

National Rail Industry Advisory Forum (NRIAF)

Common principles for assessing and managing the risks to health and safety within New Zealand's railway sector.

Amendment: 1D

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Issued by:

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Chairperson
National Rail Industry Advisory Forum

1. Objective

The objective of this framework is to establish principles for assessing and managing safety risks within New Zealand's railway sector. This framework aims to ensure the protection of railway workers, passengers, the public, and support demonstration of the requirements and obligations outlined in the Railways Act¹, the Health and Safety at Work Act (HSWA)², and other railway related legislation. Through collaboration and adherence to these principles, industry participants can improve safety across the railway system.

This guidance has been created to improve and align safety risk management practices within New Zealand's railway sector. Variation in the understanding and application of risk, lack of common principles on how risk is assessed, and inconsistency in capabilities across the industry, leads to the inconsistent application of risk management. This can result in inconsistent decision-making, gaps, and overlaps that lead to an increased potential for harm. By establishing a common set of principles, this document aims to align participants toward a safer railway. Through these efforts, we strive to ensure that risk management practices are effective, consistent, and continually improving across the industry.

2. Applicability

This guidance is designed for all rail participants and their rail personnel engaged in rail activities.

Railway Participants include infrastructure owners, rail vehicle owners, railway premises owners, access providers, rail operators, network controllers, maintenance providers, railway premises managers, and any other class of person prescribed as a rail participant by the Railways Act 2005.

Railway activities include a range of responsibilities and operations, including the ownership of railway infrastructure by infrastructure owners, the ownership and management of rail vehicles by rail vehicle owners, and the ownership and maintenance of railway premises by railway premises owners. It also includes the operation and maintenance of railway infrastructure by access providers, the operation and maintenance of rail vehicles by rail operators, and the maintenance of railway infrastructure, rail vehicles, or railway premises by maintenance providers. Additionally, the management and operation of railway premises by railway premises managers, the authorisation of rail vehicles occupying or moving on a railway line by network controllers, and any activities prescribed by the Railways Act 2005.

This document is advisory, voluntary, and not legally binding. This document does not impose additional obligations on rail participants, who may utilise other methods to achieve their means of demonstrating adherence to the relevant legislation.

3. Extent of Consultation

This guidance has been developed in consultation with the National Rail Industry Advisory Forum members. Evidence of consultation is available from railregulation@nzta.govt.nz.

¹ With a specific focus on Section 7 of the Railways Act (2005)

² With a specific focus on Part 2 of the Health and Safety at Work Act (2015)

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5. Summary of Amendments

This guidance may be amended. The current amendment state is as follows:

Amendment 1: At Issue 15 August 2024

6. Legal Considerations

This document builds on the obligations defined in Subpart 1—Duties of rail participants and others, as stipulated in the Railways Act 2005. It particularly focuses on Section 7, which addresses the safety responsibilities of rail participants and their employees.

Key obligations include:

- a) **Duty of Care for Rail Participants:** Rail operators are required to ensure the risks of death and serious injury are reduced so far as is reasonably practicable.
- b) **Staff Responsibilities:** Individuals employed by rail operators avoid any actions or inaction concerning rail vehicles, infrastructure, or premises if they are aware, or ought reasonably to be aware, that such conduct could lead to death or serious harm.
- c) **Recognised standards:** consider alignment with recognised standards such as ISO 45001 for occupational health and safety management systems and EN 50126 for railway applications, as this can assist with alignment of safety practices.
- d) **Consider environmental protection:** The Railways Act requires consideration of health and safety and property. Consider the effect of rail operations on others including noise pollution, emissions, and impact on the environment, as well as risks to health, safety, and property that arise from environmental hazards.
- e) **Recognise contractual agreements:** Recognise contractual obligations between rail participants and other stakeholders, including infrastructure providers, service providers, unions and regulatory bodies, which may impact safety responsibilities and risk management practices.
- f) **Reporting:** Recognise reporting and notification requirements including the legal requirements for reporting safety incidents, near-misses, and hazards to relevant authorities, regulatory bodies, and affected parties, ensuring compliance with statutory reporting obligations.
- g) **Contracts and agreements:** Understand liability provisions within contracts, agreements and their relationship to health and safety obligations. Consider the relationship with insurance policy obligations and the associated commitments to manage risks to health and safety.
- h) **Trends:** Stay informed about emerging legal trends, precedents, and case law related to railway safety, which may influence regulatory interpretations, compliance expectations, and best practices in safety risk management.

