Transport Canada Transports Canada

TP 15058E
(11/2010)

Rail *Safety*

Oversight and Expertise

Railway Safety Management Systems

Annex 2

TC-1004043

Canada

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ISBN: 978-1-100-17522-5
Catalogue No. T33-23/2010E-PDF

TP 15058E
(11/2010)

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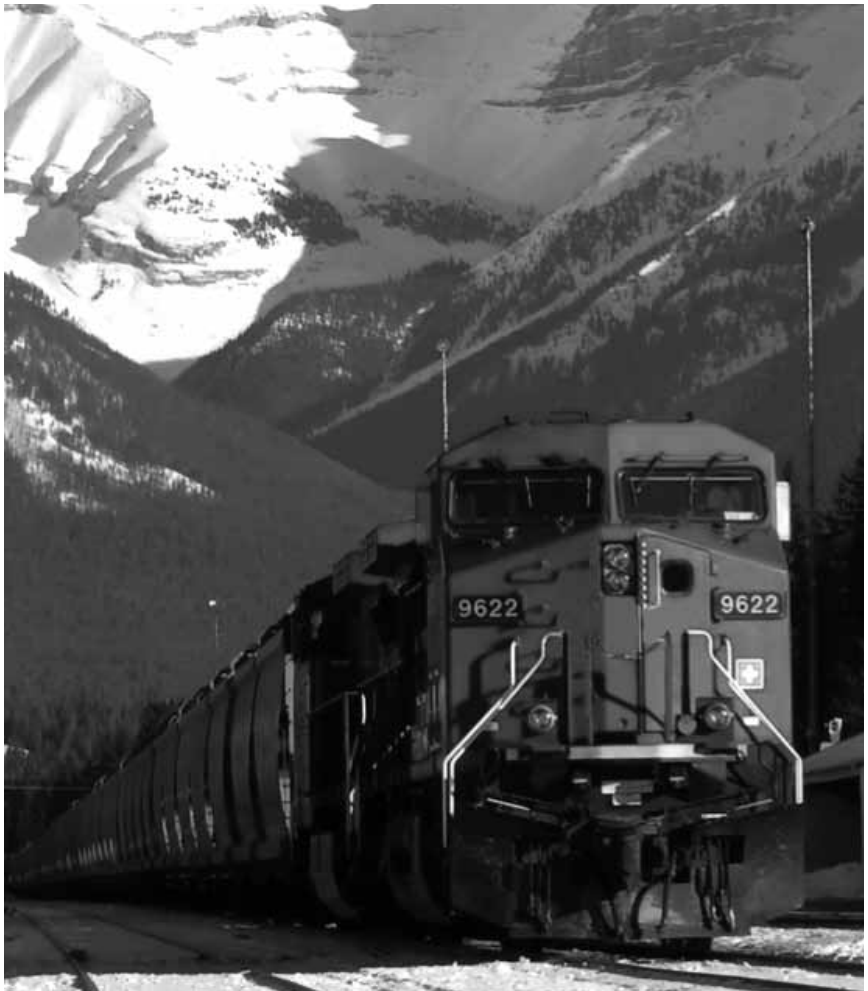
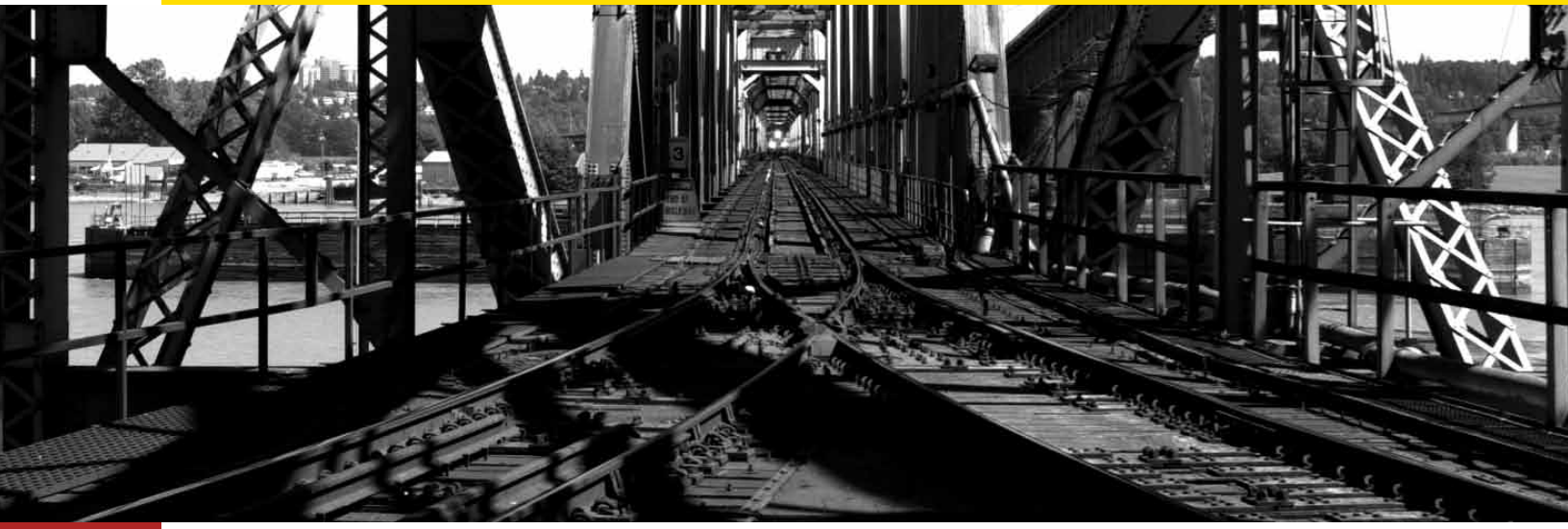
Cette publication est aussi disponible en français sous le titre *Guide de mise en place et d'amélioration des systèmes de gestion de la sécurité ferroviaire — Annexe 2 – Pratiques exemplaires pour les petites compagnies de chemin de fer.*

