or in specified circumstances and the severity of injury or damage to the health of people, property, environment or any combination of these caused by the event or exposure.
- Rolling stock - Includes tenders, motors, coaches, trains, wagons, trucks, trolleys, carriages of any kind and locomotive and other kinds of engine used on a railway (Land Public Transport Act 2010, Section 2).
- Safety - Freedom from unacceptable risk of harm.
- Safety and Health Management System - The organization, arrangement and procedures established by Railway company to ensure the safe management of its activities in relation to railway.
- Safety and health performance - Measurable results of A Railway company's management of its safety and health risks.
- Shall - Indicates a mandatory requirement.
- Should - Indicates a recommendation or that which advised but not required.
- System lifecycle - The activities occurring during a period of time that starts when a system is conceived and ends when the system is no longer available for use, is decommissioned and is disposed.
- Validation - Confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use have been fulfilled.
- Verification - Confirmation by examination and provision of objective evidence that the specified requirements have been fulfilled.



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2.0 PURPOSE OF GUIDELINE

The purpose of this document is to provide guidance to railway company in managing safety and health in railway.

3.0 INTRODUCTION

Safety and Health Management System (SMS) is a strategic and operational decision made by Railway company to create a working environment that is safe for everyone with minimal impact on the environment. There are several integral factors which determine the effectiveness of SMS implementation in order for the system to meet its objectives, and the factors include:

- Full commitment from top management and leadership in developing, embracing and consistently promoting safety and health culture in the workplace;
- Involvement of workers at all levels;
- Constant consultation and communication processes;
- Sufficient allocation of resources to ensure its sustainability;
- Aligned safety and health objectives with safety and health policies which are compatible with the overall strategic objectives and direction of the organization to reflect the organization's commitment in managing safety and health hazards and risks;
- Integration of SMS into the organization's business processes;
- Continual evaluation and monitoring of SMS on a regular basis to improve safety and health performance;
- Awareness of its applicable legal requirements and other requirements; and
- Identify safety hazards, processes, effective risk control and leveraging on safety and health opportunities.

The system provides a systematic way to identify hazards and control risks to an acceptable level while maintaining assurance that these risk controls are effective. The SMS elements, principally derived from PDCA cycle (Plan-Do-Check-Act), which is one of the common approaches used by all international standard management systems such as ISO 9001, OHSAS 18001 etc.

Generally, the SMS has 5 main elements that interacting each element to form a complete management system cycle such as follows (refer **Figure 1: SMS Cycle**):

- Policy and commitment
- Organizing
- Planning and implementation
- Evaluation
- Action for improvement

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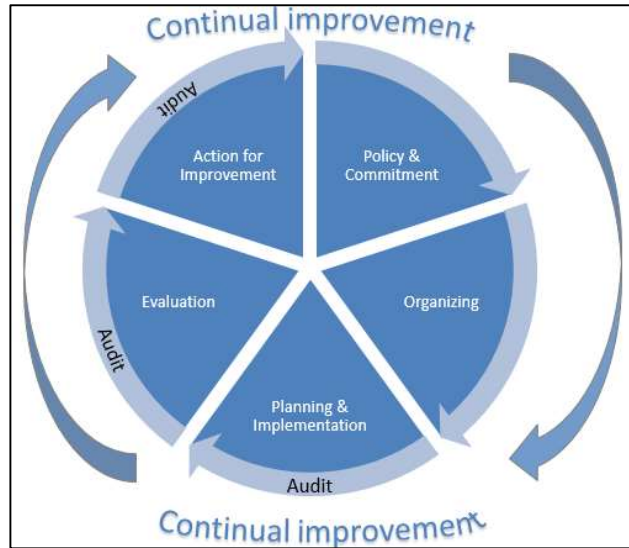


Figure 1: SMS cycle

Each main element has several sub-elements to support, complete and interact with other elements and sub-elements as per **Figure 2: SMS elements and sub-elements**.