Common Principles for Assessing and Managing Risk

7. PRINCIPLE 1: Context and Understanding

Safety risk management and documented safety risk assessments should define and document the scope, boundaries, context, assumptions, and exclusions, and any other conditions that could impact health and safety outcomes.

Aim: To enable the development of risk management strategies that are both effective and appropriately tailored. This documentation aims to ensure that:

- Risk management and safety risk assessments are conducted with a thorough understanding of site-specific circumstances.
- Operational conditions, including the extent of rail participant activities, are captured effectively
- Operational and regulatory considerations, assumptions about those exposed to risks, are well defined and documented.

Considerations:

- a) Rail Participant Context: Gain a comprehensive understanding of the rail participants context, including the types of operations, the technologies in use, the human elements involved, the locations, and nature of work. Consider both normal and adverse operating conditions such as degraded, and emergency operations.
- b) Regulatory and Legal Framework: Familiarise with the regulatory and legal framework governing railway operations, including national legislation, any relevant industry standards, and contractual agreements relevant to the activities and operations of the rail participant.
- c) Stakeholder Perspectives: Acknowledge and integrate the perspectives of stakeholders and interfacing rail participants that might be affected by the rail participant's activity. This includes employees and their union representatives, passengers, local communities, regulatory bodies, and emergency services, and interfacing railway participants.
- d) Risk Landscape: Assess the risk landscape by identifying existing and emerging risks associated with the rail participants activities. This should include both specific risks to the railway participant, as well as risks to those outside of the rail participants operations.
- e) Interdependencies: Identify and understand the interdependencies within the rail participants operations, including with external systems or infrastructures. Recognising these interconnections is crucial for assessing cumulative risks and systemic vulnerabilities.
- f) Complexity of Metro Areas: Recognise and address the unique complexities and risks associated with metro operating environments, ensuring that the safety risk assessment process considers the dense, dynamic, and interconnected nature of urban rail systems.
- g) Historical Analysis: Utilise historical data and experience, including past incidents and near-misses, related to the rail participants operations to inform the current understanding of risks and the effectiveness of existing control measures.

Example: A railway participant plans to undertake rail grinding on a new geographical area that includes long viaducts, tunnels and challenging terrain. The area is known to have wildly varying weather conditions. Before undertaking a safety risk assessment process, the company undertakes a comprehensive review to understand the context of their operations. This analysis includes understanding the geographical and environmental challenges, consulting with local communities to understand the environment, analysing historical safety data from similar contexts, and assessing the applicability of existing safety standards and protocols against the new context. The findings from this contextual analysis reveals a range of new unique risks to health and safety associated with the expansion of operations, including new risks of landslides, additional risks of high-winds, and new risks associated with locomotives over viaducts.

8. PRINCIPLE 2: SFAIRP as the Basis of Risk acceptance

Safety risk management should be based on the principle of 'So Far As Is Reasonably Practicable' (SFAIRP) as described in the Railways Act 2005. This principle requires rail participants to understand the severity and likelihood of their risks, the availability and suitability of control measures, and whether the cost of implementing additional control measures is grossly disproportionate to these risks.

Aim: To ensure that all risks within the railway sector are managed so far as is reasonably practicable. This involves a thorough evaluation of potential hazards, thorough evaluation of potential controls, selection and justification of appropriate and effective control measures, and the continuous monitoring and review of risk management practices.