A Guide for Developing, Implementing and Enhancing Railway Safety Management Systems

Annex 2 – Best Practices for Small Railways





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Introduction

Annex 2 to the *Guide for Developing, Implementing and Enhancing Railway Safety Management Systems* (SMS) is intended to be read in conjunction with the *Guide* and *Annex 1–Best Practices*. It provides **practical advice and suggestions** for smaller railways on how to meet the requirements of Transport Canada's *Railway SMS Regulations*. The annex contains excerpts from relevant standards and guidelines, as well as specific **examples** of SMS methods and approaches that have been adopted by various Canadian railway companies to implement the 12 components of safety management systems required by section 2 of the regulations.

The examples contained in this document are organized under the component sub-headings, A to L, from Chapter 3.1 of the *Guide* (*Regulatory Requirements*). These examples, suitable for use in smaller railway operations, are provided for information and discussion purposes. Some railways may wish to incorporate many or all of the elements into their operational processes and modify them to suit the operation of the individual railway. More general examples of best practices can be found in *Annex 1.* Definitions are listed in Appendix B of the *Guide*. **The 12 components have been colour-coded in all three documents for ease of reference**.

Annexes 1 and *2*, and the *Guide* itself, are intended to assist railway companies in developing, implementing and enhancing SMS, pursuant to section 37 and subsection 47.1(1) of the *Railway Safety Act*. The publications have been developed through the collaborative efforts of Transport Canada, the rail industry and railway unions, under the auspices of the Safety Management Systems Working Group.

2 Railway Safety Management System Components

The 12 required components of a railway safety management system are:

a. Safety Policy, Annual Safety Targets and Associated Safety Initiatives

b. Safety Authorities, Responsibilities and Accountabilities

c. Employee and Representative Involvement

d. Compliance with Applicable Regulations, Rules, Standards and Orders

e. Risk Management Process

f. Risk Control Strategies

g. Accident and Incident Reporting, Investigation, Analysis and Corrective Action

h. Skills, Training and Supervision

i. Safety Performance Data Collection and Analysis

j. Safety Audit and Evaluation

k. Corrective Action, Approval and Monitoring

l. Documentation

Safety Policy, Annual Safety Targets and Associated Safety Initiatives

2. A railway company shall implement and maintain a safety management system that includes:

(a) the railway company safety policy and annual safety performance targets and the associated safety initiatives to achieve the targets, approved by a senior company officer and communicated to employees;

Example A-1: Safety Policy

XXXX Railway is committed to the health and safety of our employees and the public where they are impacted by our operations. To fulfill this commitment, all of us must make health and safety an integral part of our lives. We must take personal responsibility for our actions and adhere to safety policies, rules and regulations at all times. The Company is committed to provide the leadership, organization, training, and resources needed to maintain a healthy and safe working environment. All employees must make a personal commitment to safety and perform their work in a manner that will prevent accidents to themselves, their fellow workers and the public.

No job on our Railway will ever be so important that we can't take the time to do it safely.

EVP & CEO

From *Canada Labour Code* Part II

Example A-2: Safety Performance Targets

	2009	2010	2011	2012
Personal injuries*				
Fatalities	0	0	0	0
Disabling injuries	0	0	0	0
Minor injuries	3	2	2	1
Train accidents				
Yard derailments	10	8	6	4
Main track derailments	3	2	2	1
Yard collisions	2	1	1	1
Main track collisions	0	0	0	0
Grade Crossing accidents	0	0	0	0
Leading Indicators				
Safety Incidents	12	10	8	6
In-service rail failures	8	4	2	2

* From *Canada Labour Code* Part II

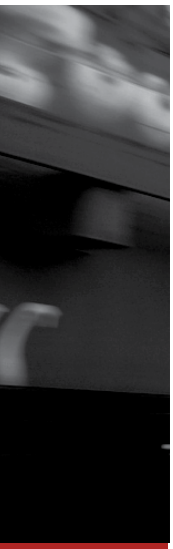
Disabling Injury – means an employment injury or an occupational disease that:

a. prevents an employee from reporting for work or from effectively performing all the duties connected with the employee's regular work on any day subsequent to the day on which the injury or disease occurred, whether or not that subsequent day is a working day for that employee;
b. results in the loss by an employee of a body member or part thereof or in the complete loss of the usefulness of a body member or part thereof; or
c. results in the permanent impairment of a body function of an employee.

Minor injury – means an employment injury or an occupational disease for which medical treatment is provided and excludes a disabling injury.

