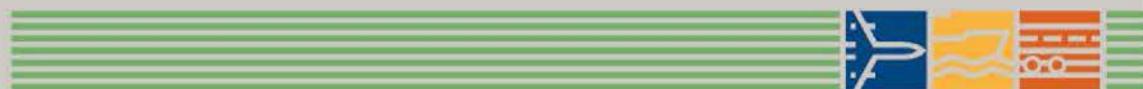




Transport
Canada

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Safety Management Systems Industry Guide



Canada

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About this guide

This guide describes regulatory objectives and provides explanations, guidance and examples to help railway companies and local railway companies develop and implement their railway safety management systems (SMS) to meet the requirements of the *Railway Safety Management System Regulations, 2015* (Regulations). **The examples provided are for guidance purposes only.** Oversight will be conducted against the requirements of the Regulations.

Notes:

- Using this document and the samples it contains is not mandatory
- Nothing in this document replaces the Regulations

Introduction

What is a Safety Management System?

A SMS is a formal framework for managing risk. It makes safety part of day-to-day railway operations.

A SMS helps companies manage the safety of their operations by requiring them to:

- identify safety concerns, assess the level of risk they represent, and take steps to reduce those risks where required;
- build a safety culture in day-to-day operations at all levels of the company;
- involve company employees by:
- collaborating or consulting with them;
- informing them of risks and how the company has dealt with these risks; and
- developing a procedure for employees to report contraventions and safety hazards to the company, and a policy for protecting employees who report contraventions and safety hazards.

SMS has become an international standard for managing safety. It can improve safety effectiveness and efficiency because it:

- promotes accountability and timely remedial actions in the management of safety, without Transport Canada prescribing one-size-fits-all requirements;
- enables companies to be more proactive by leveraging operational expertise to identify hazards, and assessing and reducing risks; and
- enables measures to be taken to reduce risks that may exceed regulatory standards.

SMS complements but does not replace the existing, robust railway safety regulatory and oversight framework. Companies must continue to meet *Railway Safety Act* requirements and associated regulations, rules and engineering standards. SMS can enhance safety by companies managing safety risks before Transport Canada intervenes, and before major railway safety issues emerge.

Purpose

The purpose of the Regulations is to establish the minimum requirements for a SMS that a company **must develop and implement** for the purpose of achieving the highest level of safety in its railway operations.

Style of the Regulation

Both the 2001 and 2015 Regulations differ from traditional prescriptive regulations because they focus primarily on management-based requirements. While the 2015 Regulations contain a series of clear rules of conduct and increased prescription, companies have the flexibility to adapt the system to their operations and find the most efficient and effective solution to continually improve safety.

The Regulations are a hybrid regulation with both prescriptive and management-based requirements.

Prescriptive regulations outline how to achieve a result. For example, a prescriptive regulation for perimeter fencing might require a company to *install a fence 8 feet high*. Not only would the requirement be clear to the company but evidence of its compliance would be obvious to the regulator. However, this type of regulation does not encourage, and may even restrict, innovative solutions.

Management-based regulations require regulated entities to develop and implement systems or processes designed to bring about a public policy objective. For example, *a company must include a procedure for reporting a railway occurrence to company management*. The regulation requires the company to develop and implement the procedure but allows for flexibility in determining the most appropriate procedure to implement based on company-specific factors.

Oversight of management-based regulations is more complex than prescriptive regulations, because inspectors determine compliance by assessing if the expected system (i.e. procedure or program) has been developed (exists) and was put in place (implemented). In some cases, Transport Canada will assess whether or not the system is effective in achieving a regulatory objective (i.e. *a company must ensure that employees have certain knowledge*).

Performance-based regulations focus mainly on the desired outcome or result, and set the standard to meet. In other words, the regulation defines the objective but not how to achieve it. For example, *the gate arm of a warning system must descend to the resting horizontal position in 10 to 15 seconds*.

Requirements

Companies must develop and implement a SMS that includes the following processes:

Applies to: Railway Company	Applies to: Local Company operating on main track	Applies to: Local Company operating on non-main track
Process for accountability To designate an executive who is responsible for the operations and activities of the company to be accountable for the extent to which the company meets regulatory requirements for SMS, including the effectiveness in achieving the highest level of safety in its railway operations.	Process for accountability To designate an executive who is responsible for the operations and activities of the company to be accountable for the extent to which the company meets regulatory requirements for SMS, including the effectiveness in achieving the highest level of safety in its railway operations.	
Process with respect to a safety policy To create a policy that reflects the company's commitment to promoting railway safety.	Process with respect to a safety policy To create a policy that reflects the company's commitment to promoting railway safety.	Process with respect to a safety policy To create a policy that reflects the company's commitment to promoting railway safety.
Process for ensuring compliance with regulations, rules and other instruments To provide a framework for identifying legal obligations, monitoring changes to them, and verifying compliance with them.	Process for ensuring compliance with regulations, rules and other instruments To provide a framework for identifying legal obligations, monitoring changes to them, and verifying compliance with them.	Process for ensuring compliance with regulations, rules and other instruments To provide a framework for identifying legal obligations, monitoring changes to them, and verifying compliance with them.
Process for managing railway occurrences To establish procedures for reporting and reviewing railway occurrences.		
Process for identifying safety concerns To conduct analyses to identify safety concerns, including trends or repetitive situations.	Process for identifying safety concerns To conduct analyses to identify safety concerns, including trends or repetitive situations.	Process for identifying safety concerns To conduct analyses to identify safety concerns, including trends or repetitive situations.
Risk Assessment process To conduct risk assessments to identify risks and required remedial action.	Risk Assessment process To conduct risk assessments to identify risks and required remedial action.	Risk Assessment process To conduct risk assessments to identify risks and required remedial action.
Process for implementing and evaluating remedial action To ensure that the remedial action for treating an identified risk is implemented and that the effectiveness of the action be evaluated.	Process for implementing and evaluating remedial action To ensure that the remedial action for treating an identified risk is implemented and that the effectiveness of the action be evaluated.	Process for implementing and evaluating remedial action To ensure that the remedial action for treating an identified risk is implemented and that the effectiveness of the action be evaluated.
Process for establishing targets and developing initiatives To establish targets and develop related initiatives to achieve those targets each calendar year.	Process for establishing targets and developing initiatives To establish targets and develop related initiatives to achieve those targets each calendar year.	
Process for reporting contraventions and safety hazards To provide a framework for employees to report contraventions and safety hazards without fear of reprisal for having reported.		
Process for managing knowledge To ensure that employees and non-employees have the knowledge they need, and that employees have the skills and qualifications they need, to carry out their duties or activities safely.		
Process with respect to scheduling To apply the principles of fatigue science when scheduling the work of the employees who work certain schedules.		
Process for continual improvement of the SMS To conduct internal monitoring and audit activities to monitor and evaluate the implementation and effectiveness of the SMS.	Process for continual improvement of the SMS To conduct internal monitoring and audit activities to monitor and evaluate the implementation and effectiveness of the SMS.	

The Regulations establish detailed requirements for each process, including actions companies must take and the procedures, plans and methods to develop and implement. Companies must also maintain an up-to-date index listing all their:

- processes;
- associated procedures, plans and methods; and
- positions in the company that are responsible for developing and implementing those processes, procedures, plans and methods.

Transport Canada's oversight philosophy

Transport Canada's SMS Railway Safety Inspectors will conduct two different types of oversight. They will:

1. verify a company's compliance with the Regulations; and,
2. assess a company's system to make sure all system components work together as intended, to meet the objective of the Regulations (i.e. continually improve the safety of the company's railway operations).

Transport Canada may apply a range of enforcement actions in the event of non-compliance with the Regulations (i.e. letter of non-compliance, administrative monetary penalty).

Where to find more information

Transport Canada Rail Safety personnel are available to provide support and advice. Railway companies and local railway companies may contact Transport Canada regional offices at the following numbers:

- Pacific Region: 604-666-0011
- Prairie and Northern Region: 204-983-5969
- Ontario Region: 416-973-9820
- Quebec Region: 514-283-5722
- Atlantic Region: 506-851-7040

For general information regarding [Transport Canada's Rail Safety Program](#) visit:

<https://www.tc.gc.ca/eng/railsafety/menu.htm>

For [general inquiries to headquarters](#):

Email: RailSafety@tc.gc.ca

Phone: 613-998-2985

Toll-free: 1-844-897-RAIL (1-844-897-7245)

Fax: 613-990-7767

Overview of the Regulations

Scope of application

The Regulations establish the minimum SMS requirements a company must develop and implement for the purpose of achieving the highest level of safety in its railway operations. The scope of application is divided into three categories of companies within the Regulations with the list of processes to develop and implement established at the beginning of the corresponding Part or Division:

- Railway companies: section 5

- Local railway companies - main track: section 40
- Local railway companies - non-main track: section 68

Notes:

- When the Regulations use the term “*Main track*”, they mean a line of federal track on which the movement of railway equipment is authorized by a federal railway company. This definition is slightly different than that contained in the *Canadian Railway Operating Rules* (CROR).
- The definitions in the Regulations reflect current industry understanding and practices. The reference to “authorized” in the definition of “main track” is meant to distinguish between:
 - yard limits, cautionary limits and train movements governed under CROR Rule 105; and
 - the requirement that the operator, when entering a main track, has authority from the Rail Traffic Controller (signal, track occupancy permit or clearance).
- When the Regulations use the term “*Non-main track*”, they refer to a line of railway other than main track that includes sidings and rail yards.
- The two categories of local railway companies were designed to align compliance costs with underlying risks to ensure that costs disproportionate to risk were not imposed on small businesses.
- A distinction between main track and non-main track was used to clarify the area of highest risk.

Development and implementation of processes

The detailed expectations for developing and implementing each required SMS process are outlined in the sections of the regulations that correspond to each process:

- Railway companies: Part 1, sections 4-38
- Local railway companies – main track: Part 2, Division 1, sections 39-66
- Local railway companies - non-main track: Part 2, Division 2, sections 67-86

The Regulations also include requirements that a company develop and implement:

- **procedures** that establish a step-by-step sequence of activities for dealing with certain matters;
- **methods** that are not necessarily a step-by-step sequence of activities but establish the manner in which certain evaluations, verifications or supervisory activities are to be carried out; and
- **plans** that establish the proposed time for carrying out certain activities with respect to the consultation and knowledge management requirements, and the proposed manner in which those activities are to be carried out.

When conducting oversight, Transport Canada will use the details in the applicable sections of the Regulations to determine if a company has developed and implemented each required process. For example, section 13 outlines the requirements for a process to identify and analyze safety concerns while section 14 prescribes the need for a procedure to analyze safety concerns.

Sample Template: Procedure

(Sample illustrates proposed format and what type of information would be included in each section of the procedure.)

Company name	Title of the procedure			
	Issue Date	Pages	Revision	Number
		8 of 57	1	XXX

1. Purpose

This section will define what the procedure is to communicate (i.e. define a method for reviewing and updating the list of regulatory instruments).

2. Scope

What/who does this procedure apply to with any reasonable exclusions specified (i.e. this procedure is applicable to the regulatory instruments list, as specified in the SMS Regulations, 2015, and excludes any and all instruments not under the jurisdiction of the *Railway Safety Act*).

3. Definitions and Abbreviations

Any definitions specific to this process should be listed (i.e. regulatory instrument; *Railway Safety Act*).

4. Positions Involved/Responsibilities

Identify positions, not departments, involved in this procedure to clarify responsibilities (i.e. Regulatory Affairs Director; Operations Managers).

5. Procedure

Provide a step-by-step sequence of activities that must be taken to achieve the objectives in the Purpose section. Ensure that it is clear who is doing what, when and why to ensure all those identified in the positions involved/responsibilities section know exactly what needs to be done and by when. Specify what equipment, if any, will be needed and cover sequential procedures and decision factors. Address the "what ifs" and safety considerations, and include any quality control points where a check will have to be done, including any approvals.

6. References

Provide any references to policies or other procedures that link to the process.