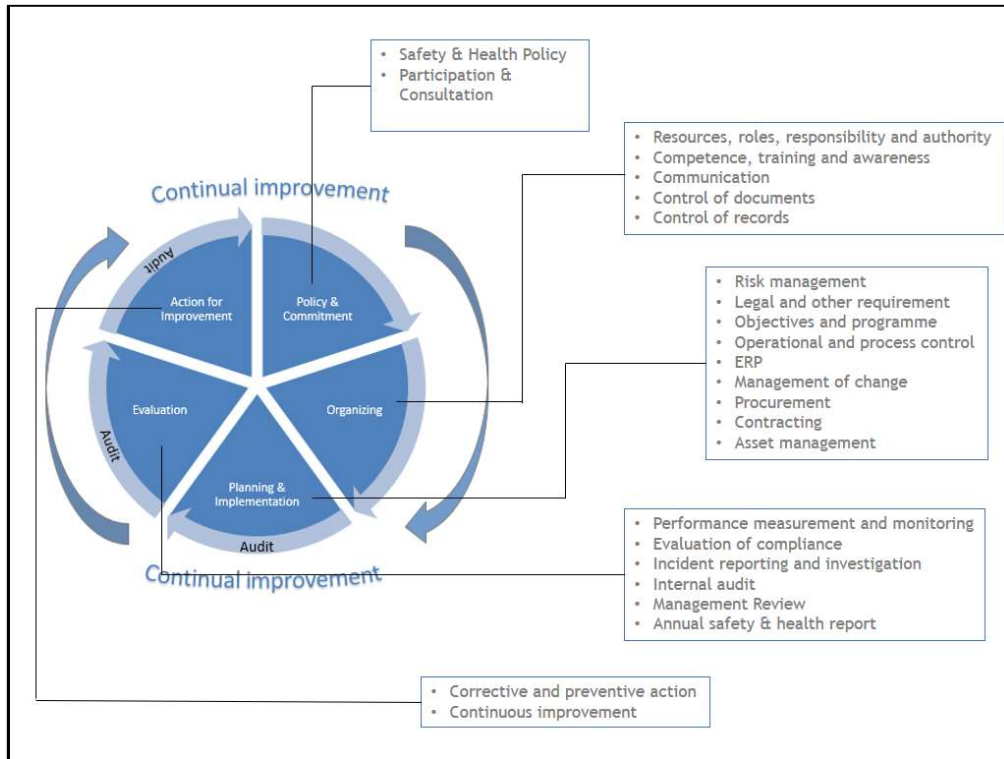


Figure 2: SMS elements and sub-elements



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4.0 DETAILS OF GUIDELINE

4.1 Safety and Health Policy

The SMS shall include a safety and health policy that:

- a) is endorsed by top management;
- b) include a commitment to develop and maintain the SMS and commitment to continuously improve all aspects of SMS;
- c) provide leadership and commitment to:
 - protect the safety and health of public, passengers, workers or others who may be affected by the business activity;
 - prevent all accidents and incidents;
 - comply with related laws and regulations, other related requirements; and
 - continually improve the performance of the SMS.
- d) concise, clearly written, dated and made effective;
- e) reviewed regularly for continuous improvement and to ensure that the policy is relevant and suitable; and
- f) made available to interested parties upon requests, as the management deems fit for circulation and distribution.

The SMS shall address the processes involved in communicating the safety and health policy and safety and health objectives to everyone who are required to participate and be part of the SMS implementation.

4.2 Participation and Consultation

A railway company shall undertake consultation process prior to establishing or varying SMS. The Railway Company shall establish, implement and maintain procedure(s) to ensure participation and consultation on safety and health occurs within the organization. It shall be undertaken with person(s) who:

- a) involve in carrying out the work operation (e.g. railway construction and operation, work at the rail operator's railway premise, involve with rolling stock);
- b) likely to be affected by the review or variation of SMS;
- c) safety and health representatives / committee within the meaning of occupational safety and health legislation representing any of these people or entities (refer to Occupational Safety and Health Act 1994 (Act 514));
- d) representing any other rail operator with whom the rail operator has an interface co-ordination plan relating to risk to safety of railway operations carried out by or on behalf of either of them; and/or
- e) representing the public as appropriate.