Example A-3: Safety Initiatives

Initiative	Target
Replace 50 switch ties in Alpha Yard	Reduction of yard derailments
All employees operating locomotives will attend one day refresher course on CROR	Reduction of yard collisions
Increase manager walkabouts to twice monthly	Reduction of personal injuries
Ballast and surfacing program from mile 23.7 to 29.2 Alpha Sub	Reduction of main track derailments
Operations Manager will verify implementation of all initiatives resulting from "Safety Incident Reports"	Reduction of repeat of similar incidents.
Rail relay program from mile 23.7 to 25.5 Alpha Sub	Reduction of in-service rail failures

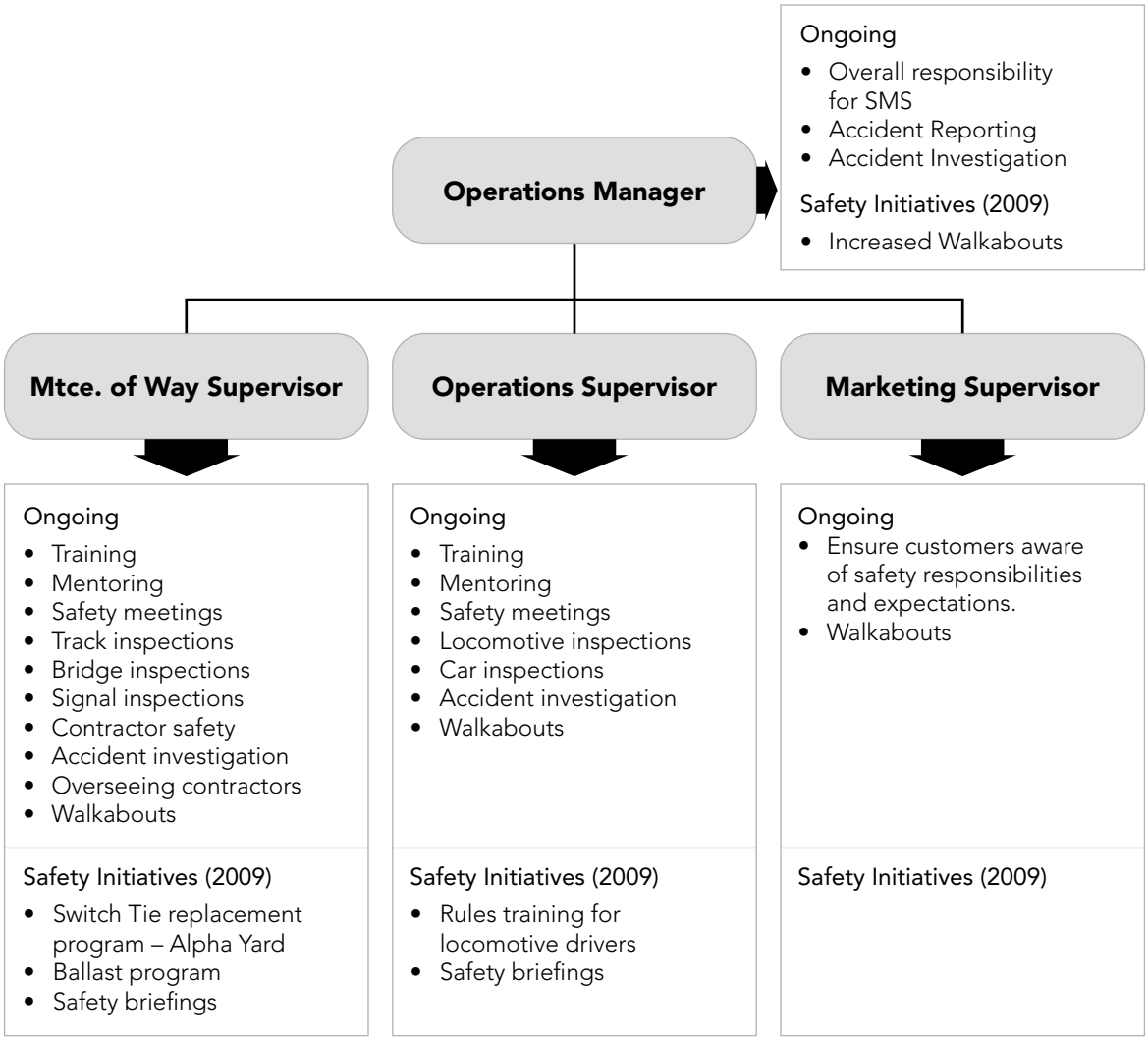


Safety Authorities, Responsibilities and Accountabilities

2. A railway company shall implement and maintain a safety management system that includes:

(b) clear authorities, responsibilities and accountabilities for safety at all levels in the railway company;

Example B-1: Organization Chart



Example B-2: Job Description

Maintenance of Way Supervisor

Safety Responsibilities:

Develops a proper and co-operative attitude toward safety among the workers by constant training and by setting a proper example in his/her own observance of the rules and conduct of his/her work.

Ensures that, for his/her area of jurisdiction, the systems and procedures contained in the company's Safety Management System are implemented.

Maintains thorough knowledge of safe work procedures and rules which are applicable to work being performed.

Communicates safety information to workers, and alerts them to potential hazards that may develop at or near the operation.

Continually observes the workers for adherence to safety rules and safe work procedures and communicates deficiencies and discusses corrective action as part of the company's efficiency testing program.