7. Records

Clearly identify what records will be generated from the procedure that will demonstrate compliance and clarify where they must be stored.

8. Record of revisions

List the revisions that were made to the procedure including the date and who approved.

Index

Regulatory Reference

- Railway companies: section 6
- Local railway companies - main track: section 41
- Local railway companies - non-main track: section 69

All companies must keep an up-to-date index of all implemented processes referred to in sections 5, 40 or 68. For each process, the index must indicate the associated procedures, plans and methods (and date of their last revision) and the position in the company responsible for the development and implementation of those procedures, plans and methods.

- For railway companies and local railway companies operating on main track, where the accountable executive has chosen to designate a manager to develop and implement a process, the index must indicate that designated management position.
- For local railway companies operating on non-main track, the index must list the position in the railway company responsible for the process.

Sample Template: Index

(Sample illustrates format and all processes must be listed in company index.)

SMS Processes	Responsible position	Required procedures, plans and methods	Responsible position	Date of Last Revision
Process for Ensuring Compliance with Regulations, Rules and Other Instruments				

In writing

Regulatory Reference

- Railway companies: section 7
- Local railway companies - main track: section 42
- Local railway companies - non-main track: section 70

Companies must put every procedure, plan, and method required by the Regulations in writing and must indicate the date of its last revision. Companies may incorporate procedures, methods and/or plans into one document within or among processes provided they are in writing.

Records

Regulatory Reference

- Railway companies: sections 33-36
- Local railway companies - main track: sections 61-64
- Local Railway companies - non-main track: sections 81-84

In addition to the requirement to have procedures, plans, policies and methods in writing, railway companies and local railway companies must maintain certain records as evidence of the implementation of their SMS processes.

Specifically, **railway companies** must keep records of:

- the factors they took into account and the results and date of:
 - the annual review of the safety policy;
 - each analysis conducted using the process for identifying safety concerns; and
 - each evaluation of the effectiveness of remedial actions implemented to address risks identified from a risk assessment;
- the date and subject matter of each required consultation, communication or collaboration with bargaining agents, employees or employee representative selected by employees, and the manner in which it was carried out;
- the documentation for each risk assessment conducted as required by the Regulations, including remedial action;
- the written description and explanation of initiatives to achieve annual safety targets;
- the annual report outlining the conclusions of the company's continual internal monitoring activities; and
- the audit plan, signed audit report and approved action plan.

Railway companies must keep these records for six years after the day they are created. The SMS records can be consolidated as long as regulatory requirements continue to be met.

Local railway companies operating on main track must keep records of:

- the factors they took into account and the results and date of:

- the annual review of its safety policy;
- each analysis conducted using the process for identifying safety concerns; and
- each evaluation of the effectiveness of remedial actions implemented to address risks identified from a risk assessment;
- the date and subject matter of each required communication with employees, and how it was carried out;
- the documentation for each risk assessment conducted as required by the Regulations;
- the written description and explanation of initiatives to achieve annual safety targets;
- the annual report outlining the conclusions of the company's continual internal monitoring activities; and
- the audit plan, signed audit report and approved action plan.

Local railway companies operating on main track must keep these records for six years after the day they are created.

Local railway companies operating on non-main track are required to keep records of:

- the factors they took into account and the results and date of:
 - the annual review of its safety policy;
 - each analysis conducted using the process for identifying safety concerns; and
 - each evaluation of the effectiveness of the remedial actions implemented to address risks identified from a risk assessment;
- the date, subject matter and conduct for each required communication with employees; and
- the documentation for each risk assessment conducted as required by the Regulations.

Local railway companies operating on non-main track must keep these records for three years after the day they are created.

Filing and notification

Regulatory Reference

- Railway companies: sections 37-38
- Local railway companies - main track: sections 65-66
- Local railway companies - non-main track: sections 85-86

The Regulations outline documents the Minister may request from railway companies and local railway companies related to SMS. Companies must notify the Minister before making a change in operations that trigger a risk assessment (starting the transport of dangerous goods or changing the type of dangerous goods transported or changes that may affect the safety of the public or personnel, or the protection of property or the environment). At the request of the Minister, companies must file a risk assessment triggered by starting the transport of dangerous goods or dangerous goods different from those already transported, or by a change in operations.

Process by process

A process for accountability

Regulatory Reference

The requirement for this process applies to railway companies and to local railway companies operating on main track.

- Railway companies: section 8
- Local railway companies - main track: section 43

Regulatory Requirement

Designation of executive

8./43.(1) A railway company/local railway company [on main track] must designate an executive who is responsible for the operations and activities of the railway company/ local railway company [on main track] to be accountable for the extent to which the requirements of the safety management system are met, including its effectiveness in achieving the highest level of safety in its railway operations.

Notice to Minister

(2) The railway company/local railway company [on main track] must provide the Minister with the name of the accountable executive as soon as possible after he or she has been designated.

Declaration to the Minister

(3) The railway company/local railway company [on main track] must ensure that, within 30 days after the day on which it designates an accountable executive, the accountable executive provides the Minister with a signed declaration accepting accountability for the extent to which the requirements of the safety management system have been met.

Designation of managers

(4) The railway company/local railway company [on main track] may, in its safety management system, permit the accountable executive to designate one or more persons to develop and implement one or more of the processes required by this Part. A designated person must occupy a management position within the railway company that includes responsibilities relevant to the process or processes and the authority to make decisions with respect to that process or those processes.

Annual update

(5) If the accountable executive designates a person under subsection (4), the accountable executive must ensure that the person reports to him or her, on an annual basis, with respect to:

- (a) any problems following the procedures or implementing the plans and methods, and the manner in which those problems have been or are being resolved or, if applicable, the reasons why they have not been or are not being resolved; and
- (b) the effectiveness of the procedures, plans and methods in contributing to the improvement of the safety of the railway company's operations.

Guidance

A company must designate an executive who is:

- responsible for the operations and activities of the company; and

- accountable for the company meeting the regulatory requirements for SMS, including development, implementation and effectiveness.

The company must provide the Minister with the name of the accountable executive as soon as possible and, within 30 days, provide the Minister with a signed declaration from that person accepting accountability.

Note: Companies will provide the initial notification by email to RailSafety@tc.gc.ca or by mail to:

Transport Canada

Rail Safety Branch

Mailstop: ASR

427 Laurier Street West,

Ottawa, Ontario, K1A 0N5

While the accountable executive is ultimately responsible for ensuring the SMS requirements are met and implemented, they may designate an appropriate manager(s) to develop and implement one or more required processes. If the accountable executive chooses to designate a manager, two requirements apply:

1. the accountable executive must ensure that the designated manager reports to him or her, on an annual basis, any problems following the procedures or implementing the plans and methods, and the effectiveness of the procedures, plans and methods. This ensures the accountable executive is aware of any issues related to the processes and the overall operation of the SMS; and
2. the designated management position must appear in the company's index.

Linkages

The requirement for the designated manager to report to the accountable executive links to the process for continual improvement of the SMS, which requires companies to monitor the implementation of their SMS on a continual basis to verify that they are:

- following the required procedures; and
- implementing the required methods and plans.

If applicable, internal monitoring must include assessing:

- the cause of deficiencies in implementing the SMS;
- actions taken to remedy deficiencies; and
- the reasons why targets are not achieved.

For this reason, companies should consider the internal monitoring requirements when developing the process for accountability.

Sample Template: Declaration of Accountable Executive

I, _____ (full name of accountable executive), _____ (title)
of _____ (company name) accept accountability for the extent to which
_____ (company name) meets the requirements of its safety management system.

Signature: _____ Date: _____

Note: Companies will provide the declaration by email to RailSafety@tc.gc.ca or by mail to:

Transport Canada

Rail Safety Branch

Mailstop: ASR

427 Laurier Street West,

Ottawa, Ontario, K1A 0N5

A process with respect to a safety policy

Regulatory Reference

The requirement for this process applies to all companies.

- Railway companies: section 9
- Local railway companies - main track: section 44
- Local railway companies - non-main track: section 71

Regulatory Requirement

Safety policy

9./44./71.(1) A company must include, in its safety management system, a written safety policy that reflects the company's commitment to promoting railway safety. The policy must be approved and signed by the accountable executive.

Annual review

(2) The company must ensure that its safety policy is reviewed annually.

Communication

(3) The company must communicate its safety policy, and any changes to the policy, to its employees.

Guidance

The written policy must be approved and signed by the accountable executive (or, in the case of local railway companies on non-main track, by an executive responsible for the company's operations and activities) and be reviewed annually. The purpose of an annual review is to ensure that the policy continues to reflect the company's safety philosophy in the context of current operations. Although the policy is a relatively high-level document, it may require revision to reflect:

- changes in the company's operations;
- changes to the company's corporate structure; or
- new safety-related programs.

A safety policy reflects a company's commitment to promoting railway safety. It encourages the development of a safety culture within the organization and outlines the company's safety philosophy, which guides related activities (i.e. objectives, policies, procedures, programs, targets and initiatives).

The company must communicate the policy and any changes to employees. Employee awareness of the company's safety policy helps to create a safety culture among employees and ensures they understand the rationale behind a company's safety activities.

Linkages

The company must keep records of the factors considered, results of the annual review, and date the review of the safety policy occurred. Companies must also keep a record of the date, subject matter and conduct of employee communication.

Railway companies and local railway companies on main track must keep records for six years while local railway companies on non-main track must keep records for three years.

Sample: Safety Policy

Safety Policy - ABC Rail

ABC Railway, in partnership with its employees, will operate in a way that makes safety a priority in all our operations. ABC Senior Management Committee will, therefore, ensure that:

- all company decisions take into account the potential impact on the safety of our operations; and
- each employee will see safety as key to successfully fulfilling their duties.
- ABC Rail is committed to being a leader in safety and to continually improve safety through the following objectives:
 - enhancing cooperation and collaboration with our employees;
 - promoting a culture of safety vigilance and awareness;
 - implementing effective processes and procedures that comply with all applicable legislative and regulatory requirements;
 - reviewing all safety incidents and accidents and lessons learned;
 - providing the leadership, organization, training and resources needed to maintain a healthy and safe working environment; and
 - communicating and informing employees about safety issues.

Achieving the highest level of safety requires everyone in the company to fully understand their safety responsibilities and to commit to working towards a more proactive safety culture.



J.W. Smith, EVP & CEO

A process for ensuring compliance with regulations, rules and other instruments

Regulatory Reference

The requirement for this process applies to all companies.

- Railway companies: sections 10-11
- Local railway companies - main track: sections 45-46
- Local railway companies - non-main track: sections 72-73

Regulatory Requirement

List of instruments

10./45./72.(1) A company must include, in its safety management system, a list of the following instruments relating to railway safety:

- (a) any regulations made under the Act that apply to the company and that are in force;
- (b) any engineering standards approved by the Minister under section 7 of the Act or established by the Minister under subsection 19(7) of the Act that apply to the railway company and that are in effect (applies only to railway companies);
- (c) any rules approved or established by the Minister under section 19 of the Act that apply to the company and that are in force;
- (d) any exemptions granted under section 22 or 22.1 of the Act that apply to the company and that are in effect;
- (e) any notices sent to the company under section 31 of the Act that contain an order and that are in effect; and
- (f) any documents in effect by which the Minister has ordered the company to do or to not do something, including a ministerial order issued under section 32 of the Act and an emergency directive sent under section 33 of the Act.

Date and subject matter

(2) The list of instruments must include:

- (a) in the case of an engineering standard or a rule, the date on which it was approved or established (applies only to railway companies); and
- (b) in the case of an exemption, a notice, or a document referred to in paragraph (1)(f), the date and subject matter.

Update

(3) The company must keep the list of instruments up to date and must indicate the date of its last revision.

Procedure

11./46./73. A company must include, in its safety management system, a procedure for:

- (a) reviewing and updating the list of instruments referred to in subsection 10(1)/45(1)/75(1); and
- (b) verifying compliance with:
 - (i) the requirements of the regulations, engineering standards*, rules, and notices and documents containing an order, that are referred to in the list of instruments; and
 - (ii) the terms of the exemptions referred to in the list of instruments.