4.3 Resources, Roles, Responsibility and Authority

A railway company shall organize its resources and assign the relevant responsibilities, accountability and authority to undertake and oversee the following tasks:

- a) The development of SMS;



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- b) Implementation of SMS (e.g. initiates action, recommend or provide solutions to prevent incidents and verify the implementation);
- c) Promotion of safety and health program, including awareness programs;
- d) Ensure sustainability of SMS in the organization (e.g. management review, reporting of accident);
- e) Ensure successful performance of SMS; and
- f) Ensure achievement of the relevant safety and health objectives.

The roles and functions of employees in relation to safety and health must be clearly defined, documented and consistently communicated by the railway company.

4.4 Competence, Training and Awareness

A railway company shall establish, implement and maintain procedure(s) to ensure all persons are competent to carry out the safety and health aspects of their duties and responsibilities. The procedure shall include:

- a) identification of gaps through training needs analysis with steps to be taken to address the gap and enhance competencies of the relevant employees;
- b) consideration on level of risk, literacy and the language skills of trainees; and
- c) keeping and tracking of training and assessment records.

Note:
Please refer to SPAD Guideline on Industry Staff Competence (SPAD/GL/RD/RAIL/010/Rev0) or its latest revision.

4.5 Communication

A railway company shall establish and maintain procedure(s) to ensure effective communication of safety and health information is disseminated to the respective parties or levels in organization including visitors, vendors and contractors. It shall include:

- a) reporting of safety and health risks by personnel with safety and health responsibilities; and
- b) communication of change management to all affected parties in organization.

4.6 Control of Documents

A railway company shall establish, implement and maintain procedure(s) to control all documents required by SMS and it shall include:

- a) safety and health related documents to be reviewed to ensure adequacy and approved for prior to distribution for implementation. The documents shall also to be identified with the current revision status and made available during point of use;
- b) obsolete documents and records must be clearly identified accordingly to prevent unintended use of the said documents;
- c) all safety and health related documents must be kept in a systematic way to ensure their traceability and accessibility. The documents must be kept within



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- the retention period in an appropriate environment to prevent damage and loss of documents;
- d) any changes to documents must be tracked, reviewed and approved accordingly; and
 - e) exchange of information available to the third party.

4.7 Control of Records

A railway company shall establish, implement and maintain procedure(s) for record control required by SMS and it shall include:

- a) records shall be kept in such a way that they are accessible, traceable and kept within the retention period established in an appropriate environment to prevent damage and loss of records; and
- b) records shall be legible and continue to remain legible, identifiable and traceable.

4.8 Risk Management

A railway company shall establish, implement and maintain procedure(s) on risk management and it shall include:

- a) ensure risks are identified, assessed and eliminated or controlled;
- b) closed-loop hazard tracking system;
- c) safety and health risks for all related phases of railway systems lifecycle but not limited to as follows: -
 - specific to work operations together with interfacing issues (e.g. railway operation with interfacing system and sub-system issues, construction work with a public road or public properties);
 - specific to machineries (e.g. crane, rolling stock, shunting vehicle);
 - specific to geographic areas;
 - specific to infrastructure features (e.g. tunnel, bridges, underground stations);
 - specific to particular work group (e.g. passengers, workers, public);
 - specific to human factor;
 - arise from normal operations, abnormal/emergency operations, maintenance, planned changes, any non-routine work or activities from third party;
 - arise cumulatively, which involves numbers of hazards or a chain event or arise concurrently;
- d) systematic approach and comprehensive to cover all organizational activities;
- e) analyze either quantitatively or qualitatively and reflect the complexity of the system;
- f) monitoring, reviewing and revising the adequacy of controls (e.g. framework of managing risk accordance to ISO 31000:2009); and
- g) recorded in the risk register that include the following information:
 - List of safety and health risks identified;
 - Details of assessment of the risks (including the probability, severity and ranking);
 - Risk control measures for managing identified risks (e.g. including person-in-charge to implementing the measures); and
 - Last date of review and revision of the risk register.