Observes the workers to determine whether they are sufficiently experienced, alert and are physically / mentally capable of perform assigned tasks safely.

Determines that adequate and suitable safety equipment is furnished and that it is properly used by workers under his/her jurisdiction.

Participates in / leads the investigation of all derailments, collisions and of personal injuries incurred by workers under his/her jurisdiction.

Inspects the work area to detect hazards. Takes necessary corrective actions.

Conducts orientation and familiarization of the immediate work area for all new employees / volunteers under his jurisdiction.

Ensures safety briefings are held and frequently participates.

Ensures that all contractors' employees are qualified and have been briefed on company safety policy and are complying with safety requirements.

Employee and Representative Involvement

2. A railway company shall implement and maintain a safety management system that includes:

(c) a system for involving employees and their representatives in the development and implementation of the railway company's safety management system;

Example C-1: Employee Involvement in SMS

Involve Health and Safety Committee members or other employees/volunteers in:

- conducting workplace inspections, proficiency tests, accident and incident investigations, risk assessments;
- hazard identification, reporting and resolving;
- implementing and monitoring corrective actions;
- communicating safety programs, policies and procedures to employees; and
- providing input on employees' complaint resolution, etc.

Example C-2: Employee Suggestion Box

Set up an employee suggestion box for safety suggestions. The suggestions are gathered and handled by the Health and Safety Committee or management, and the outcome reported in the monthly Health and Safety Committee meeting minutes or company newsletter.

Example C-3: Schedule of Employee Involvement in SMS

Schedule of SMS Discussion Items	
Item	**Frequency**
Job/Operational Briefings	Daily
Risk Control Strategies	As required
Accident Investigation	As required
Safety Audits	As required
Identification of Risks	Monthly with annual review
Training Requirements	Annually
Safety Policy	Annually

Example C-4: Safety Huddle Report

ALPHA & OMEGA RAILWAY COMPANY
Safety Huddle Report

Definition of a Safety Huddle:

A "Safety Huddle" is an informal field/workbench/tail-gate meeting to discuss a specific procedure, work method, job condition or opportunity to improve the safety of the operation and maintain a high level of safety awareness. All staff are required to arrange or participate in at least one Safety Huddle every week. Include visitors and contract staff whenever possible.

Convener:	Date:
List of personnel involved:	
Safety topic or item discussed:	
Feedback / comments of participants:	

Distribution:
Originator to fax reports weekly to Operations Manager

Example C-5: Safety Incident Report

ALPHA & OMEGA RAILWAY COMPANY
Safety Incident Report

Definition of a Safety Incident:

A "Safety Incident" is any act, procedure, equipment, or condition which is felt to be unsafe and of significant importance to warrant its being brought to the attention of other personnel (e.g.; condition cannot be rectified, may occur again, results in safety hazard to personnel or equipment, etc). Originator to fill out Sections 1 to 7 and forward to Supervisor.

1. Originator:	2. Date:
3. Location and time of incident:	
4. Personnel present/equipment involved:	
5. Description of incident:	
6. What was done at the time:	
7. Suggested solution/Additional action:	

Follow-up - To be completed by Supervisor:

8. Comments/Recommendations:
9. Resolution, Action Taken, Date to be Completed, etc.

Distribution:
1. Fax completed report to Operations Manager

Compliance with Applicable Regulations, Rules, Standards and Orders

2. A railway company shall implement and maintain a safety management system that includes:

(d) systems for identifying applicable

(i) railway safety regulations, rules, standards, and orders, and the procedures for demonstrating compliance with them, and

(ii) exemptions and the procedures for demonstrating compliance with the terms or conditions specified in the notice of exemption;

Example D-1: Identification of Regulations/Rules/Standards/Orders

Source	Monitoring Frequency
Transport Canada website (www.tc.gc.ca)	Annually
RAC website (www.railcan.ca)	Monthly
HRSDC website (http://www.rhdcc-hrsdc.gc.ca/)	Annually

Example D-2: Standards and Compliance

	Requirement	Demonstration of Compliance
1.	Rules Respecting Track Safety	Track inspection logbooks
2.	Canadian Railway Operating Rules	Efficiency test records
3.	TC Crossing Manual	Detailed safety assessments
4.	Locomotive Inspection & Safety Rules	Safety inspection records

Note: This is a good place to also document other "standards" that the railway company has developed or has voluntarily adopted, including those identified in Section 2(e) to mitigate risks, such as those issued by the Railway Association of Canada (RAC), American Association of Railroads (AAR) or the American Railway Engineering and Maintenance of Way Association (AREMA). Any "Standard Practice Circulars" or other standards adopted from larger railways should also be identified here.

Example D-3: Sample Efficiency Test Form

ALPHA & OMEGA RAILWAY COMPANY **Efficiency Test**	
Date:	Supervisor:
Location:	
Employee:	Classification:
Rules / Actions Observed:	
Observations: Pass ❒ Fail ❒	
Action Taken:	

Risk Management Process

2. A railway company shall implement and maintain a safety management system that includes:

(e) a process for

(i) identifying safety issues and concerns, including those associated with human factors, third parties and significant changes to railway operations, and

(ii) evaluating and classifying risks by means of a risk assessment.