*References to engineering standards apply only to railway companies.

Guidance

List of instruments (regulations, rules, notices, orders, exemptions, etc. relating to railway safety)

All companies must include in their SMS an up-to-date list of applicable regulatory instruments (i.e. regulations, rules, standards, orders, exemptions). The list must include all regulatory instruments approved by the Minister of Transport for a company (i.e. rules and engineering standards) and those a company is legally required to follow (i.e. regulations, other instruments). Companies should identify those instruments on their lists that do not pertain to their operations and provide an explanation.

The entire list must indicate the date of its last revision. The list must also include the date and subject matter for exemptions, notices and orders and orders. Moreover, the date when each rule and engineering standard was approved or established by the Minister must be indicated.

Information on new and amended regulations, rules and other instruments is available from the following sources:

- Transport Canada www.tc.gc.ca
<http://www.tc.gc.ca/eng/mediaroom/orders-directives-directions-letters-7497.html>
- The Railway Association of Canada (www.railcan.ca)
<http://www.railcan.ca/regulations/legislation>
- Justice Canada (www.justice.gc.ca)
<http://laws-lois.justice.gc.ca/eng/acts/R-4.2/>

*Sample List of Instruments (illustration only - actual list must contain **all** regulatory instruments applicable to them)*

Type of Instrument	Instrument Title	Date and subject matter (where applicable)
Regulations		
Rules		
Date of Last Revision: DD/MM/YYYY		

Procedure for reviewing and updating the list of instruments

Companies must include, in their SMS, a written procedure for reviewing and updating the list of instruments. The procedure ensures that the latest instruments are listed and being implemented.

The procedure for reviewing and updating the list of instruments should regularly consult official sources and actively respond to government or industry association announcements and advisories.

The procedure should provide a step-by-step sequence of how the company will:

- ensure, on a continual basis, that the list remains accurate;
- verify the accuracy of the list (Who will be responsible? How will they know? How often will they verify? Where will they obtain the information?);

- identify when an instrument is updated, compare and analyze the differences and the impact on operations (Upon notification of change and/or new release, who will be notified within the company? In what manner and how?);
- compare the requirements of the instruments to existing practices and written materials (verification of compliance procedures) to ensure that the criteria for compliance did not change (see *Procedure for verifying compliance to the requirements set out by each item on the instruments list* section below). If the criteria for compliance of the regulatory instrument did change, the company must make appropriate changes to existing practices and written materials;
- update the list of instruments if and when necessary;
- communicate changes to employees affected by the update; and
- assess the training needs and provide training, if and when required, to ensure continuous compliance.

Procedure for verifying compliance to the requirements set out by each item on the list of instruments

Companies must have a documented procedure on how each instrument will be monitored for compliance. This may be established in one procedure, which should specify how compliance for each regulatory instrument (step-by-step) will be achieved, or a procedure may be established for each item on the list of instruments. The procedure for verifying compliance must provide a step-by-step sequence of activities that will lead to a statement of compliance, and should clarify:

- who is doing it;
- when and how often the assessment will be done;
- the criteria for determining compliance (as per the regulatory instrument);
- action to be taken if non-compliance is detected;
- where the results of this assessment are maintained; and
- who will oversee this process to ensure that it is done as required (monitoring).

The company may keep a document that will ensure all regulatory instruments have associated procedures for verifying compliance developed, which will help them be easily located when they need to be updated. The following table could assist with this task.

Sample List of Instruments with reference to verification of compliance procedures

Type of Instrument	Instrument Title	Date and subject matter (where applicable)	Verification of Compliance procedure and location (a step-by-step sequence of activities or a referenced document which contains a step-by-step procedure)
Regulations			
Rules			
Date of Last Revision: DD/MM/YYYY			

A process for managing railway occurrences

Regulatory Reference

The requirement for this process applies only to railway companies at section 12.

Regulatory Requirement

Procedure

12.(1) A railway company must include, in its safety management system, a procedure for:

- (a) reporting a railway occurrence to the railway company's management; and
- (b) reviewing a railway occurrence.

Communication

(2) The railway company must communicate to its employees the procedure for reporting railway occurrences.

Guidance

A process for reporting and reviewing railway occurrences is an important part of the risk management process. Effective reporting allows a company to respond quickly to incidents. The required review of an occurrence may result in recommendations, mitigation measures and corrective action to improve safety.

The Regulations define a “railway occurrence” as an occurrence that is reportable under section 5 of the federal *Transportation Safety Board Regulations* (TSB Regulations). Since railway companies must already report occurrences to the Transportation Safety Board, their internal reporting and management systems should also address these occurrences.

As part of this process, companies must have a procedure for:

- reporting a railway occurrence to the railway company's management; and
- reviewing a railway occurrence.

Procedure for reporting

The procedure must, at a minimum, cover reporting “railway occurrences” and should outline:

- **Who should be informed?** – Each railway occurrence must be reported to the railway company's management, which may differ depending on the size and complexity of the organization. The procedure should also outline how to relay the information to the person responsible for the process for identifying safety concerns;
- **How the information should be conveyed?** - The procedure should include details on whether information can be reported by phone or by email, and if there is an official template to use; and
- **What details should be included?** - Consistency in reporting is especially important for reviewing railway occurrences and identifying safety concerns.

Procedure for reviewing a railway occurrence

Occurrences are one of the information points that railway companies must analyze as part of the process for identifying safety concerns. The objective of reviewing an occurrence should be to

determine if immediate corrective action is needed and can be taken, or if an in-depth investigation should be conducted. Railway companies should not wait for the process for identifying safety concerns to highlight an issue for a risk assessment.

When developing a procedure for reviewing a railway occurrence, railway companies may consider developing a triage or escalation process, though some occurrences always warrant a higher level of analysis. For example, all occurrences resulting in serious injury or death should trigger an in-depth investigation.

Communicating to employees

Railway companies must communicate the procedure for reporting railway occurrences to employees. Awareness of the internal reporting procedure helps to ensure employees report occurrences consistently and appropriately, which contributes to an effective and timely response.

Linkages

Railway companies must keep a record of the date, subject matter and conduct of employee communication for six years.

All occurrence reports, along with related documentation, are sources of data for the company's process for identifying safety concerns.

Sample Procedure: Reporting a Railway Occurrence

Step 1: Emergency Responders

Call 1-800-xxx-xxxx to report the incident as soon as it occurs. The railway company's call centre will dispatch emergency responders if necessary. Take necessary steps to assure personal safety. Report the incident to the Transportation Safety Board as soon as you can.

Step 2: Incident Details

Record incident details on the railway company's Railway Occurrence Reporting Template.

Step 3: Transportation Safety Board

Report the incident to the Transportation Safety Board by calling 1-800-567-6865.

Step 4: Company Management

Report the incident to the regional manager.

Sample Template: Reporting a Railway Occurrence

Railway Occurrence Reporting Template (Single Train Occurrence)					
Occurrence Details					
Date:		Time of Occurrence:			
Train Number:		Direction:		Tonnage:	
Num. of loaded cars:			Num. of empty cars:		
Length:			Authorized Speed:		
Railway equipment operator:			Track operator:		
Occurrence Location					
Province:		Nearest City/Town:			
Track designation:		Subdivision:		Mileage:	
Injury					
Num. of crew/employees members involved:		Num. of passengers involved:		Num. of other persons involved:	
Num. of fatalities:			Num. of serious injuries:		
Damage					
Num. of railway equipment damaged, or derailed:					
Unit Reporting Mark	Loaded (Y/N)	Residue (Y/N)		UN Number (if applicable)	
If dangerous goods are released (otherwise, skip this section)					
Unit Reporting Mark	UN Number	Describe MOC		Describe condition of MOC	Initial quantity

Descriptions		
Describe the local weather conditions at the time of the occurrence and any climatic conditions such as snow, ice, wind, fog, dust and severe heat:		
Describe the occurrence and the extent of any resulting damage to the environment and to the rolling stock, railway and other property:		
Describe any action taken or planned to protect persons, property and the environment, including any evacuation as a result of the occurrence:		
Contact Information		
Name:	Title:	Phone Number:
Address:		

Note: This template was developed for a single train occurrence. A railway company could develop a similar template for use in multiple train occurrences.

Sample Procedure: Reviewing a Railway Occurrence

Step 1: Schedule a Meeting

The railway company schedules a meeting within one month of the occurrence. Meeting participants could include experts related to the occurrence and affected employees.

Step 2: Review Railway Occurrence

The review team compiles all pertinent information before the meeting, including the Railway Occurrence Report and information regarding similar events and best practices.

Step 3: Root Cause

During the meeting, the review team analyzes the documentation and works to establish the root cause of the railway occurrence.

Step 4: Solution

The review team determines if current procedures and/or training need to change to prevent a repeat of the occurrence.

Step 5: Report and Implement

The review team documents their findings and recommendations, and the railway company implements the corrective actions, if necessary.

A process for identifying safety concerns

Regulatory Reference

The requirement for this process applies to all companies.

- Railway companies: sections 13-14
- Local Railway companies - main track: sections 47-48
- Local Railway companies - non-main track: sections 74-75

Regulatory Requirement

Analyses

13./47./74. A company must, on a continual basis, conduct analyses of its railway operations to identify safety concerns, including any trends, any emerging trends or any repetitive situations. The analyses must, at a minimum, be based on:

- (a) any reports of railway occurrences/accidents;
- (b) any internal documentation relating to railway occurrences/accidents;
- (c) any reports of injuries;
- (d) the results of any inspections conducted by the company or by a railway safety inspector;
- (e) any reports of contraventions or safety hazards that are received by the company from its employees;
- (f) any complaints relating to safety that are received by the company;
- (g) any data [that is accessible to local railway companies] from safety monitoring technologies;
- (h) the conclusions of the annual report referred to in subsection 29(3)/57(3) (not applicable to local railway companies on non-main track); and
- (i) the findings of any audit reports.

Procedure

14./48./75. A company must include, in its safety management system, a procedure for conducting the analyses referred to in section 13/47/74.

Guidance

The process to identify safety concerns is a cornerstone SMS process aimed at improving the safety of railway operations. This process requires companies to have a procedure to regularly analyze safety data and feed any identified concerns into the risk assessment process.

Conducting analysis

All companies must, on a continual basis, conduct analyses of their railway operations to identify safety concerns, including any trends or emerging trends, or any repetitive situations. The word “continual” indicates that companies should conduct these analyses at a frequency that allows them to identify a trend as soon as possible. If new data is not produced, the company would be required to perform an analysis when new data becomes available.

The Regulations set out the information that companies must, at a minimum, consider as part of these analyses, which includes:

- reports of railway occurrences;
- reports of contraventions or safety hazards;
- results of any inspections; and
- the findings of any audit reports.

Note: The required information to consider varies for railway companies, local railway companies on main track, and local railway companies on non-main track.

Procedure for analysis

Companies must have a procedure for conducting the analysis of safety data. The procedure should ensure that the regulatory requirements are met by asking:

- How will the company analyze information frequently to identify safety concerns, including trends or emerging trends?
- How will the company collect and analyze all information from the required data points?
- What are the indicators of a trend? What is the threshold or definition of a “safety concern”? , and
- Who is sent the report of identified safety concerns to trigger the risk assessment?

Linkages

The company must keep records of the factors considered and the results and date of each analysis for six years (three years for local railway companies operating on non-main track).

The process for identifying safety concerns is closely linked to other SMS processes such as: the process for managing railway occurrences; the process for reporting contraventions and safety hazards; the risk assessment process; the process for establishing targets and developing initiatives; and, the process for continual improvement.

When a company identifies a safety concern, it must conduct a risk assessment that meets the requirements of the risk assessment process.

A risk assessment process

Regulatory Reference

The requirement for this process applies to all companies.