For detailed guidance, refer to "Practical guidance for conducting health and safety assessments toward meeting SFAIRP obligations in the Railways Act"³

Considerations:

- a) SFAIRP as a Basis for Risk Acceptance: Acceptance by SFAIRP (So Far As Is Reasonably Practicable) differs fundamentally from other means, such as acceptance by a risk matrix. SFAIRP requires evaluation of whether all reasonably practicable steps have been taken to mitigate risks. This requires consideration of:
 - The likelihood and severity of risks
 - The potential ways to manage these risks
 - The availability and suitability of control measures to manage these risks
 - The costs that would be grossly disproportionate to the risks being managed

³ <https://www.nzta.govt.nz/assets/Roads-and-Rail/rail/docs/Practical-guidance-for-conducting-health-and-safety-assessments-toward-meeting-SFAIRP-obligations-in-the-Railways-Act.pdf>

- b) SFAIRP compared to a Risk Matrix: Acceptance by SFAIRP involves a context-specific analysis of what is known about the risks and how they arise and why certain controls are chosen for implementation. In contrast, a risk matrix categorises risks based on predefined severity and likelihood criteria, which can lead to high-consequence risks being accepted simply because they are scored 'low', potentially overlooking available and suitable controls that would ensure the risks are eliminated or otherwise minimised.
- c) Understanding Risks: Evaluate how risks arise, considering both known and reasonably foreseeable factors. This involves understanding the causes, contributing factors, and potential consequences of risks, including what is known and ought to be reasonably known about these risks. Knowledge about the nature of risks and how risks arise can be acquired through engaging with frontline workers, stakeholders, consulting experts, analysing incident data, reviewing industry standards, and staying updated on technological advancements and best practices.
- d) Control Measures: Evaluate current and potential control measures that could be used to control the identified safety risks. This involves considering the availability and suitability of all potential controls, including what is known and ought to be reasonably known about these controls. This knowledge can be acquired through reviewing industry standards, consulting experts, analysing incident data, engaging with stakeholders, and staying updated on advancements and best practices in safety.
- e) Cost-Benefit Analysis: For those controls that are considered both available and suitable, determine whether the cost of implementing the control is grossly disproportionate to the risk. This analysis could be done using qualitative or quantitative assessment described in the NRIAF Practical guidance for conducting health and safety assessments toward meeting SFAIRP obligations in the Railways Act.
- f) Documentation: Document the assessment of safety risks, including the hazards identified, the evaluation of risks, the consideration of control measures, and the rationale for decisions made. This should include a documented rationale justifying the selected controls and those not chosen.
- g) Periodic Review: Establish timeframes to review and update documented safety risk assessments and control measures to incorporate new information, technological advancements, and lessons learned from incidents and near-misses. This ensures ongoing compliance with the SFAIRP principle.
- h) Stakeholder Involvement: Engage relevant stakeholders, including workers, safety representatives, and interfacing participants, in the safety risk assessment process. Their input can provide valuable insights and enhance the effectiveness of risk management strategies.

Example: A rail participant is planning to repurpose a locomotive previously used for shunting operations to regularly operate on the main line in support of maintenance. The safety risk assessment process identified potential hazards including increased collision risks, higher speeds, signal sighting, and wheel-rail interface. The assessment team evaluates risks by considering the locomotive's operational capabilities and differences between the shunting yard environment and main line. They consult operational staff and engage a main-line locomotive driver to understand the risks associated with gradients. Several potential new control measures are identified, including upgrading the braking system, implementing electronic train protection, and operational limitations. Each control measure is evaluated for availability and suitability and a cost-benefit analysis determines whether the cost of each control measure is grossly disproportionate to the risk. The implementation of electronic train protection is found to be both available and suitable, with a cost that is not grossly disproportionate to the risk. This measure is selected and documented in a SFAIRP statement. Conversely, replacing the entire braking system is deemed grossly disproportionate in cost relative to the risk, instead opting to further limit the maximum speed of the locomotive so that brake performance is assured in all areas of the main line.