Example E-1: Risk Identification

Source	Assessment
Occurrence investigation	Could it happen again?
RAC/TC/TSB statistics	Could it happen to us?
Inspections/Audits	Could it happen again?
Weekly staff meetings (review of concerns)	Could it happen to us/again?
Review of significant changes by management team	What could go wrong?
Negative trends (from audits & inspections)	What went wrong?

Example E-2: Risk Estimation

1. Frequency Categories

Probability Category	Frequency of Occurrence	Frequency Range
Improbable	Can assume that it won't happen. (Hasn't happened before)	Less than once in 50 years
Remote	Unlikely but could occur. (Rarely happens in Canada)	Less than once in 20 years (between 20 and 50 years)
Possible	Can happen. (Has happened on our railway)	Less than once in 2 years (between 2 and 20 years)
Probable	Likely to occur. (Occasionally happens on our railway)	Less than once per year (between 1 and 2 years)
Frequent	Occurs occasionally. (Regularly occurs on our railway)	More than once per year

2. Severity Categories

Severity Category	Examples
Catastrophic	• Fatality • Property or environmental damage that could bankrupt our railway
Critical	• Injury resulting in permanent disability • Significant property or environmental damage
Marginal	• Minor injury – reportable • Minor property damage
Negligible	• First Aid • Minimal property damage

Example E-3: Risk Evaluation

	Probability				
Severity	**Frequent**	**Probable**	**Possible**	**Remote**	**Improbable**
Catastrophic	E	E	H	H	M
Critical	E	H	H	H	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

E – Extremely High (unacceptable)
H – High (should not be tolerated)
M – Moderate (tolerable*)
L – Low (tolerable)

* only if further risk reduction would be grossly disproportionate to improvement gained

Example E-4: Examples of Significant Changes Requiring Risk Assessment

a. Increase in speed from 25 to 40 mph
b. Introduction of passenger service
c. Introduction of Dangerous Goods shipments on railway
d. Takeover or startup of new operation
e. Implementation of a new process / procedure

Example E-5: Risk Assessment

Scenario: Increase train speed from 25 to 40 mph on a section of track.

Areas of Potential Increased Risk

Management and supervisors met and identified and assessed the following areas of potential increased risk if train speeds were to be increased from 25 to 40 mph:

Risks	Failure Area	Estimated Frequency	Estimated Severity	Risk Level
Collision	Train Operation	Possible	Critical	H
Switch run through	Train Operation	Possible	Marginal	M
Derailment	Train Operation	Remote	Critical	H
	Track Failure	Possible	Critical	H
	Bridge Failure	Remote	Catastrophic	H
Public Safety	Grade Crossing Accident	Possible	Catastrophic	H
	Trespasser Struck by Train	Possible	Catastrophic	H
Employee Safety	Employee Struck by Train	Remote	Catastrophic	H
Contractor Safety	Cont. employee/equipment struck by train	Remote	Catastrophic	H

Notes:

1. All cars and locomotives in use on the railway are designed, inspected and maintained for speeds up to 60 mph and therefore were not considered as an area of potential increased risk.
2. The existing train control (OCS) is considered adequate for this operation.

See example in 2(f) for strategies used to control these risks.

Risk Control Strategies

2. A railway company shall implement and maintain a safety management system that includes:

(f) risk control strategies;

Example F-1: Risk Control Strategies

	Area of Risk	Control Strategy
Core	Operational Failure	• CROR • Safe Securement of railway equipment • Efficiency testing • Employee / Volunteer training
	Infrastructure Failure • Track • Bridge • Signal	• CP or CN Standard Practice Circulars • AREMA Manual for Railway Engineering Vol. 2 • AREMA Communications and Signals Manual
	Equipment Failure • Cars • Locomotives	• Railway Locomotive Inspection and Safety Rules • Railway Freight and Passenger Train Brake Inspection and Safety Rules • Railway Freight Car Inspection and Safety Rules
	Interface with other railways and customers	• Documented procedures and limits in Operating Instructions. • Marketing Supervisor discusses safety issues on an annual basis or as required.
	Employee / Volunteer Safety	• Canada Labour Code (Part II) or applicable Provincial legislation • Workplace Hazardous Materials Information System
	Emergencies	• RTC/Manager has up to date contact numbers for local emergency responders and CANUTEC.
Additional Risks	Grade Crossings	• TC Draft Crossing Manual
	Trespassing	• Incidents reported by all employees / volunteers, logged by RTC / Manager. Mtce. Of Way Supervisor reviews and involves local authorities.
	Contractors	• Mtce. Of Way Supervisor meets with contractor and reviews safety requirements prior to moving equipment onto site and monitors for compliance on a daily basis.

	Area of Risk	Control Strategy
Additional Risks	Passengers	• Railway Passenger Car Inspection and Safety Rules • Railway Passenger Handling Safety Rules • Passenger Train Handling - Safety & Emergency Procedures.
	Dangerous Goods	• RAC training for employees • Instructions for the Safe Handling of Railway Cars Loaded with Dangerous Goods Delayed in Transit on Railway Property • Instructions for the Transfer of Dangerous Goods in Bulk on Railway Property • Recommended Practices for the Handling of Rail Incidents Involving Dangerous Goods • Guidelines for handling non-compliant cars containing Dangerous Goods (loads and residues)

Example F-2: Risk Control Strategies for Increase of Train Speed from 25 to 40 mph.