- Railway companies: sections 15-17
- Local railway companies - main track: sections 49-51
- Local railway companies - non-main track: sections 76-78

Regulatory Requirement

Risk assessment

15./49./76. (1) A company must conduct a risk assessment in the following circumstances:

- (a) *when it identifies a safety concern in its railway operations as a result of the analyses conducted under section 13/47/74;*
- (b) *when it proposes to begin transporting dangerous goods, or to begin transporting dangerous goods different from those it already transports; or*
- (c) *when a proposed change to its railway operations, including a change set out below, may affect the safety of the public or personnel or the protection of property or the environment:*
 - (i) *the introduction or elimination of a technology, or a change to a technology,*
 - (ii) *the addition or elimination of a railway work, or a change to a railway work (applies only to railway companies),*
 - (iii) *an increase in the volume of dangerous goods it transports,*
 - (iv) *a change to the route on which dangerous goods are transported, or*
 - (v) *a change affecting personnel, including an increase or decrease in the number of employees or a change in their responsibilities or duties.*

Components

(2) The risk assessment must:

- (a) *describe the circumstances that triggered the requirement to conduct the risk assessment;*
- (b) *identify and describe the risks associated with those circumstances;*
- (c) *identify the factors taken into account in the risk assessment, including the persons who may be affected and whether property or the environment is affected;*
- (d) *indicate, for each risk, the likelihood that the risk will occur and the severity of its consequences;*
- (e) *identify the risks that require remedial action; and*
- (f) *identify the remedial action for each of those risks.*

Consultation (only applies to railway companies)

16.(1) When identifying the risks that require remedial action and the remedial action to be implemented, a railway company must consult with the bargaining agents representing the employees of the railway company who are affected by any of those risks or, if there is no bargaining agent, with:

- (a) *the employees of the railway company who are affected by any of those risks; or*
- (b) *a representative selected by the employees of the railway company.*

Communication

16.(2)/50./77. *The company must communicate the risks identified as requiring remedial action, and the remedial action to be implemented, to the employees of the company who are affected by any of the circumstances referred to in subsection 15(1)/49(1)/76(1).*

Procedure, plan and method

17./51./78. *A company must include, in its safety management system:*

- (a) *a procedure for identifying the risks that require remedial action, taking into account, for each risk, the likelihood that the risk will occur and the severity of its consequences;*
- (b) *a plan for the consultation referred to in subsection 16(1) (applies only to railway companies); and*
- (c) *a method for evaluating the level of risk, taking into account the likelihood that a risk will occur and the severity of its consequences.*

Guidance

A risk assessment is a systematic use of information to comprehend the nature, sources, causes, and chance of injury or loss measured by the likelihood that they will occur, and the severity of consequences on persons, property, the environment or other things of value to determine the level of risk. It is a proactive approach to identify the risks associated with safety concerns, potential changes in operations, and obstacles that may impede companies from achieving their objectives.

The level of detail in a risk assessment will depend on the risk, purpose of the analysis, and information and resources available.

Risk is the likelihood that an incident will happen, and potential severity of the consequences. The objective for companies conducting risk assessments before making operational changes is to analyze:

- what could happen;
- how serious it could be; and
- what could be done to prevent or reduce those risks.

Risk assessments should reduce costly and/or dangerous occurrences by compelling railway companies and local railway companies to examine the risks associated with:

- safety concerns identified through data analysis; and
- a change in operations that could impact public or employee safety, protection of property or the environment, or a change in operations related to dangerous goods (starting to transport dangerous goods or changing the type of dangerous goods transported).

A risk assessment for identified safety concerns that stem from continual analysis in section 13/47/74 is intended to address the likelihood for the safety concern to occur or reoccur, and how the trend and its associated risks can be eliminated.

Companies must notify the Minister before making a change in operations or before starting to transport dangerous goods or changing the type of dangerous goods transported. The Minister may require companies to submit documentation related to risk assessments conducted for these situations. Companies should send their notification to RailSafety@tc.gc.ca.

Companies may uncover instances of regulatory non-compliance when conducting risk assessments, which should be corrected as soon as possible.

The Regulations set out the minimum circumstances for when a company must conduct a risk assessment (triggering circumstances) but they are not exhaustive. Companies are encouraged to conduct a risk assessment whenever necessary.

The emphasis on a change in operations helps determine the potential impact on the safety of the public, employees or the protection of property or the environment. If a risk assessment was not undertaken, the company may be asked to demonstrate the factors considered that led to a conclusion that the operational change would not affect the safety of the public or personnel, property or the environment.

Components of a risk assessment

The Regulations set out the components that companies must include when conducting a risk assessment. They must:

- identify and describe the circumstances that triggered the risk assessment;
- identify and describe the risks associated with those circumstances;
- identify factors taken into account, including the potential impact on persons, property, and the environment;
- indicate the likelihood that the risk will occur and the severity of the consequences if it were to occur; and
- identify the risks that require remedial action and corresponding remedial action(s).

Consultation and communication

When railway companies are identifying risks that require remedial action and potential actions, they must consult with employees affected by those risks and have a plan for consulting employees. Consultation is more than communicating the results of the process and should involve management accounting for input provided by the bargaining agents, employees, or their representatives before making a decision.

Companies must also communicate the identified risks requiring remedial action, and the remedial action to be taken, to employees affected by any of the triggering circumstances.

Procedures

The Regulations set out the minimum components of a risk assessment and require companies to have:

- a procedure for identifying the risks that require remedial action, taking into account the likelihood the risk will occur and severity of the potential consequences;
- a plan for consulting employees (only applies to railway companies); and
- a method for evaluating the level of risk, including the likelihood and severity.

These requirements do not need to be divided into distinct documents provided there are clear, written steps that cover the required components and detail how to assess risk, consult with employees, and identify risks requiring remedial action.

Linkages

The results of the risk assessment process feed into the process for implementing and evaluating remedial action.

As part of the record-keeping requirements, companies must keep documentation related to each risk assessment conducted, including communications and consultations with employees for six years (three years for local railway companies operating on non-main track).

Summary

1. Triggering circumstances
 - Safety concern
 - Change in operations
2. Conduct of a Risk Assessment
 - Describe the circumstances that triggered the process
 - Identify and describe the risks
 - Identify the factors to consider
 - Identify the likelihood and severity
 - Identify risks that require remedial actions
 - Identify remedial actions
 - ◆ Consultation (only for railway companies) and communication
 - Keep records – six years (railway companies and local railway companies on main tracks), three years (local railway companies on non-main track)
 - Implement remedial action
 - Evaluate the effectiveness of remedial action
 - ◆ Consultation (only for Railway Companies)
 - Keep records – six years (railway companies and local railway companies on main tracks), three years (Local railway companies on non-main track)

3. Notify the Minister of a change in operations

4. Submit risk assessment documentation on Minister's request

Guidance

The following example is for guidance purposes only. Companies have the option of using any risk assessment process available as long as it meets the minimum regulatory requirements. The method to evaluate risks **should** contain steps similar to steps 1-5, and **must** address step 3. A risk assessment process must include employee consultation and/or communication as required by the Regulations.

Step 1: Triggering circumstances and setting the context

A risk assessment should be conducted when one of the triggering circumstances exists.

Sample Template

STEP 1 – TRIGGERING CIRCUMSTANCES AND SETTING THE CONTEXT	
<input type="checkbox"/>	The company has identified a safety concern in its railway operations. (s. 13/ s. 15(1)(a) / 49(1)(a) / 76(1)(a))
<input type="checkbox"/>	The company is proposing to begin transporting dangerous goods. (s. 15(1)(b) / 49(1)(b) / 76(1)(b))
<input type="checkbox"/>	The company is proposing to transport dangerous goods different from those it already transports. (s. 15(1)(b) / 49(1)(b) / 76(1)(b))
The company is proposing to make changes to its railway operations that may affect the safety of the public or personnel or the protection of property or the environment. (s. 15(1)(c) / 49(1)(c) / 76(1)(c) (Select all that apply below)):	
<input type="checkbox"/>	Introduction, elimination or change of a technology.
<input type="checkbox"/>	Addition, elimination or change to a railway work (applies only to railway companies).
<input type="checkbox"/>	Increase in volume of dangerous goods transported.
<input type="checkbox"/>	Change to the route on which dangerous goods are transported.
<input type="checkbox"/>	Change affecting personnel.
<input type="checkbox"/>	Other change (specify):
IF A CHANGE IN OPERATION, DATE OF PROPOSED CHANGE:	
DESCRIPTION OF CIRCUMSTANCES THAT TRIGGERED THE RISK ASSESSMENT s. 15(2)(a) / 49(2)(a) / 76(2)(a)	
<p>The company will gather the necessary information and experts, which should include:</p> <ul style="list-style-type: none">• Information about the circumstances that triggered the risk assessment;• Appropriate personnel, including subject matter experts, management and a representative of the employees who are or would be affected by the risk;• Information about the safety requirements (rules, regulations, etc.) and safety controls the company has in place that relate to the triggering circumstances;• Information from similar circumstances (i.e. a similar safety concern at another company that resulted in a TSB report, other industry information, or best practices relevant to the situation); and• Information about the operational environment. The company should collect enough information to be able to consider the potential impact on people, the environment, and/or property.	

Identify Internal and External stakeholders:

A stakeholder could be defined as any individual, group, or organization able to affect, be affected by, or believe it might be affected by a decision or activity.

A thorough stakeholder inventory will identify stakeholders' needs, issues and concerns. An understanding of their motivations is critical to the successful resolution of an issue. A stakeholder inventory is an important starting point for developing communication and consultation plans and strategies.

Sample Template

STAKEHOLDERS s. 15(2)(c) / 49(2)(c) / 76(2)(c) Who can affect or be affected by this activity?	
Internal	<ul style="list-style-type: none"><i>Internal Stakeholders</i> are employees, shareholders, contractors, executives, etc. within the company.
External	<ul style="list-style-type: none"><i>External Stakeholders</i> are persons or groups from the rail industry, private corporations, municipalities, road authorities, citizens from the general public, etc.

Note: Step 1 should help the company meet the requirement of:

- describing the circumstances that triggered the requirement to conduct the risk assessment (s.15(2)(a), 15(2)(c) / 49(2)(a), 49(2)(c) / 76(2)(a), 76(2)(c)).*

Step 2: Identifying risks

After the railway company has described the triggering circumstances and understands the context, it should identify what risks could occur if the safety concern were to persist or if the operational change were to proceed. In other words, the company should ask: what could happen; how could it happen; and, what's the most serious potential outcome? At this stage, no assessment is underway but potential risks are identified.

Sample Template

STEP 2 – IDENTIFYING RISKS s. 15(2)(b) / 49(2)(b) / 76(2)(b) What are the risks associated with the circumstances?	
POSSIBLE RISK What can happen?	BRIEF DESCRIPTION How can it happen?

Note: Step 2 should help the company meet the requirement of:

- Identifying and describing the risks associated with those circumstances (s. 15(2)(b) / 49(2)(b) / 76(2)(b)).*

Step 3: Risk analysis/assessment and identification of risks requiring remedial action

In this step, the railway company takes each identified risk and assesses the likelihood that it would occur and the severity of the potential consequences.

The company should use an assessment scale for the likelihood and severity of consequences, and must document the risks assessed and factors it considered, including who may be affected and whether property and/or the environment could be affected.

A worksheet or excel spreadsheet could help with this step.

Likelihood

Likelihood is an estimate of the chance of an incident happening. It can be described using general terms or mathematical variables, such as a probability or frequency over time. Likelihood may consider factors such as:

- **history** - Has it happened before in the rail industry? To this company? How often?
- **safety measures in place** - What measures (legal obligations or voluntary actions) are in place that could prevent this risk?

Companies should develop a scale to help them consistently assess likelihood. The measurement of likelihood can be a number or word as demonstrated in the sample scale below. Companies can choose the level of granularity for the scale but many methods choose five levels.