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Note:
For risk related to interfacing issues, please refer to SPAD Guideline on Interface System Safety (SPAD/GL/RD/RAIL/012/Rev0) or its latest revision.

4.9 Legal and Other Requirements

A railway company shall establish, implement and maintain procedure(s) to identify and assess the applicable legal and other requirements in relation to safety and health and it shall:

- a) be communicated within the organization and other relevant parties;
- b) be kept up-to-date; and
- c) be used as external and internal context for preliminary steps in conducting risk assessment.

4.10 Objectives and Program

A railway company shall establish safety and health objectives at relevant functions and levels to maintain and improve the SMS. The safety and health objectives shall:

- a) consistent with the established safety and health policy;
- b) relevant, realistic and measurable;
- c) consider preventing incidents and accidents;
- d) consider applicable legal and other requirements;
- e) consider its technological options, financial, operational and business requirements;
- f) consider input from risk management;
- g) consider information and evaluation of SMS effectiveness, such as results from audit findings;
- h) consider previous performance and achievement;
- i) consider results from management review; and
- j) periodically evaluated and updated, as and when required.

Program(s) shall be established, implemented and maintained to meet the safety and health objectives and include:

- designation of responsibility and authority for achieving objectives at relevant functions and levels within the organization; and
- the means and time-frame by which the objectives are to be achieved;

Note:
Please refer to SPAD Guideline on Workforce Health Program (SPAD/GL/RD/RAIL/014/Rev0) and SPAD Guideline on Workforce Safety Program (SPAD/GL/RD/RAIL/013/Rev0) or its latest revision.



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4.11 Operational and Process Control

A railway company shall establish, implement and maintain procedure(s) to manage and control operations and processes within the organization, including the business activities. There are fundamental procedures that should be established for SMS to ensure effectiveness of the system such as:

- a) procedure for security management;
- b) procedure for control and verification of the design of structures, rolling stock, equipment, systems and interfaces in accordance with the engineering standards and operational systems safety standards;
- c) procedure on the engineering design of rail infrastructure and rolling stock;
- d) procedure of construction and installation of rail infrastructure and rolling stock;
- e) procedure on implementation and commissioning of rail infrastructure and rolling stock;
- f) procedure on monitoring and maintenance of rail infrastructure and rolling stock;
- g) procedure for system operation of rail infrastructure and rolling stock;
- h) procedure on modification of rail infrastructure and rolling stock;
- i) procedure for decommissioning or disposal of rail infrastructure and rolling stock;
- j) procedure to control, calibration and maintenance of all equipment used to inspect or test rail infrastructure or rolling stock;
- k) procedure of inspection and testing of safety related engineering and operational systems;
- l) procedure on interface coordination and control for system operation of rail infrastructure and rolling stock; and
- m) procedure on interface coordination and control for construction and installation of rail infrastructure and rolling stock.

4.12 Emergency Response Plan (ERP)

A railway company shall establish, implement and maintain procedure(s) for emergency prevention, preparedness, response and recovery that:

- a) identify potential risks for accidents and emergency situations;
- b) identify potential risk of safety and health arising from the emergencies;
- c) include methods to mitigate safety and health risks and other risks associated with them;
- d) include initial response procedures for dealing with emergencies and provisions of rescue services;
- e) include liaison with external emergency services and other bodies, where applicable;
- f) include site security and preservation of evidences;
- g) include recovery procedures for the restoration of business operations;
- h) include assistance to affected people due to emergencies;



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- i) include periodic tests where practicable; and
- j) include periodic review and where necessary, revise after periodic testing and occurrence of emergency situations.

4.13 Management of Change

A railway company shall establish, implement and maintain procedure(s) to ensure changes that may affect safety and health of railway construction and operation are identified and managed. It shall include:

- a) review of SMS documentation;
- b) review of organizational system;
- c) review in regulatory compliance;
- d) review in risk management;
- e) consideration on technological changes;
- f) communication within organization on changes and training; and
- g) evaluation on impact of safety and health arising from internal and external changes together with the appropriate preventive steps taken prior to changes.