(From risks identified in the example in E-5)

Risks	Failure Area	Control Strategy	Responsible Party	Status Review Date
Collision	Train Operation	Both locomotive engineers are experienced handling longer trains at higher speeds; however, trains will be restricted to 10 loads on initial trips		
Switch Run Through	Train Operation	Brush cleared to ensure adequate visibility of switch targets for 40 mph operation.		
Derailment	Train Operation	Inspection confirmed that visibility of signals was adequate for 40 mph operation.		
	Track Failure	Prior to speed increase the track will be rehabilitated to Class 3 standards including increased superelevation on curves		

Risks	Failure Area	Control Strategy	Responsible Party	Status Review Date
Derailment (con't)	Bridge Failure	• The 10 mph speed restriction on the bridge at mile 30.6 will remain in place. • All other structures have been inspected and approved for operation at 40 mph.		
Public Safety	Grade Crossing Accident	• All crossings have been inspected and sight lines have been cleared for 40 mph operation. • The crossings at mile 3.73 and 6.58 have automatic warning systems and the circuits will be lengthened to accommodate 40 mph operation immediately before the speed increase. • Notices will be placed in the local paper advising of the speed increase for the two weeks leading up to the implementation.		
	Trespasser Struck by Train	Operation Lifesaver presentations will be made at the one secondary and two primary schools.		
Employee Safety	Employee Struck by Train	Train speed will be included as a separate topic during safety briefings during the first month.		
Contractor Safety	Contractor's employee/ equipment struck by train	Increased train speed will be emphasized to all contractors prior to their entry onto our property.		

Example F-3: Contract Safety Assessment

ALPHA & OMEGA RAILWAY COMPANY
Contract Safety Assessment[1]

Bidder:		
Description of Service:		
Proposed Dates:	From	to
Does bidder have a safety management system in place? Yes ❒ No ❒		
Is the safety management system documented? Yes ❒ No ❒		
Type of safety management system: Developed "in house" ❒ ISO ❒ Other ❒		
Audits: Internal ❒ External ❒ Both ❒		
Are audits available for review? Yes ❒ No ❒		
Are audit results satisfactory? Yes ❒ No ❒		
Previously demonstrated capabilities and safety performance: Satisfactory ❒ Unsatisfactory ❒		
Comments:		
Operations Manager:		Date:

[1] Note: This form might be of assistance to small railways in assessing the safety-related components of proposals to supply services that represent a significant portion of their operation or an entire function, e.g., signal maintenance, track maintenance or rolling stock maintenance. This form could also be integrated into a form for the overall assessment of a proposal.

Accident and Incident Reporting, Investigation, Analysis and Corrective Action

2. *A railway company shall implement and maintain a safety management system that includes:*

(g) systems for accident and incident reporting, investigation, analysis and corrective action;

Example G-1: Accident / Incident Investigation and Follow-up Form

A&B Railway
Accident & Incident Report

Report #: _____

Details of Accident / Incident

Date:	
Time:	
Location:	
Weather / Visibility:	

Type of Accident / Incident

(A) Personal Injury:	Employee	❒
	Customer	❒
	Contractor	❒
	Other	❒

Names & Extent of Injury

Name	Minor Injury	Disabling Injury	Fatality
1.	❒	❒	❒
2.	❒	❒	❒
3.	❒	❒	❒

(B) Derailment	❒
(C) Collision	❒
(D) Runaway Equipment	❒
(E) Exceeding Operating Authority	❒
(F) Other	❒

1 of 2

Description of Accident / Incident

Date:_____

Photos attached ❒ Supervisor:_____

Corrective Action

Date:_____

Supervisor:_____

Follow-up

Date:_____

Supervisor:_____

Example G-2: Accident / Incident Reporting and Investigation

Supervisor immediately advised of accident / incident

Non-reportable Accident

1. Supervisor investigates and documents
2. Results reviewed at monthly Safety or Operational meetings

Reportable Accident

1. Supervisor advises Operations Manager
2. Operations Manager reports accident / incident to TSB / TC
3. Operations Manager investigates and documents
4. Results reviewed at monthly Safety or Operational meetings

Skills, Training and Supervision

2. *A railway company shall implement and maintain a safety management system that includes:*

(h) systems for ensuring that employees and any other persons to whom the railway company grants access to its property, have appropriate skills and training and adequate supervision to ensure that they comply with all safety requirements;

Example H-1: The Role of Supervision in Preventing Accidents Due to Operational and Human Factors

Inappropriate operating practices, judgment errors and failure to comply with rules may cause an accident. A rules violation, while serious, is not necessarily the cause of the accident. Similarly, compliance with rules or accepted operating practices does not automatically remove the cause from the "operational and human factors" group of train accident causes. The other two groups are "equipment" and "track".

Supervisors and employees must accept the principle that most accidents can be prevented. Supervisors must properly manage their people in order to prevent these causes. The employee must be educated on how to do the job and clearly instructed on what to do. Formal rules examinations, efficiency tests and observations during daily contact must be used to verify job knowledge and compliance. The employee must be given additional education after a deficiency is detected.