Sample Likelihood Scale

Likelihood category	Descriptors
Improbable/very low	1 Has never happened before/would be expected to happen only once every 50 years/safety controls already in place should prevent this occurrence
Remote/low	2 Has happened somewhere before/would be expected to happen only once every 20 years/ safety controls integral to preventing this risk are in place
Occasional/medium	3 Can happen/could be expected to happen once in 2 years/safety controls in place lack redundancy, contain limitations
Probable/high	4 Has happened to the company before/could happen once a year/safety controls in place contain significant and known limitations to prevent this risk
Frequent/very high	5 Happens often/could happen more than once a year/there are no safety controls in place that provide a realistic possibility of preventing this risk

Severity of Consequences

The assessment of consequences considers a broad cross-section of the most likely impacts if the identified risk occurs. During this step, companies may wish to review the factors they must consider during the risk assessment:

- Who may be affected?
- Could property be affected?, and
- Could the environment be affected?

Companies should determine the degree of impacts by primarily assessing those human, environmental and property consequences directly linked to the risk occurring and its immediate aftermath. However, experts should use sound judgment and account for cases where impacts extend over long periods when they are of a very serious nature (i.e. environmental factors).

Companies should:

- adopt a reasonable worst-case approach;
- base their assessments on expert judgment; and
- support their decisions with data wherever possible (i.e. previous incidents).

Sample Severity of Consequences Scale

Severity of Consequences		Descriptors
Minimal	1	First aid or minor medical treatment/little to no environmental damage/\$X property damage (could be in description or dollar figures)
Marginal	2	Serious injury, occupational illness, lost workday/minor leak that could be contained/\$X property damage
Serious	3	Disabling injury, multiple injuries/environmental damage that requires response and site remediation/\$X property damage
Critical	4	Permanent partial disability, temporary total disability/serious environmental damage requiring site remediation and could cause long term (or large scale) environmental impacts/\$X property damage
Catastrophic	5	Death or permanent disability/severe, wide scope of impact, with long term serious environmental harm/\$X property damage

Sample Risk Level Scale

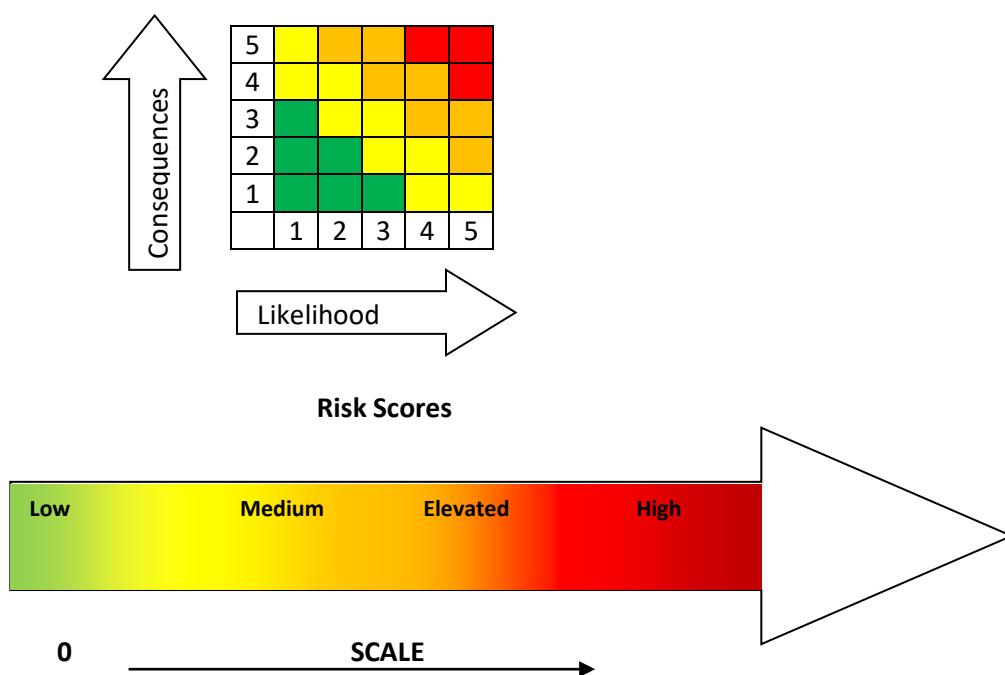
Companies must identify risks that require remedial action, and have a procedure for doing so:

- A common way is to document a risk tolerance using numeric values, colours or verbal descriptions for the likelihood and severity of consequences, and plotting the likelihood and severity of consequences on a risk level matrix. This approach helps to visually determine which risks need remedial actions and the priority for implementing remedial actions.

Companies may want to use:

- three distinct scales to clearly demonstrate that they considered human harm, environmental damage and property damage, and combine or average the level; or
- a combined scale with the factors considered documented in a worksheet.

Sample Heat Map



Sample Template

**LIST EACH IDENTIFIED RISK "POSSIBLE RISK" IN STEP 2 FOR ANALYSIS IN THE TABLE BELOW.
ASSESS THE RISKS AS PER THE COMPANY'S METHOD FOR DETERMINING LEVEL OF RISK.**

s. 17(a) / 51(a) / 78(a)

NOTES:

For the assessment of property damage, companies need to add the dollar values or description for each level of the consequences scale.

RISK TO ANALYZE	CONSEQUENCES	FACTORS Describe the factors taken into account: people, property and environment s.15(2)(c) / 49(2)(c) / 76(2)(c)	LIKELIHOOD s.15(2)(d) / 49(2)(d) / 76(2)(d)	SEVERITY s.15(2)(d) / 49(2)(d) / 76(2)(d)	RISK LEVEL	REMEDIAL ACTION REQUIRED? Yes/No s.15(2)(e) / 49(2)(e) / 76(2)(e), s.16(1), s.16(2) / 50 / 77

Note: Step 3 should help the company meet the requirements of:

- *identifying the factors taken into account in the risk assessment, including who may be affected and whether property or the environment is affected (s. 15(2)(c) / 49(2)(c) / 76(2)(c));*
- *indicating, for each risk, the likelihood that the risk will occur and the severity of its consequences (s. 15(2)(d) / 49(2)(d) / 76(2)(d), s. 15(2)(d) / 49(2)(d) / 76(2)(d));*
- *identifying the risks that require remedial actions (s.15(2)(e) / 49(2)(e) / 76(2)(e));*
- *a procedure for identifying the risks that require remedial action taking into account the likelihood that the risks will occur and the severity of their consequences (s.17(a) / 51(a) / 78(a)); and*
- *a method for evaluating the level of risk, taking into account the likelihood that a risk will occur and the severity of its consequences (s.17(c) / 51(b) / 78(b)).*

Step 4: Identification of the remedial action(s)

Once the company has determined the risks requiring remedial action, it must identify the remedial action to address those risks. Since risk is a combination of likelihood and severity of consequences, the company could either reduce the likelihood of the risk occurring or reduce the adverse consequences if the risk occurs.

Notes:

- Companies must communicate and/or consult with employees as required in the Regulations.
- Companies may wish to keep a list of common risks and best practices for reducing risks but should not rely solely on that list. Companies should also explore new options or innovative solutions where circumstances warrant.

Sample Template

STEP 4 – IDENTIFICATION OF THE REMEDIAL ACTION(S) s. 15(2)(f) / 49(2)(f) / 76(2)(f), s. 20(a) / 51(a) / 78(a) LIST THE RISKS FOUND THAT REQUIRE REMEDIAL ACTION FROM STEP 3 IN THE TABLE BELOW.	
RISK	REMEDIAL ACTION(S)

Best practice: Remedial action can also introduce residual risks that need to be assessed, treated, monitored and reviewed. Residual risks should be incorporated into the same treatment plan as the original risk and not treated as a new risk.

Questions to ask:

- i. Are there any risks remaining that are not addressed/accepted (residual) or created (new) after selecting the remedial action?
 - If so, include a remedial action to address these risks into your implementation plan.
- ii. Are there any risks present during the time between the identification of a risk and implementation of remedial action, which need to be addressed (transitional)?
 - If so, create and implement a transitional risk action plan.

Note: Step 4 should help the company meet the requirements of:

- *Identifying the remedial action for the risks identified as requiring remedial action (s. 15(2)(f) / 49(2)(f) / 76(2)(f)).*

Sample Template: Risk Assessment

SAMPLE - RISK ASSESSMENT TEMPLATE

Process and Form Information Section

[Railway Safety Management System Regulations, 2015 – Risk Assessment Process](#)

[Notification of Change in Operations form](#)

s (#) (letter) - refers to the Section in the Railway Safety Management System Regulations

This example is for guidance purposes only and use of the template is not mandatory.

Add rows to any section as required.

COMPANY NAME:		DATE OF RISK ASSESSMENT:	
STEP 1 – TRIGGERING CIRCUMSTANCES AND SETTING THE CONTEXT			
<input type="checkbox"/> The company has identified a safety concern in its railway operations. s.15(1)(a) / 49(1)(a) / 76(1)(a) <input type="checkbox"/> The company is proposing to begin transporting dangerous goods. s.15(1)(b) / 49(1)(b) / 76(1)(b) <input type="checkbox"/> The company is proposing to begin transporting dangerous goods different from those it already transports. s.15(1)(b) / 49(1)(b) / 76(1)(b)			
The company is proposing to make changes to its railway operations that may affect the safety of the public or personnel or the protection of property or the environment. s.15(1)(c) / 49(1)(c) / 76(1)(c) (Select all that apply below):			
<input type="checkbox"/> Introduction, elimination or change of a technology. <input type="checkbox"/> Addition, elimination or change to a railway work (applies only to railway companies). <input type="checkbox"/> Increase in volume of dangerous goods transported. <input type="checkbox"/> Change to the route on which dangerous goods are transported. <input type="checkbox"/> Change affecting personnel. <input type="checkbox"/> Other change (specify):			
IF A CHANGE IN OPERATION, DATE OF PROPOSED CHANGE:			
DESCRIPTION OF CIRCUMSTANCES THAT TRIGGERED THE RISK ASSESSMENT s.15(2)(a) / 49(2)(a) / 76(2)(a)			
STAKE HOLDERS s. 15(2)(c) / 49(2)(c) / 76(2)(c) Who can affect or be affected by this activity?			
Internal			
External			

STEP 2 – IDENTIFYING RISKS s.15(2)(b) / 49(2)(b) / 76(2)(b)

What are the risks associated with the circumstances?

POSSIBLE RISK What can happen?	BRIEF DESCRIPTION How can it happen?

STEP 3 – RISK ANALYSIS/ASSESSMENT

LIKELIHOOD SCALE s.17(c) / 51(b) / 78(b)

LIKELIHOOD CATEGORY	DESCRIPTORS

SEVERITY SCALE s.17(c) / 51(b) / 78(b)

SEVERITY OF CONSEQUENCES	DESCRIPTORS

RISK LEVEL MATRIX

Document the risk tolerance.

RISK LEVEL	TOLERANCE DESCRIPTORS

**LIST EACH IDENTIFIED RISK FROM "POSSIBLE RISK" IN STEP 2 FOR ANALYSIS IN THE TABLE BELOW.
ASSESS THE RISKS AS PER THE COMPANY'S METHOD FOR DETERMINING LEVEL OF RISK.** s.17(a) / 51(a) / 78(a)

NOTES:

For the assessment of property damage, companies need to add the dollar values or description for each level of the consequences scale.