9. PRINCIPLE 3: The Railway Hazard Register is the Basis for Safety Risk Management

Safety risk management should utilise a railway hazard register (safety risk register) as the foundational tool for recording and communicating safety risk decisions, controls, assumptions, and the assumptions about controls provided by interfacing parties. This principle ensures a structured, transparent, and consistent approach to managing and communicating safety risks within the rail participant's organisation and between interfacing parties.

Aim: The aim of this principle is to promote the use of a consistent approach for managing identified hazards, documenting decisions, assumptions, maintaining a clear record of selected and rejected controls, and sharing information between participants. This approach aims to enhance communication, shared accountability at interfaces, and promote continuous improvement in safety risk management.

Considerations:

- a) Hazard Register: A hazard register, or safety risk register, documents the identified hazards and their causes, assesses associated risks, and records control measures to manage these risks. A register typically includes assumptions and dependencies and serves as a structured and transparent tool for documenting and communicating safety risk decisions. Interfacing parties should share their hazard registers at points of interoperability, providing clarity on shared risks and the ownership of existing controls.
- b) Comprehensive Recording: Use the hazard register to record identified hazards, associated risks, and the decisions made regarding their management. This includes documenting control measures, assumptions about interfacing parties, and any relevant contextual information.

- c) **Prioritise Death and Serious Injury:** Prioritise controlling the most serious forms of harm, such as permanent impairment, fatalities, and chronic harm. This requires a cross-functional effort between workers and their representatives, safety teams, operations staff, and management. Addressing severe harm necessitates a broader perspective beyond the daily occupational health and safety tasks, requiring recognition and management within the complexities of organisational systems.
- d) **Cross-Functional Effort:** Ensure that hazard identification and risk management involves interfacing parties to address the complexity of shared railway operations. This approach helps to mitigate risks in ways that may be overlooked when working in isolation, leading to a comprehensive safety strategy and a holistic understanding across all involved entities.
- e) **Avoid Oversimplification:** Recognise that safety risk management requires more than merely completing a railway hazard register. Emphasise a thoughtful and thorough approach that captures the complexity of the system and avoids simplistic solutions.
- f) **Communication and Accountability:** Utilise the railway hazard register as a central communication tool among all stakeholders. The Health and Safety at Work Act 2015 (HSWA) requires consultation, cooperation, and coordination among interfacing Person Conducting a Business or Undertaking (PCBU). Sharing the railway hazard register facilitates a collaborative approach to safety risk management, allowing for shared understanding and collective action to address hazards.
- g) **Philosophical Consideration:** Acknowledge that each stakeholder only ever has partial knowledge of potential safety risks and the ways of managing these risks. The railway hazard register helps facilitate a shared understanding of risk management.

Example: A rail operator plans to increase the frequency of trains on the network. The operator maintains a railway hazard register to record all identified existing and new hazards, such as reduced headway and increased wear and tear, along with the associated risks. The railway hazard register documents the control measures implemented, assumptions about the role of the access provider, and decisions made when assessing safety hazards and risks. The rail operator works closely with the access provider to identify potential additional controls that could be applied, assessing their availability, suitability, and whether the cost is grossly disproportionate to the risk. The updated railway hazard register is agreed upon between the rail participants and communicated to senior management within the rail participant organisations. Progress on implementing the additional controls is communicated between participants through regular updates.

10. PRINCIPLE 4: Methods and Models

Safety risk assessments should employ recognised safety risk assessment methods suitable for the context and complexity of railway operations and the particular risks being assessed. These methods should enable accurate identification, analysis, and management of risks, and the rationale for their selection should be appropriately documented.

Aim: To guide the selection and application of safety risk assessment processes, methods, and models to ensure the assessment of safety risks is rigorous, transparent, and adaptable to the dynamic nature of railway operations. Chosen methodologies should facilitate the effective identification of risks to health and safety and chronic harm, enable suitable quantitative or qualitative analysis of those risks, and support the development of robust safety risk management control strategies.