Source: *Train Accident Cause Finding Manual (Train Accident Prevention and Testing)*

Example H-2: Required Employee / Volunteer Qualifications

Employee Duties	Qualifications					
	"A" Card	"D" Card	TDG	First Aid	Medical	WHMIS
Supervisor	X		X	X	X	
Locomotive Engineer	X		X	X	X	
Track Foreman	X			X	X	X
Trackmen		X		X	X	X
Carmen		X		X	X	X
Signal maintainer	X			X	X	X

Example H-3: Individual Employee / Volunteer Qualifications

Employee	Qualification	Date	Due for Requalification	Note
J. Smith	"A" Card	27/03/09	27/03/11	
	TDG			
	First Aid			
	Medical			Before return to work
S. Jones	"D" Card			
	First Aid			
	Medical			
	WHMIS			

Example H-4: Operating Employee / Volunteer Qualifications[1]

Subject	Occupational Category				
	Locomotive Engineer	Rail Traffic Controller	Conductor	Other Locomotive Operator	Employees Operating Cranes or Other Machines Handling Equipment
Operating Rules	X	X	X	X	X
Train Marshalling	X		X		
Brake Systems and Tests	X		X		X
Locomotive Operation	X			X	
Train Handling	X				
Freight or Passenger Car and Train Inspection	X		X		X
Passenger Evacuation Procedures	X		X		

[1] *From TC O-102: Rules Respecting Minimum Qualification Standards for Railway Employees*

Example H-5: Required Training for Employees / Volunteers

Classification	Required Training							
	Freight Car Inspection and Safety Rules	Freight & Passenger Train Brake Rules	Locomotive Inspection & Safety Rules	Canadian Railway Operating Rules	Track Safety Rules	On Job Training	Transportation of Dangerous Goods	WHMIS
Supervisor				"A"			X	X
Carman	X	X	X	"D"		X		X
Track Foreman				"A"	X	X		X
Locomotive Engineer				"A"		X	X	
Conductor				"A"		X	X	

Example H-6: Individual Employee / Volunteer Training

Employee	Training	Date	Refresher
J. Smith	Track Safety Rules	27/03/09	
	On Job Experience (date qualified)	20/06/09	
S. Jones	Freight Car Inspection and Safety Rules	15/11/06	
	Freight & Passenger Train Brake Rules	18/03/07	
	Locomotive Inspection & Safety Rules	21/04/08	
	On Job Experience (date qualified)	26/06/08	

Example H-7: Contractor Start-up Checklist

ALPHA & OMEGA RAILWAY COMPANY
Contractor Checklist
(To be completed prior to contractor commencing work on property)

Contractor:	
Contractor's Site Supervisor:	
Description of Work:	
Work Limits:	
Dates: From	to

Protection by Railway personnel required?

No ❒
Yes ❒ Details:

Contractor's supervisor and employees have received:

Job Briefing ❒
Safety Rules ❒

Qualifications of contractor's employees reviewed ❒

Appropriate Railway employees notified ❒

Railway Supervisor:	Date:

Example H-8: Contractor Daily Checklist

ALPHA & OMEGA RAILWAY COMPANY
Contractor Safety Verification[1]
(To be completed daily[2] while contractor is working on property)

Contractor:	
Contractor's Site Supervisor:	
Description of Work:	
Date:	Time:
Contractor complying with safety requirements? Yes ❒ No ❒ Details: _____	
Contractor's Supervisor:	
Railway Supervisor:	Date:

Notes: 1. This form could be incorporated into a daily progress report.
2. Frequency could depend on type of work, proximity to track etc.

Safety Performance Data Collection and Analysis

2. *A railway company shall implement and maintain a safety management system that includes:*

(i) Procedures for the collection and analysis of data for assessing the safety performance of the railway company;

Example I-1: Data Collection and Safety Analysis

Data (from accident / incident reports)	**Summarize and Review**
Personal Injuries	
• Fatalities • Disabling Injuries • Minor Injuries	Annually Annually Annually
Train Accidents	
• Yard Derailments • Main Track Derailments • Yard Collisions • Main Track Collisions	Annually Annually Annually Annually
Crossing Accidents	Annually

Example I-2: Activity Measure

Activity	**Total**
Employee / Volunteer hours	Annually
Yard switching miles*	Annually
Train miles (main track)	Annually

* Yard switching miles can be estimated by using a conversion of 48 miles per 8-hour day per locomotive.

Example I-3: Yearly Accidents

2009 Accidents

Injuries

Fatal	0
Disabling	0
Minor	3

Train Accidents

Yard Derailments	10
Yard Collisions	2
Main Track derailments	3
Main Track collisions	0
Total	**15**

Grade Crossing Accidents

Total	**0**

Note: These are the TSB reportable accidents that must be included in the annual submission required under Section 3(1) of the *Railway Safety Management System Regulations*. However, some railways ***also*** track accidents that would be reportable under the FRA definitions. Additional indicators of safety performance such as in-service rail failures and safety incidents should also be tracked.