RISK TO ANALYZE	CONSEQUENCES	FACTORS Describe the factors taken into account: people, property and environment s.15(2)(c) / 49(2)(c) / 76(2)(c)	LIKELIHOOD s.15(2)(d) / 49(2)(d) / 76(2)(d)	SEVERITY s.15(2)(d) / 49(2)(d) / 76(2)(d)	RISK LEVEL	REMEDIAL ACTION REQUIRED? Yes/No s.15(2)(e) / 49(2)(e) / 76(2)(e), s.16(1) ¹ , s.16(2) / 50 / 77 ² ,

STEP 4 – IDENTIFICATION OF THE REMEDIAL ACTION(S) s.15(2)(f) / 49(2)(f) / 76(2)(f), s.20(a) / 51(a) / 78(a)						
LIST THE RISKS FOUND THAT REQUIRE REMEDIAL ACTION FROM STEP 3 IN THE TABLE BELOW.						
RISK	REMEDIAL ACTION(S)					
RISK TREATMENT						
STEP 5 – Implementation and Evaluation						
IMPLEMENT REMEDIAL ACTION s.18 (1) / 52(1) / 79(1), s.20(b) / 53(b) / 80(b)		BY WHOM .	WHEN	EFFECTIVE MEASURES s.20(b) / 53(b) / 80(b)		
What needs to be done?		Name of person responsible for the implementation of the remedial action	Date to be implemented	When and how will the effectiveness of remedial measures be determined, and name of person responsible for verification of effectiveness?		

¹ Attach the Consultation and/or Communication documentation to this form

² Attach the Consultation and/or Communication documentation to this form

STEP 6 - MONITOR IMPACT / FOLLOW-UP			
Were the remedial actions completed as identified in Step 4? If not, why?			
Describe how the remedial actions were or were not effective. s.18(2) / 52(2) /79(2), s.19 ³			
Is further action or assessment required? If yes, what is required, when will it be done, how and by whom?			

A process for implementing and evaluating remedial action

Regulatory Reference

The requirement for this process applies to all companies.

- Railway companies: sections 18-20
- Local railway companies - main track: sections 52-53
- Local railway companies - non-main track: sections 79-80

³ Attach the Consultation and/or Communication documentation to this form

Regulatory Requirement

Remedial action — implementation

18./52./79.(1) A company must implement remedial action with respect to the risks that it has identified in its risk assessment as requiring remedial action.

Remedial action — evaluation

(2) The company must evaluate the effectiveness of the remedial action in reducing or eliminating the risks.

Consultation (applies only to railway companies)

19. When evaluating the effectiveness of remedial action with respect to a risk, a railway company must consult with the bargaining agents representing the employees of the railway company who are affected by the risk or, if there is no bargaining agent, with:

- (a) the employees of the railway company who are affected by the risk; or
- (b) a representative selected by the employees of the railway company.

Procedures and plan

20./53./80. A company must include, in its safety management system,

- (a) a procedure for selecting the remedial action to be implemented;
- (b) a procedure for implementing the remedial action and evaluating its effectiveness; and
- (c) a plan for the consultation referred to in section 19 (applies only to railway companies).

Guidance

Step 5 Implementation (continued from risk assessment process)

As part of the risk assessment process, companies must identify risks that require remedial action and actions to address each risk. Companies must also evaluate the effectiveness of each action.

By assessing the risk and taking the necessary remedial action before making changes to their operations, companies can proactively assess and prevent potentially dangerous situations.

Sample Template

STEP 5 - Implementation and Evaluation			
IMPLEMENT REMEDIAL ACTION s.18 (1) / 52(1) / 79(1), s.20(b) / 53(b) / 80(b)	BY WHOM	WHEN	EFFECTIVE MEASURES s.20(b) / 53(b) / 80(b)
What needs to be done?	Name of person responsible for the implementation of the remedial action	Date to be implemented	When and how will the effectiveness of remedial measures be determined, and name of person responsible for verification of effectiveness

Note: Step 5 should help the company meet the requirements of:

- *implementing remedial action with respect to the risks that it has identified in its risk assessment as requiring remedial action (s.18 (1) / 52(1) / 79(1)); and*
- *including a procedure for implementing the remedial action and evaluating its effectiveness (s.20(b) / 53(b) / 80(b)).*

Step 6: Monitor impact/follow-up

A company must keep a record of the factors considered and results of each evaluation of effectiveness, including the date the evaluation took place.

Sample Template

STEP 6 - MONITOR IMPACT / FOLLOW-UP	
Were the remedial actions completed as identified in Step 4? If not, why?	
Describe how the remedial actions were or were not effective. (s.18(2) / 52(2) / 79(2))	
Is further action or assessment required? If yes, what is required, when will it be done, how and by whom?	

Note: Step 6 should help the company meet the requirements of:

- *evaluating the effectiveness of the remedial action in mitigating or eliminating the risks (s.18(2)/52(2)/ 79(2)).*

Consultation

When evaluating the effectiveness of the remedial action, railway companies must:

- consult with employees affected by the risk (or their bargaining agents or representatives); and
- have a plan for consultation.

Consultation should involve management seeking and accounting for employee views before making a decision, not simply communicating the results of the process.

A plan for consulting employees when evaluating effectiveness

Railway companies must have a plan for consulting employees affected by the risk (or their bargaining agent or representative) when evaluating the effectiveness of remedial action. The company could incorporate this plan into the procedures below provided it is a clearly documented how employees are included in the evaluation.

Railway companies must also keep a record of the date, subject matter and conduct of the consultation for six years.

Procedure for selecting the remedial action

This procedure and the procedure for implementing the remedial action and evaluating its effectiveness are closely linked to the risk assessment process. The risk assessment process requires a company to have a procedure for identifying the risks that require remedial action and to identify the remedial action to take. The procedure for selecting remedial action should outline the steps to:

- engage appropriate personnel and subject matter experts;
- identify multiple options and best practices;
- assess whether the remedial action will reduce the likelihood or severity of the consequences of risks; and
- obtain management approvals.

Procedure for implementing the remedial action and evaluating its effectiveness

This procedure should consider steps to:

- determine the positions in the company responsible for implementing and evaluating remedial action;
- identify and allocate resources;
- develop training and promote awareness, which may necessitate the creation of internal procedures;
- set targets or objectives for mitigating risk, and timelines for evaluation;
- determine if the company implemented the remedial action;
- determine if the company communicated with employees and whether they understood the information conveyed;
- assess if the company achieved its targets or objectives for reducing risk;
- assess if the remedial action is reducing the risk as expected; and
- identify employees (in the case of a railway company) affected by the risk who must be consulted in the evaluation.

Companies may want to tie their procedure for implementing and evaluating effectiveness to the process for identifying safety concerns, particularly when an identified safety concern triggers a risk assessment.

Linkages

The remedial action to be implemented and evaluated are the direct result of the risk assessment process. In this regard, companies may choose to:

- establish a distinct procedure for identifying risks that require remedial action and distinct procedures for selecting, implementing and evaluating the effectiveness of the remedial action; or
- include these procedures in the risk assessment process provided there are clear, step-by-step instructions for selecting, implementing, and evaluating the effectiveness of the remedial action.

Companies must keep documentation for each remedial action evaluated for six years (three years for local railway companies operating on non-main track).

A process for establishing targets and developing initiatives

Regulatory Reference

The requirement for this process applies to railway companies and local railway companies operating on main track.

- Railway companies: sections 21-23
- Local railway companies - main track: sections 54-56

Regulatory Requirement

Targets and initiatives

21./54.(1) A railway company/local railway company [on main track] must, for each calendar year,

- (a) establish targets designed to improve the safety of its railway operations; and
- (b) develop initiatives to achieve each target.

Basis for establishing targets

(2) The targets must be based on the analyses conducted under section 13/47 and must take into account the results of any previous analyses.

Details of initiatives

22./55. A railway company/local railway company [on main track] must include, in its safety management system, a written description of each initiative to be implemented in order to achieve each target and a written explanation of how the initiative will contribute to achieving that target.

Communication

23./56. A railway company/local railway company [on main track] must communicate to its employees the targets established and the initiatives to be implemented.

Guidance

Railway companies and local railway companies operating on main track must, for each calendar year, establish targets to improve the safety of their operations and develop initiatives to achieve those targets. Annual targets provide opportunities to measure progress and contribute to the ultimate goal of achieving the highest level of safety. Companies must base their targets on current and previous analyses of safety concerns. Companies must have written descriptions for each initiative, written explanations of how each initiative will achieve the target, and maintain these records for six years.

Annual targets should:

- be measurable, meaningful and realistically achievable;
- promote continual safety improvement; and
- be tailored to the needs of the organization.

The process for setting targets and developing initiatives should:

- outline time frames and the data the company will collect to measure progress;
- include a plan for evaluating the achievement of targets each year; and,
- provide for an annual review and revision or reconfirmation of targets.

Since the targets and initiatives help companies improve the safety of operations, and are based on analyses of safety concerns, the following considerations may help with the selection of targets:

- Are any performance indicators below industry norms?
- Are any performance indicators worse than the previous year?
- Have new projects, undertakings, safety measures or operational changes been adopted that should be monitored or measured?

Communication

Companies must communicate targets and initiatives to employees to help them understand how they can contribute to safety objectives. Companies must also keep a record of the date, subject matter, and conduct of communications for six years.

Linkages

One function of a company's internal monitoring activities (part of the process for continual improvement of SMS further described below) is to verify whether the company is achieving its safety targets and why they were not achieved. These monitoring activities provide a source of data for identifying safety concerns, which may trigger a risk assessment.

Companies must keep the written descriptions and explanations of the targets and initiatives for six years.

At the request of the Minister, companies must submit the targets and initiatives (and related descriptions and explanations) for the current calendar year.

Note for new companies:

The requirements of this process do not apply until six months after the day the company begins operations (or the local railway company on main track begins operating railway equipment on federal track). This provides new companies a chance to gain experience from their operations before identifying issues they would like to address through targets and initiatives.

Samples: Targets and Initiatives

These samples are for illustrative purposes. Companies should choose targets and initiatives that are relevant to their own operations, and larger companies may have higher level targets and initiatives.

Example 1

Target: Reduce accidents caused by rule-related errors from # to # by [date].

Initiative: Improve employee knowledge of the *Rules Respecting Track Safety* (Rules) by providing a Rule refresher course for employees.

Details:

- By [date], develop a 1-day training course targeting aspects of the Rules that are most frequently misunderstood/misinterpreted, resulting in accidents.
- The target audience will be [X].
- The format of the course will be [X] (in-person, online, held in each region, etc.).
- By [date], all courses will be completed.

Link between target and initiative: Educating employees on the requirements of the Rules will help them conduct their functions according to the Rules, improving track safety conditions and reducing accidents.

Example 2

Target: Reduce the number of trespasser fatalities on the X subdivision from # to # by [date].

Initiative: Install fencing along certain portions of the right-of-way of the X subdivision.

Details:

- Install fencing along the right-of-way of the [X] subdivision from mile [X] to mile [X] by [date].

Link between target and initiative: Installing the fence will deter trespassers and reduce the number of fatalities.

A process for reporting contraventions and safety hazards

Regulatory Reference

The requirement for this process only applies to railway companies at section 24.

Regulatory Requirement

Internal reporting

24. (1) A railway company must include, in its safety management system, a procedure for enabling its employees to report to the railway company, without fear of reprisal, a contravention of the Act or of any regulations, rules, certificates, orders or emergency directives made under the Act in relation to safety, or a safety hazard.

Policy

(2) The railway company must include, in its safety management system, a policy, in writing, for protecting its employees from reprisals for reporting a contravention or safety hazard.

Collaboration

(3) The railway company must develop the procedure and the policy in collaboration with the bargaining agents or, if there is no bargaining agent, with its employees or a representative selected by its employees.

Communication

(4) The railway company must communicate the procedure and the policy to its employees.

Guidance

The purpose of a process for reporting contraventions and safety hazards is to encourage employees to identify and report contraventions and safety hazards that might be unreported for fear of reprisal. The goal is to advance safety by collecting, analyzing and sharing data.

Railway companies must have a procedure and a written policy for protecting employees from reprisals for reporting a contravention or a safety hazard.

Collaboration and communication

The railway company must collaborate with employees or their bargaining agents or representatives to develop the procedure and policy, and must communicate both to employees. Companies must also keep a record of the date, subject matter, and conduct of the collaboration and communication for six years.

Procedure for reporting

The procedure for reporting must be in writing and should outline the steps to follow, which could include:

- reporting time-frames;

- how, to whom and in what form (templates) employees report contraventions and safety hazards;
- the level of analysis the company will undertake for each report, and by whom;
- whether and/or how the company will respond to reports; and
- how the information will inform the process for identifying safety concerns.