Note:

Please refer to SPAD Guideline on Management of Change (SPAD/GL/RD/RAIL/016/Rev0) or its latest revision.

4.14 Procurement

A railway company shall establish, implement and maintain procedure(s) for controlling the process of procurement and it shall include:

- a) goods and services provided are of an appropriate standard and specification to ensure safety and health of railway construction and operations; and
- b) identify and comply with SMS requirement (e.g. legal and other requirements);

4.15 Contracting

A railway company shall establish, implement and maintain procedure(s) for SMS requirements being met under contract(s) and it shall include:

- a) goods and services provided are of an appropriate standard and specification to ensure safety and health of railway construction and operation;
- b) identify and comply with SMS requirements (e.g. legal and other requirements);
- c) involve pre-contract activities that review of tender documents and contracts do not lead to unsafe work or an activity that may affect the railway construction and operations;
- d) include procedure on control of contractors and performance monitoring in relation of safety and health aspects (e.g. regular performance review);



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- e) verification of supplying products or services to meet railway construction and operation's safety and health requirement (e.g. safety critical equipment); and
- f) action to be taken if safety and health requirements are not being met and fulfilled.

4.16 Asset Management

A railway company shall establish, implement and maintain procedure(s) for managing safe operations of assets and it shall include:

- a) apply risk management approach for each stage of the asset lifecycle;
- b) track any changes made to the assets (functional and physical) during the lifecycle;
- c) use of risk-based approach to identify the failure of assets and the impact of the failure;
- d) processes shall be clearly identified, accountability, authority and serviceability are clearly defined, safety standards are controlled;
- e) allocation of resources throughout assets' lifecycle; and
- f) identify and allocate competency within the organization.

Note:
Please refer to SPAD Guideline on Asset Infrastructure Safety (SPAD/GL/RD/RAIL/011/Rev0) or its latest revision.

4.17 Performance Measurement and Monitoring

Arrangement(s) shall be made for a periodic review on Railway company's safety and health performance and it shall include:

- a) clearly defined responsibility, accountability and line of authority for monitoring at different levels within the organization;
- b) performance to include active and reactive monitoring;
- c) include indicators to measure performance of key risk controls; and
- d) procedure to collect, analyzes, assess and disseminate of safety and health information.

The outcome of monitoring and measurement shall provide:

- feedback on safety and health performance;
- information to determine whether the day-to-day arrangements for hazard and risk identification, prevention and control are in place and operating effectively; and
- to be used as a means of determining the extent to which safety and health policy and objectives are being implemented and risks are controlled.



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4.18 Evaluation of Compliance

A railway company shall establish, implement and maintain procedure(s) to evaluate:

- design compliance;
- manufacturing compliance;
- environmental compliance;
- construction compliance; and
- operation and maintenance compliance;

to the applicable legal and other requirement. It shall include:

- a) records of the result of evaluations to be kept;
- b) evaluation to be conducted periodically; and
- c) output of evaluation to be used for planning of safety and health programs.

Note:

Please refer to SPAD Guideline on Construction Compliance (SPAD/GL/RD/RAIL/015/Rev0) or its latest revision.

4.19 Incident Reporting and Investigation

A railway company shall establish, implement and maintain procedure(s) to notify, investigate, analyze and document all incidents and accidents. It shall include:

- a) notify all incidents and accidents to the employer and/or the relevant authorities;
- b) notify and report in a timely manner (e.g. accordance with legal requirements);
- c) management of scene and evidence preservation;
- d) investigation to be conducted as soon as possible;
- e) the result of the investigation to be communicated to the safety and health committee in order to propose appropriate recommendations;
- f) investigation to determine root cause of incidents or accidents, corrective action and preventive action required to prevent recurrences and opportunities for improvement;
- g) time frame for action(s) to be implemented; and
- h) implementation of action to be verified as recommended.