Considerations:

- a) Suitability to Context: To understand the nature of the risks to health and safety, choose a safety risk assessment method appropriate for the scale, complexity, and specific characteristics of the railway operation and the risks involved. This includes considering the operational environment, the nature of the risks, and the availability of data and expertise.
- b) Combination of Approaches: Recognise the value of employing a combination of quantitative, qualitative, and semi-quantitative methods to capture a comprehensive view of risks. Each approach has strengths and limitations, and their combined use can provide a more nuanced understanding of risk.
- c) Document the Choice of Methodology: Clearly document the rationale for selecting specific safety risk assessment methodologies, including the criteria and considerations that informed the choice.
- d) Transparency and Replicability: Ensure that the chosen methods and models are transparent in their application and are replicable. This allows for the validation of results and supports the continuous improvement of safety risk assessment practices.
- e) Stakeholder Involvement: Involve relevant stakeholders including workers and their representatives in the selection and application of safety risk assessment methodologies, ensuring that the methods are grounded in practical knowledge and operational realities. Stakeholder input can also enhance the acceptance and implementation of risk management measures.
- f) Alignment with Best Practice: Align safety risk assessment methods and processes with industry best practices and relevant standards. Some of the relevant standards and documents recognised by the rail industry include:
 - EN 50126 – Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS),
 - Peace, C. (2015). "Risk Assessments: Is there a Goldilocks technique?"
 - Australian Level Crossing Assessment Model (ALCAM) and Level Crossing Safety Impact Assessment Approach (LCSIAA).

- g) Review and update: Regularly review and update risk assessment methodologies to incorporate new information, emerging risk assessment practices, previous incidents, and advancements in risk assessment science and practice. This ensures that the methodologies remain effective and relevant over time.

Example: In preparing for the modification of hi-rail machinery, a railway participant evaluates several risk assessment methodologies before selecting a combination approach. The participant uses qualitative methods, including group elicitation and scenario analysis, to identify and initially evaluate potential risks associated with the changes. The rail participant then applies quantitative methods, such as fault tree analysis and event tree analysis, to those high-consequence risks to rigorously assess the likelihood and potential consequences. This combined approach enables the operator to comprehensively understand the risk landscape and develop targeted risk management strategies for the most critical risks. Throughout the process, the operator consults with system designers, operational staff and their representatives, and external safety experts to ensure the relevance and accuracy of the risk assessment.

11. PRINCIPLE 5: Review, Escalation, and Due Diligence

Safety risk management and safety risk assessments necessitate a structured approach for the communication and escalation of high consequence risks to upper management and duty holders. This allows Officers and Duty Holders to conduct their due diligence on the availability and suitability of identified safety controls.

Aim: To implement a rigorous review and approval process that ensures significant safety risks are communicated to and evaluated by upper management and Officers of the Person Conducting a Business or Undertaking (PCBU). This is designed to ensure duty holders and officers have the opportunity to gain an understanding of high-consequence risks and the effectiveness of their mitigation strategies, allowing for informed decision-making.

Considerations:

- a) Structured Communication: Establish a method for reporting safety risk assessments to upper management, focusing on risks with high consequences. This should involve a detailed presentation of the risk, its potential impact, proposed controls, those controls that were not selected, and the risk remaining after implementing all reasonably practicable control measures (SFAIRP).
- b) Escalation Procedures: Define clear procedures for escalating safety risks with catastrophic consequences to Officers. This ensures that top-level management are aware of high consequence risks, so they can engage in the due diligence process.
- c) Due Diligence by Officers: Officers of the PCBU should undertake a thorough evaluation of high consequence risks to health and safety, including assessment of the selected control measures and the rationale for the controls that were not selected.
- d) Approval Mechanisms: Formalise an approval mechanism for safety controls associated with high-consequence risks. This ensures that the selection and application of safety control measures are documented appropriately.