Policy

The procedure and policy exist to encourage reporting and protect employees from reprisal for reporting but situations may occur where employees are subject to reprisal for actions or behaviors reported. As a result, the policy might reference when a company will consider disciplinary action against an employee for a reported contravention or hazard.

Linkages

Employee reports are one source of data for the analyses to identify safety concerns. Any trends that emerge from employee reporting could be identified as safety concerns that require a risk assessment.

A process for managing knowledge

Regulatory Reference

The requirement for this process applies only to railway companies at sections 25-27.

Regulatory Requirement

List

25.(1) *A railway company must establish a list setting out:*

- (a) the duties that are essential to safe railway operations;*
- (b) the positions in the railway company that have responsibility for the performance of each of those duties; and*
- (c) the skills and qualifications required to perform each of those duties safely.*

Employees — skills and qualifications

(2) *The railway company must ensure that an employee who performs any of the duties referred to in paragraph (1)(a) has the skills and qualifications referred to in paragraph (1)(c).*

Employees — knowledge

(3) *The railway company must ensure that an employee who performs any of the duties referred to in paragraph (1)(a) has knowledge of:*

- (a) the requirements of the instruments referred to in subsection 10(1) that the employee needs to know to carry out his or her duties safely;*
- (b) any federal legislation that may affect railway safety and that the employee needs to know to carry out his or her duties safely; and*
- (c) any of the railway company's procedures — including any procedure referred to in this Part — standards, instructions, bulletins or other internal documents that may affect railway safety and that the employee needs to know to carry out his or her duties safely.*

Other persons

26. *A railway company must ensure that any person, other than an employee, who is authorized by the railway company to access the railway and whose activities may affect the safety of railway operations has knowledge of:*

- (a) the requirements of the instruments referred to in subsection 10(1) that the person needs to know to carry out his or her activities safely;
- (b) any federal legislation that may affect railway safety and that the person needs to know to carry out his or her activities safely; and
- (c) any of the railway company's procedures — including any procedure referred to in this Part — standards, instructions, bulletins or other internal documents that may affect railway safety and that the person needs to know to carry out his or her activities safely.

Plan and methods

27. A railway company must include, in its safety management system:

- (a) a plan for ensuring that an employee who performs any of the duties referred to in paragraph 25(1)(a) has the skills and qualifications referred to in paragraph 25(1)(c) and the knowledge referred to in subsection 25(3);
- (b) a method for verifying that an employee who performs any of the duties referred to in paragraph 25(1)(a) has the skills and qualifications referred to in paragraph 25(1)(c) and the knowledge referred to in subsection 25(3);
- (c) a method for supervising an employee who performs any of the duties referred to in paragraph 25(1)(a); and
- (d) a method for verifying that a person referred to in section 26 has the knowledge referred to in that section.

Guidance

The requirement for a process for managing knowledge is performance-based and requires railway companies to ensure that employees have the knowledge, skills, qualifications and supervision needed to perform their assigned duties safely, and non-employees have the knowledge needed to carry out their activities safely.

The requirements of the process cover two groups:

- 1) **Employees** of the company (including supervisors and management) whose duties are essential to safe railway operations, including long-term contract employees who are part of daily operations, as opposed to contract employees hired for a short duration for a specific problem or issue; and
- 2) **Persons other than employees authorized to access the railway** and whose activities may affect the safety of railway operations (i.e. visitors, delivery persons, contractors, (i.e. contractor hired to install fiber optic cables on right-of-way, contractor hired to assist in the clean-up of a derailment site)).

Note: “Railway” in the context of access to the railway has the same meaning as section 4 of the *Railway Safety Act*. Namely, a “railway” means a railway within the legislative authority of Parliament and includes:

- (a) branches, extensions, sidings, railway bridges, tunnels, stations, depots, wharfs, rolling stock, equipment, stores or other things connected with the railway; and
- (b) communications or signaling systems and related facilities and equipment used for railway purposes.

A railway company must ensure that employees, and persons other than employees authorized to access the railway, have knowledge of the following to carry out their duties or activities safely:

- the requirements from the list of instruments (see the requirement that forms part of the process for ensuring compliance with regulations, rules and other instruments);
- any federal legislation that may affect railway safety; and
- any of the railway company's procedures (including those mandated by the Regulations), standards, instructions, bulletins or other internal documents.

Note: Railway companies must also ensure that employees whose duties are essential to safe railway operations have the skills and qualifications related to these duties.

Lists

Railway companies must establish: a list of duties essential to safe railway operations; positions with responsibility for performing each of those duties; and, the skills and qualifications a person needs to perform the duties. These requirements will help make companies aware of the skills and qualifications that employees performing duties must possess, and link those duties (and required skills and qualifications) to positions within the company.

The list should capture railway positions directly engaged in the operation of trains in main track or yard service, rail traffic control and other positions that perform duties essential to safe railway operations. Examples of other duties essential to rail operations may include:

- reporting safety hazards;
- reporting accidents and incidents;
- conducting risk assessments;
- developing SMS processes and procedures; and
- analyzing safety data.

The level of detail in the list of duties should capture the difference between the skills and qualifications required without listing each safety-related task or activity. For example, the list should describe a duty as conducting or participating in a risk assessment rather than listing each task or activity related to conducting a risk assessment.

Employee knowledge

Railway companies must ensure that employees who perform essential duties have knowledge of the following to carry out their duties safely:

- the requirements from the list of instruments (see the list requirement that forms part of the process for ensuring compliance);
- any federal legislation that may affect railway safety; and
- any of the railway company's procedures (including those mandated by the Regulations), standards, instructions, bulletins or other internal documents that may affect railway safety.

Note: Railway companies may want to incorporate the requirements of railway safety instruments and federal legislation into their processes, operating procedures, manuals and training programs, rather than expecting employees to know the wording of actual instruments and legislation.

Knowledge of persons other than employees

Railway companies must ensure that any person, other than an employee, authorized to access the railway and whose activities may affect the safety of railway operations, has the knowledge to carry out his or her activities safely. The knowledge of the authorized person must be similar to employees, but at a level of detail suitable for the actual activities conducted.

The requirement is linked to the scope of the authorized person's activities. For example, signs may be enough to convey the information needed by a delivery driver whereas visitors observing railway operations may need a training course.

Plans and Methods

Railway companies must have a plan and methods for ensuring that employees and authorized persons other than employees have the knowledge, skills, qualifications and supervision (as applicable) needed.

A plan to ensure that employees have the required knowledge, skills and qualifications, and a method for verification.

The Regulations do not prescribe **how** companies transfer knowledge to employees but require employees to **have** the knowledge. Railway companies may choose the best way to transfer knowledge to employees. The list of duties, positions and skills and qualifications required will help the railway companies determine what knowledge, skills and qualifications each employee needs.

Depending on the size of the company, and the type of knowledge, qualification and skills required, the plan may:

- outline training courses that employees must complete or professional designations they must hold; or
- describe how the company will deliver on-the-job training to ensure employees have the knowledge and skills needed.

Verifying the knowledge employees have can vary and may include formal testing, verbal quizzing, or other approaches for different types of skills and qualifications. Nonetheless, railway companies must document their methods in all instances. The Regulations do not outline requirements for re-training but given the requirement that any employee with duties essential to safe railway operations must **have** the skills and qualifications and the knowledge to carry out duties safely, railway companies must ensure that the employee's skills and qualifications are current, retained and updated as appropriate.

Railway companies may want to include the following measures in the plan and verification method:

- ensure that employees have received the necessary training and certification, and that qualifications are kept current;
- maintain records of training and certification requirements, and whether employees continue to meet these requirements;
- test compliance and proficiency in all disciplines, maintain accurate records and take follow-up corrective action (i.e. additional training);
- conduct periodic reviews of qualification requirements that account for the results of proficiency testing, compliance evaluations, risk assessments, occurrence investigations and safety data analysis; and

- communicate to employees any changes to safety policies, work procedures, practices, requirements, rules and standards.

A method for supervising employees

The method should describe how employees with duties essential to safe railway operations are supervised, and could include details about:

- scheduled and spontaneous observations;
- communication and feedback about performance and knowledge; and
- communication of new information.

A method for verifying that persons, other than employees, have the required knowledge

Although not required, railway companies may wish to list the:

- categories of persons authorized to access the railway;
- activities those persons would undertake; and
- knowledge required for each of those activities.

A process with respect to scheduling

Regulatory Reference

The requirement for this process applies only to railway companies at section 28.

Regulatory Requirement

Principles of fatigue science

28. (1) A railway company must apply the principles of fatigue science when scheduling the work of the employees referred to in subsection (2), including the principles:

- (a) that human fatigue is governed by physiology;
- (b) that human alertness is affected by circadian rhythms;
- (c) that human performance degrades in relation to hours of wakefulness and accumulated sleep debt; and
- (d) that humans have baseline minimum physiological sleep needs.

Method

(2) The railway company must include, in its safety management system, a method for applying the principles of fatigue science when scheduling the work of an employee who is required to work according to a schedule that:

- (a) is not communicated to the employee at least 72 hours in advance;
- (b) requires the employee to work beyond his or her normal work schedule; or
- (c) requires the employee to work between midnight and 6:00 a.m.

Communication

(3) The railway company must communicate, to any employees who are required by the railway company to work according to a schedule referred to in subsection (2), how the principles of fatigue science have been taken into account when requiring them to work according to that schedule.

Exception

(4) This section does not apply when scheduling the work of employees during an emergency related to the safety of railway operations.

Guidance

To reduce fatigue in the workplace and help ensure safe railway operations, this process targets situations where employees are required to work schedules identified as “higher-risk” for fatigue. A fatigued person may be less alert and take longer to react than someone who is not fatigued. Fatigue increases the likelihood of errors and lowers performance. Given the link between shift scheduling, employee fatigue and risk of accidents⁴, shift scheduling must align with human factors principles to help:

- minimize fatigue in the workplace;
- reduce fatigue-related accidents or incidents; and
- increase employee health, productivity, and morale.

The Regulations focus on employees with schedules that are either less predictable and/or at higher risk for fatigue and complement existing obligations outlined in the *Work/Rest Rules for Railway Operating Employees*, including the requirement that railway companies develop and implement fatigue management plans.

The Regulations require railway companies to develop, document, and communicate to employees a method for applying four principles of fatigue science to three shift scheduling scenarios identified as “higher-risk” for fatigue. The railway company should understand the impact shift schedules might have on employee alertness and fitness for duty, and must implement the method to mitigate the risk of fatigue by applying the principles of fatigue science.

The company should first assess and understand the groups of employees affected, which could include but is not limited to:

- operating employees;
- yard masters;
- rail traffic controllers;
- employees working night shifts; and
- employees working in offices who are required to take on a safety critical task after completing office work.

Principles of Fatigue Science

The four key principles of fatigue science that railway companies must apply to the shift scheduling of employees include the following:

- human fatigue is governed by physiology;
- human alertness is affected by circadian rhythms;
- human performance degrades in relation to hours of wakefulness and accumulated sleep debt; and
- humans have baseline minimum physiological sleep needs.

⁴ Federal Railroad Administration (2013). Fatigue Status of the US Rail Industry.

<https://www.fra.dot.gov/Elib/Document/2929>

General information on Principles of Fatigue Science

Physiology and physiological sleep needs

Most people require 7 to 9 hours of uninterrupted nightly sleep but some require more or less than this amount. The duration and quality of sleep have a direct effect on the level of alertness.⁵ Obtaining less than the minimum quantity of good quality sleep, even by one to two hours, causes reduced alertness and performance the next day. Excessively long shifts and/or consecutive shifts that remove the opportunity for sleep or disrupt the normal daily rhythm (in particular, nights and early morning starts), will:

- reduce the quantity and quality of sleep;
- lead to an accumulated 'sleep debt'; and
- progressively worsen alertness and performance.