4.20 Audit

A railway company shall establish, implemented and maintained procedure(s) to conduct periodic audit to ensure SMS elements are in place, adequate and effective. It shall include:



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- a) identify audit objectives, criteria and scope of audit that cover all areas and activities in SMS;
- b) audit program includes audit scope, methodology and reporting;
- c) conducted by the competence of auditor;
- d) the result of audit and conclusion to be communicated to responsible parties for corrective action(s);
- e) review of audit program(s) effectiveness;
- f) verify and follow up on corrective action; and
- g) time frame for the action to be implemented;

4.21 Management Review

A railway company shall review SMS to ensure its suitability, adequacy and effectiveness. It shall include:

- a) the effectiveness of SMS is assessed through safety and health performance and monitoring;
- b) the effectiveness of any revisions that are made as a result of the last review are assessed;
- c) recommendation or issue arising during an audit or investigation;
- d) deficiencies in the system are identified; and
- e) status and update of corrective and preventive action from audit, investigation and evaluation of legal compliance;

4.22 Annual Safety and Health Report

A railway company shall provide an annual safety and health report that contain the following:

- a) safety and health target and safety and health performance/outcome for the year;
- b) safety and health programs conducted to meet safety and health targets and method of monitoring the progress towards achieving the safety and health targets for the year;
- c) summary of audit report of the year;
- d) minutes of meeting of management review for the year inclusive of changes made for the year;
- e) safety and health target for the following year;
- f) safety and health programs to be conducted to meet the safety and health targets and method of monitoring the progress towards achieving the safety and health targets for the following year;

The safety and health target shall be focusing at least on the key risk areas of:

- Employees and contractor safety and health;
- Passenger and public safety and health;
- Operational and system safety; and
- Other key risk area identified through risk assessment.



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The annual safety and health report shall be provided to SPAD every year on or before **31st of March**.

4.23 Corrective and Preventive Action

A railway company shall establish, implement and maintain procedure(s) to ensure effective arrangement for corrective and preventive action resulted from audit, incident and accident investigation reports, safety and health performances, monitoring and management review. It shall include:

- a) identify and analyze the root-cause of non-conformities with relevant applicable legal and other requirements;
- b) review potential problems and decide appropriate control measures to stop a problem from occurring. If control measure inadequate, new control measures need to be implemented;
- c) to respond in a timely manner;
- d) assignment of responsibilities for corrective and preventive actions; and
- e) giving priority of the corrective action to the matters that representing the greatest risk.

4.24 Continual Improvement

The railway company shall continually improve the suitability, adequacy and effectiveness of SMS to:

- a) prevent the occurrence of incidents and nonconformities;
- b) promote a positive safety and health culture; and
- c) enhance safety and health performance.



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5.0 OTHER RELATED DOCUMENTS

This guideline must be read together with the following documents:

- i. SPAD Guideline on Industry Staff Competence (SPAD/GL/RD/RAIL/010/Rev0)
- ii. SPAD Guideline on Asset Infrastructure Safety (SPAD/GL/RD/RAIL/011/Rev0)
- iii. SPAD Guideline on Interface System Safety (SPAD/GL/RD/RAIL/012/Rev0)
- iv. SPAD Guideline on Workforce Safety Program (SPAD/GL/RD/RAIL/013/Rev0)
- v. SPAD Guideline on Workforce Health Program (SPAD/GL/RD/RAIL/014/Rev0)
- vi. SPAD Guideline on Construction Compliance (SPAD/GL/RD/RAIL/015/Rev0)
- vii. SPAD Guideline on Management of Change (SPAD/GL/RD/RAIL/016/Rev0)

6.0 REFERENCES

This guideline was made by referring to the following documents:

- i. EN 50126: Railway applications - The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS).
- ii. Guidelines on Occupational Safety and Health Management systems, DOSH 2011.
- iii. Land Public Transport Act 2010, Malaysia.
- iv. MS 1722: 2011 Occupational Safety Management System.
- v. OHSAS 18001:2014, International Organization for Standardization Railway
- vi. Safety Management System Guideline, NTC Australia 2015.
- vii. Safety Management System: moving beyond compliance, RSSB 2011.