Example I-4: Calculation of Accident Rates

2009 Accident Rates

Total hours worked: 25,000
Total train/yard miles: 57,000

Minor Injuries

$$\text{No. of Injuries} \times \frac{200{,}000}{\text{Hrs. worked}} = \text{Accident Rate per 200,000 hrs.}$$

$$3 \times \frac{200{,}000}{25{,}000} = 24 \text{ injuries per 200,000 hrs. worked}$$

Train Accidents

$$\text{Total Accidents} \times \frac{1{,}000{,}000}{\text{Train miles}} = \text{Accident Rate per 1,000,000 train miles}$$

$$15 \times \frac{1{,}000{,}000}{57{,}000} = 263 \text{ train accidents per 1,000,000 train miles}$$

Safety Audit and Evaluation

2. *A railway company shall implement and maintain a safety management system that includes:*

(j) procedures for periodic internal safety audits, reviews by management, monitoring and evaluations of the safety management system;

Example J-1: Internal Audit Program

2009 Internal Audit Program				
Component	**Methodology**	**Person Responsible**	**Findings**	**Corrective Action**
Safety Policy, Annual Safety Targets and Associated Safety Initiatives	Interview employees / volunteers to determine awareness of safety targets.	Operations Manager		
Safety Authorities, Responsibilities and Accountabilities	Interview employees / volunteers to determine awareness of safety responsibilities within railway.	Operations Manager		
Employee and Representative Involvement	Review safety meeting documentation to confirm employee involvement in hazard identification.	Operations Manager		
Compliance with Applicable Regulations, Rules, Standards and Orders	Confirm documentation of supervisor's review of track inspection logs.	Operations Supervisor		
Risk Management Process	Confirm documentation of risk assessment resulting from one accident or significant change.	Marketing Supervisor		
Risk Control Strategies	Review Emergency Contact List for evidence that contact numbers have been updated/verified.	Marketing Supervisor		

2009 Internal Audit Program (cont'd)				
Component	**Methodology**	**Person Responsible**	**Findings**	**Corrective Action**
Accident and Incident Reporting, Investigation and Analysis	Review two accident reports and confirm that reporting procedure was followed.	Marketing Supervisor		
Skills, Training and Supervision	Verify that employee / volunteer training list is current.	Mtce. Of Way Supervisor		
Safety Performance Data Collection and Analysis	Verify accident reports have been filed correctly and summarized.	Operations Supervisor		
Safety Audit and Evaluation	Verify previous audit findings	Operations Manager		
Corrective Action Development, Approval and Monitoring	Verify Corrective Action Forms have been completed.	Marketing Supervisor		
Documentation	Review documentation for two components.	Operations Supervisor		

Corrective Action, Approval and Monitoring

2. A railway company shall implement and maintain a safety management system that includes:

(k) systems for monitoring management-approved corrective actions resulting from the systems and processes required under paragraphs (d) to (j);

Example K-1: Corrective Action Log

Date	Corrective Action	Date Verified	Initial
21/08/08	Update emergency contact list	27/08/08	JVE
15/09/08	Install employee suggestion box	12/10/08	RJF
15/09/08	Encourage more employee input at safety meetings	15/10/08	RJF
17/09/08	Lengthen crossing circuits prior to speed increase		
21/10/08	Ensure responsibilities explained to relief supvs.	30/10/08	GAR
14/11/08	Increase walking inspection of yard tracks	15/11/08	RJF

Example K-2: Corrective Action Form

ALPHA & OMEGA RAILWAY COMPANY
Corrective Action Form

Issue: Emergency Contact list in Operations Office is not current.	
Corrective Action: Office Assistant to verify all numbers and post up to date list.	
Approved by: J. Smith	Date: 21/08/08
Date implemented: 27/08/08	Review in 3 mos. ❒ 6 mos. ❒ 1 yr. ☑
Results of Review:	
Reviewed by:	Date:

Documentation

2. *A railway company shall implement and maintain a safety management system that includes:*

(l) consolidated documentation describing the systems for each component of the safety management system.

Example L-1: SMS Documentation

Safety Management System		
Component	**Location**	**Associated Documents**
2(a) Safety Policy, Annual Safety Targets and Associated Safety Initiatives	Operation Mgr's Office	• Company Safety Policy • Annual Safety Targets
2(b) Safety Authorities, Responsibilities and Accountabilities	Operation Mgr's Office	• Job Descriptions • Organization Chart
2(c) Employee and Representative Involvement	Supervisor's Office	• Safety Meeting minutes
2(d) Compliance with Applicable Regulations, Rules, Standards and Orders	Supervisor's Office	• Inspection logs • Efficiency Test records
2(e) Risk Management Process	Operation Mgr's Office	• Risk Assessment & Classification records
2(f) Risk Control Strategies	Operation Mgr's Office	• Applicable Regulations, Standards & Rules
2(g) Accident and Incident Reporting, Investigation and Analysis	Operation Mgr's Office	• Accident / Incident Reports
2(h) Skills, Training and Supervision	Operation Mgr's Office	• Employee Qualification Records • Contractor Records
2(i) Safety Performance Data Collection and Analysis	Operation Mgr's Office	• Accident / Incident Reports • Minutes of annual review
2(j) Safety Audit and Evaluation	Operation Mgr's Office	• Audit Reports
2(k) Corrective Action Development, Approval and Monitoring	Operation Mgr's Office	• Corrective Action Forms

Example L-2: SMS Amendments

SMS Amendments				
Update #	**Component**	**Updated by**	**Date**	**Description of Update**
1	2(a)	JVE	30/11/08	New safety targets
2	2(c)	JVE	03/12/08	Revised policy on employee involvement
3	2(d)	FAV	05/01/09	Updated bridge inspection standard