Ongoing sleep disruption leads to chronic sleep loss, further deterioration in work performance, and long-term physical and mental health problems.⁶

Circadian rhythms

A person's physical and psychological functioning fluctuates throughout 24 hours. These fluctuations are known as circadian rhythms and are genetically determined by the brain's biological 'clock'. As this 'clock' is sensitive to light and darkness, people are genetically designed to sleep at night and be awake during the day. The reason it is difficult to adapt to shift work is that the body is constantly being drawn back to its natural day/night cycle. Mental and physical performance capacity consequently drops when alertness levels are naturally low in the early morning hours.⁷

Hours of wakefulness

Guidance produced for the road transportation industry made the following comparisons:

- After 17 continuous hours awake, including time awake before driving, drivers perform as if they had a Blood Alcohol Concentration (BAC) of 0.05%⁸.
- After 24 hours awake, a driver's performance will be on par with that of a person with a BAC of 0.10%

Method

Railway companies must include, in their SMS, a method for applying the principles of fatigue science for an employee who must work according to a schedule that:

- is not communicated at least 72 hours in advance;
- requires them to work beyond his/her normal schedule; or
- requires them to work between midnight and 6 a.m.

The method to apply fatigue science to shift scheduling could include a number of practices for reducing the risks of fatigue. For example, companies could consider:

- employee education programs, including information about performance risks, and strategies for reducing the risk such as physical activity, diet and naps;
- limiting the duration of shifts based on physiology;
- limiting total duty hours for each seven day scheduling period;

⁵ RSSB Managing occupational road risk associated with driver fatigue <http://www.rssb.co.uk/library/improving-industry-performance/2013-good-practice-guide-t997-managing-occupational-road-risk.pdf> page 11

⁶ RSSB Managing Fatigue- A good practice guide September 2012 page 13 (see link above)

⁷ RSSB Managing Fatigue- A good practice guide September 2012 page 13

⁸ RSSB Managing Fatigue- A good practice guide September 2012 page 12

- limiting consecutive shifts before a rest day, with stricter limits on consecutive night shifts (i.e. 3);
- setting minimums for rest between shifts (i.e. no fewer than 8 hours between shifts);
- setting minimums for recuperative rest days between consecutive shifts, including at least two biological nights;
- conducting fatigue risk assessments;
- limiting duration of time away from home terminal;
- establishing a non-punitive fatigue reporting system;
- analyzing schedule-induced fatigue using fatigue avoidance software;
- checking the effectiveness of company fatigue mitigation strategies by measuring employee fatigue or alertness (i.e. psychomotor vigilance testing, actigraph monitoring, diary studies);
- promoting the benefits of early reporting of fatigue-related issues; and
- investigating and applying lessons learned from the results of incidents or accidents where fatigue may have been responsible.

A method could use knowledge of fatigue science principles to outline the fatigue risk mitigation strategies that would be applied to each scheduling scenario. For example, a railway company's method could indicate that when employees are scheduled to work between midnight and 6:00 a.m., the practices used to reduce the risks associated with human physiology, circadian rhythms, and sleep debt would be:

- limiting the number of consecutive shifts before a rest day to X;
- limiting the duration of shifts to Y; and
- implementing an employee fatigue education program.

The method could use different fatigue risk reduction practices for each scheduling scenario.

Note: These requirements do not apply to scheduling during an emergency related to the safety of railway operations. For clarity, an example of what might constitute an emergency can be found in the *Work/Rest Rules for Railway Operating Employees*, which is defined as a sudden or unforeseen situation where injury or harm has been sustained, or could reasonably be sustained to employee(s), passenger(s), the public or the environment such as those involving a casualty or unavoidable accident, an Act of God, severe storms, major earthquakes, washouts, derailments or where there has been a delay resulting from a cause not known to the railway company at the time employees leave the terminal and which could not have been foreseen.

Communication

The railway company must communicate to employees required to work one of the shift schedules listed in the Regulations on how it has accounted for the principles of fatigue science. The communication may be done each time the method is applied to shift scheduling or when the method is established and applied to groupings of scheduling scenarios (i.e. every time an employee is required to work beyond his or her normal schedule, method X would be applied). Companies must also keep a record of the date, subject matter and conduct of the communication for six years.

When employees know how the company applied the principles of fatigue, they can better understand the rationale behind scheduling decisions.

A process for continual improvement of the safety management system

Internal monitoring

Regulatory Reference

The requirement for this process applies to railway companies and local railway companies operating on main track.

- Railway companies: section 29
- Local railway companies - main track: section 57

Regulatory Requirement

Monitoring

29./57. (1) A railway company/local railway company [on main track] must, on a continual basis, monitor the implementation of its safety management system to verify:

- (a) whether the bargaining agents, the employees or a representative selected by the employees are being involved in the processes as required by this Part (applies only to railway companies);
- (b) whether the targets established by the railway company/local railway company [on main track] under section 21/54 are being achieved; and
- (c) whether the procedures required by this Part are being followed, and whether the policy referred to in subsection 24(2) and the methods and plans required by this Part are being implemented (for railway companies) [section 29]; or
- (d) whether the procedures required by this Division are being followed, and whether the methods required by this Division are being implemented (for local railway companies on main track) [section 57].

Deficiencies in implementation

(2) Monitoring must include, if applicable, inquiring into:

- (a) the cause of any deficiencies in the implementation of the railway company's/local railway company's [on main track] safety management system and any actions being taken to remedy those deficiencies; and
- (b) the reasons why the targets are not being achieved.

Annual report

(3) The railway company/local railway company [on main track] must prepare an annual report setting out the conclusions of its monitoring activities.

Accountable executive

(4) The railway company must ensure that the conclusions of the annual report are brought to the attention of the accountable executive.

Guidance

Companies must monitor the implementation of their SMS on a continual basis, to verify whether:

- employees or their bargaining agents or representatives are involved in processes as required (railway companies only);
- targets are being achieved and, if not, why they are not being achieved; and
- the required procedures, methods and plans are implemented and followed.

Monitoring must also include exploring the cause of deficiencies identified in the implementation of the SMS and taking actions to remedy those deficiencies.

The accountable executive should monitor the SMS to:

- be aware of the success of the SMS and all its components; and
- pursue the highest level of safety in railway operations by addressing issues that support continual improvements.

Companies may find it easier to measure and track whether the required procedures, methods and plans are being followed by creating a table that lists each process with the required procedures, methods or plans, and outlines how implementation will be measured.

Annual report

Companies must:

- prepare an annual report outlining the conclusions of monitoring activities; and
- ensure that these conclusions are brought to the attention of the accountable executive.

Linkages

Companies must analyze the conclusions of the annual report as part of the process for identifying safety concerns. Concerns about employee involvement, the ability to achieve targets, or issues in following procedures or implementing plans or methods may trigger the need for a risk assessment.

Companies must keep the annual report for six years as part of the record-keeping requirements.

Internal audit

Regulatory Reference

The requirement for this process applies to railway companies and local railway companies operating on main track.

- Railway companies: sections 30-32
- Local railway companies - main track: sections 58-60

Regulatory Requirement

Scope and frequency

30./58. (1) A railway company/local railway company [on main track] must conduct an audit of its safety management system every three years to evaluate:

- (a) the extent to which the requirements related to each process have been implemented; and
- (b) the extent to which the policy referred to in subsection 24(2) and the procedures, plans and methods developed by the railway company are effective in improving the level of safety of its railway operations (for railway companies).
- (c) the extent to which the procedures and methods developed by the local railway company are effective in improving the level of safety of its railway operations (for local railway companies on main track).

Audit plan

(2) The railway company/local railway company [on main track] must include, in its safety management system, an audit plan that:

- (a) defines the scope of each audit;

- (b) indicates the evaluation criteria to be applied;
- (c) specifies the method to be used in conducting each evaluation; and
- (d) sets out the schedule for evaluating each process.

Audit report

31./59. (1) A railway company/local railway company [on main track] must prepare an audit report that includes the findings of the audit.

Accountable executive

(2) The accountable executive must sign the audit report to attest to his or her acceptance of the report.

Action plan

32./60. (1) A railway company/local railway company [on main track] must prepare an action plan setting out the action to be taken to address each finding in the audit report that it identifies as a deficiency in its safety management system.

Approval of action plan

(2) The accountable executive must sign the action plan to acknowledge that he or she approves it.

Guidance

Companies must conduct an internal audit of their SMS every three years to evaluate to what extent:

- the requirements of each process have been implemented; and
- related procedures, plans and methods, and the policy protecting employees from reprisals for reporting a contravention or safety hazard, are effective in improving the safety of railway operations.

Internal audits help companies determine if the requirements of each process have been implemented (personnel are aware and meeting requirements) and whether the SMS, as developed, has been effective in improving safety. Companies may find it useful to determine the level of safety at the beginning of a three-year audit cycle so results of the final year of the audit can be measured and a determination made if safety has improved.

Companies must conclude an audit of their *entire* SMS every three years but are free to determine the best approach. Companies may choose to assess a few processes at different times during the three-year period or assess all processes at once.

The complexity and size of operations may be factors to consider when selecting the audit schedule. For some companies, an internal audit every three years may be sufficient to determine the effectiveness of safety systems. The schedule should support a strong safety culture and ensure that safety systems are effective in accomplishing objectives.

Audit Plan

Companies must develop a plan for an internal audit that includes the following components:

- the *audit scope* must include all SMS processes for companies performing one audit every three years, or specify the SMS processes for each audit for companies conducting internal audits over a three-year cycle, recognizing that all processes must be assessed;
- the *evaluation criteria* (requirements) must include applicable procedures, plans, methods, and the policy for reporting contraventions and safety hazards (when applicable);

- the *method* used in conducting each evaluation such as interviews, records review, observations, testing, spot checks and surveillance; and
- the *audit schedule*, which specifies when the internal audit(s) will occur.

If internal audits are spread over three years, companies may wish to create a schedule that lists when processes will be audited and prepare an audit plan for each audit. The schedule may help with the planning and execution of internal audits.

Companies may include additional information in the audit plan that would assist with the conduct of an audit. This information could include the:

- audit team/resources, including what positions will be involved in conducting the audit(s);
- locations to visit (i.e. number of visits for multi-site companies);
- timelines and milestones (i.e. a schedule for evaluating each process);
- an environmental scan and related documentation, including past audits;
- linkages between processes to evaluate whether each process and the system as a whole is effective at improving safety; and
- auditing activities and timeline (i.e. meeting schedules, audit planning schedule).

Audit report

At the end of the internal audit, companies must prepare an audit report containing the findings of the audit.

Companies may also include the following items in the audit report:

- scope of the audit;
- audit dates;
- audited facilities and departments;
- audit team;
- summary of findings, including an assessment of the effectiveness of the audited process(s) in improving safety;
- evidence (records, interviews, observations) to support the audit findings (deficiencies); and
- opportunities for improvement.

Companies must prepare an analysis at the end of the three-year cycle that indicates if the SMS, as implemented and verified, is effective in improving the level of safety of railway operations.

The accountable executive must sign every audit report to attest to the acceptance of the report and findings raised.

Action Plan

Companies must prepare an action plan that outlines the action to address each deficiency, and the accountable executive must approve and sign the action plan.

To ensure the timely implementation of actions to rectify identified deficiencies, companies may wish to include in the action plan:

- Analysis of the underlying reasons for the deficiency to ensure the problem does not reoccur;

- A SMART action plan:
 - **Specific** – what exactly must be done, what resources are required and when will implementation occur;
 - **Measurable** – how will success be measured to ensure the problem is addressed;
 - **Assignable** – specify who will be responsible for making sure that the problem is addressed.
 - **Realistic** – If the resolution will take a long time, what interim actions are required to ensure safety and who will be responsible for implementing these actions; and
 - **Timely** – what are the specific deadlines for implementing actions.
- Timeline for when the effectiveness of implemented actions will be verified and by whom.

Linkages

The audit findings feed into the process for identifying safety concerns and may trigger a risk assessment and remedial action.

Companies must keep the audit plan, action plan, and signed audit report for six years.