- e) Inspection of Safety Controls: Implement an inspection regime for the selected safety controls to ensure that they are effectively implemented and maintained over time. This verifies that decisions are translated into practice and that controls remain functional and effective in managing the identified safety risks.
- f) Review: Conduct periodic reviews of safety risk assessments to ensure they remain valid and effective. Safety risk assessments should be reviewed following any incidents, injuries, illnesses, environmental harm significant changes in operations or processes, and when new information about hazards or control measures becomes available. This practice helps to continuously update and improve risk management strategies, ensuring the ongoing safety of workers, passengers, and the public.
- g) Documentation: Maintain records of, decisions, and approvals related to the approval process. Documenting "what you knew at the time" when making safety-related decisions provides additional legal protection by showing you acted with appropriate level of due diligence with the knowledge at hand.

Example: In response to a safety risk assessment that revealed a catastrophic risk associated with a new rail construction project near a residential area, the process of escalation to PCBU Officers is initiated. A detailed report is prepared and presented to the Officers that outlines the risk, proposed mitigation measures, and the safety risks that remain after implementing all reasonably practicable control measures. They engage in a due diligence process, examining the proposed controls' alignment with best practice and legislative requirements, the potential impact on community safety, and the measures' sustainability over the project's lifespan. Following a comprehensive review, the Officers provide feedback, suggesting enhancements to the communication plan with the community and requesting additional emergency response preparedness measures. The approval of the risk mitigation measures, contingent on these enhancements, ensures that the project proceeds with a robust safety framework, directly overseen by the highest levels of management.

12. PRINCIPLE 6: Engagement and Consultation

Safety risk management and safety risk assessments should ensure meaningful engagement and consultation with all potentially affected parties, including workers, safety representatives, management, interfacing parties, and, where applicable, the public. This process should involve these stakeholders in a manner where their perspectives are considered and documented, emphasising the importance of their participation throughout the assessment.

Aim: To facilitate an inclusive process where stakeholders are actively involved in identifying, assessing, and managing safety risks. This collaborative approach is designed to leverage diverse insights and expertise, contributing to more comprehensive and effective risk management strategies.

Considerations:

- a) **Participation:** Ensure the participation of all relevant stakeholders, particularly those directly affected by the rail participants activities. This includes safety representatives, unions, management, external parties, interfacing rail participants, and contractors. Additionally, identify and engage relevant non-rail participants who have a stake in railway safety, such as road controlling authorities, adjacent property owners, industry groups, unions, emergency services, regulatory bodies, and public interest groups.
- b) **Effective Communication:** Establish clear communication to enable stakeholders to share their knowledge, concerns, and suggestions regarding safety risks and their management.
- c) **Feedback and Response Mechanisms:** Implement mechanisms for collecting and addressing feedback from stakeholders throughout the risk assessment process. This ensures that stakeholder inputs are not only heard but also acted upon, fostering a culture of mutual respect and continuous improvement.
- d) **Documentation and Transparency:** Maintain comprehensive records of engagements and consultations, including the concerns raised and how they were addressed. This documentation supports transparency and accountability, providing a clear audit trail of how stakeholder input has influenced risk assessment outcomes.
- e) **Education and Awareness:** Provide stakeholders with the necessary information and training to understand the risks, controls, and the risk assessment process itself. This empowers stakeholders to contribute effectively to discussions and decisions.

Example: Workers from two different PCBU's in Wellington were concerned about the risk of collision whilst shunting across a public level crossing. The workers documented the number of near misses with road vehicles whilst shunting across the level crossing and asked their union to write to the respective PCBU's and other stakeholders, including the regional council and regulators, to outline their concerns. A collaborative safety risk review was carried out involving all parties, where the risks were discussed, and a wide range of safety controls were explored and assessed for suitability and availability. The PCBU's and the worker representatives agreed to the implementation of the chosen controls, while an interim solution of a different shunting arrangement was chosen to minimise the safety risks to health and safety until the permanent solution were implemented.

13. PRINCIPLE 7: Qualifications and Experience

Safety risk management and safety risk assessments should be led by individuals who are determined by duty holders within the rail participant organisation to hold the necessary qualifications and experience to assure the integrity and effectiveness of the risk management process.

Aim: To ensure that safety risk assessments are carried out by personnel with the appropriate expertise, knowledge, and skills. This is to ensure that the assessments accurately reflect potential hazards, adequately evaluate the risks, and identify effective control measures.

Considerations:

- a) **Determining Appropriate Skills and Expertise:** Duty holders should identify and ensure that individuals undertaking safety risk assessments possess the necessary skills and expertise. This includes being satisfied with their professional qualifications, practical experience, and any specialised training in rail safety and safety risk management to ensure the integrity and effectiveness of the risk management process.
- b) **Qualifications and Experience:** To carry out risk assessments, it's essential for individuals to have either appropriate professional qualifications, hands-on experience, or ideally a combination of both. Professional qualifications can include formal education, professional certifications, and specialised training in rail safety and risk management. Practical experience, in contrast, refers to direct involvement in the rail industry or similar sectors, providing in-depth knowledge of rail operations, potential risks, and the effectiveness of control measures, typically under the supervision of someone with significant experience. Combining both qualifications and practice helps to ensure that risk assessments are well-informed by both theoretical knowledge of risk management and practical understanding of the operational context.
- c) **Continuous Professional Development:** Encourage and support ongoing learning and professional development for those involved in risk assessments. Keeping up to date with the latest risk management techniques, industry standards, legislative changes, and recent incidents and events on the railway ensures that risk assessments are both current and comprehensive.
- d) **Cross-Disciplinary Knowledge:** Recognise the value of cross-disciplinary knowledge in enriching the risk assessment process. Involving experts from different areas (e.g., engineering, human factors, environmental science) can provide a more holistic view of risks and controls.
- e) **Peer Review:** Implement a process for peer review or oversight by more experienced professionals. This can provide an additional layer of scrutiny and quality assurance, ensuring that risk assessments are robust, credible, and aligned with best practices.

Example: A rail participant is planning to conduct a risk assessment for operating beyond their current geographical boundaries. The team assembled for this task includes individuals with a blend of qualifications and experience, including a safety engineer with over a decade of experience in rail safety, a human factors specialist, and an environmental consultant. Before finalising the risk assessment, it undergoes a review by an external expert in similar rail operations to ensure comprehensiveness and accuracy.

14. PRINCIPLE 8: Legal Obligations

Railway participants should ensure that safety risk management, including risk assessments, complies with the Health and Safety at Work Act 2015, the Railways Act 2005, and other applicable New Zealand laws and regulations. Adherence to legislation forms the foundation for the safety of all rail activities.

Aim: To ensure that the management of safety risks in the railway sector is aligned with legal requirements, rail participants should not merely aim for compliance but strive for improved safety performance above the minimum requirements. This includes understanding and applying the provisions of the Railways Act, the Health and Safety at Work Act (HSWA), and other relevant legislation, regulations, and industry standards appropriate to the railway participant's context.

Considerations:

- a) **Legal Knowledge:** Individuals responsible for undertaking safety risk assessments should have, or have access to, understanding of the legal and regulatory landscape affecting railway operations in New Zealand. This includes familiarity with specific obligations under the Railways Act, HSWA, and any relevant environmental and occupational health and safety regulations, specifically the requirement to eliminate and minimise the risks of death and serious injury 'so far as is reasonably practicable'.
- b) **Integration of Legal Requirements:** Risk assessment processes should explicitly consider legal obligations as a key component of identifying and evaluating risks, and in determining appropriate control measures. Legal compliance should be a minimum standard, with the aim to exceed these requirements where practicable.
- c) **Documentation and Evidence:** The individuals undertaking risk management and safety risk assessment activities should maintain thorough documentation of how legal obligations have been considered and addressed in the risk assessment process. This should include evidence of compliance with specific legal requirements, decisions made regarding risk controls, and how these decisions align with the principles of 'so far as is reasonably practicable'.
- d) **SFAIRP Statements:** There may be a need to document a "So Far As Is Reasonably Practicable" (SFAIRP) statement related to specific or unique risks, or where there is specific interest in the justification of the selection of safety controls. The purpose of the SFAIRP statement, sometimes referred to as a SFAIRP argument, is to document and communicate controls related to a specific risk to health and safety. A SFAIRP statement outlines each component of the 'reasonably practicable' test by providing a thorough assessment of what is known and 'ought reasonably be known' about the risks to health and safety, an assessment of control measures that are known and 'ought to reasonably be known', assessment of suitability and availability and cost/benefit of those control measures, specifically including justification for the control measures that were not selected. Practical guidance for the assessment of safety risks 'so far as is reasonably practicable' is available on the NZTA website.⁴

⁴ <https://www.nzta.govt.nz/assets/Roads-and-Rail/rail/docs/Practical-guidance-for-conducting-health-and-safety-assessments-toward-meeting-SFAIRP-obligations-in-the-Railways-Act.pdf>

- e) Regular Updates and Reviews: The individuals undertaking risk management and safety risk assessments should stay informed of changes in the legal and regulatory environment, and regularly review risk assessments and management practices to ensure ongoing compliance. This includes adapting to changes in law, regulations, and standards that may affect railway safety and operations.
- f) Engagement with the Regulator and those with regulatory responsibilities: The individuals undertaking risk management and safety risk assessments should foster open and proactive engagement with the regulator and those who represent the regulator's interests within the access providers, licence holders, and interfacing participants. This engagement can provide valuable insights into safety risk management expectations, emerging trends, and best practices.

Example: In conducting a risk assessment for the deployment of new rolling stock, the project team undertakes a review of all applicable legal requirements as a core component of the assessment process. This review identifies specific obligations under the Electricity Act regarding electrical safety, as well as changes to WorkSafe guidelines affecting worker and public safety for dust and noise. The team documents how each newly identified requirement is addressed through the proposed design and operational procedures, ensuring that the project meets the legal requirements. For the unique risks, a "So Far As Is Reasonably Practicable" (SFAIRP) statement is completed to justify the selected controls which were chosen and which were not chosen, demonstrating that all identified risks are managed so far as is reasonably practicable.

15. PRINCIPLE 9: Shared Language

Terminology, definitions and communication protocols used in safety risk assessments should be standardised. This is crucial for ensuring clear communication, mutual understanding, and effective collaboration across all levels of railway operations.

Aim: In order to ensure effective communication and understanding among all stakeholders involved in the railway system, a consistent set of terms and definitions needs to be used. This shared language aims to eliminate ambiguities and misunderstandings that can compromise safety outcomes.

Considerations:

- a) NZ Rail Terminology: It is important to ensure the terms used in safety risk management align to New Zealand industry norms. In efforts to promote understanding between participants, safety risk assessments should include a glossary of acronyms and rail specific terms and their definitions. For example, a safety case in the New Zealand Railway sector is significantly different from other sectors and countries. This glossary should be accessible to all interfacing rail participants.
- b) Common Terminology: Where possible, align terminology to well established definitions including legislation and international standards such as ISO 31000 (Risk Management). This promotes consistency when interacting with interfacing participants.
- c) Inclusive Development: Engage interfacing participants and stakeholders in the development of definitions and terminology to ensure a common understanding in safety risk management. If you are unsure about terminology used, ask.

- d) Regular Review: Recognise that language evolves, and so check and confirm definitions with interfacing parties when reviewing risk management documentation. This helps ensure there is a common understanding.
- e) Training and Awareness: Encourage the consistent use of standardised terminology in all forms of communication, including meetings, reports, safety documentation, and training materials. Providing a list of definitions and acronyms used is encouraged.

Example: A railway company initiates a project to update its safety management system documentation. As part of this project, a cross-functional team is formed to review and standardise the terminology used across different departments. The team reviews international standards, engages with frontline employees to understand operational language, and develops a glossary that is incorporated into the safety management system. Training sessions include a glossary of common terms to promote a common understanding.

16. PRINCIPLE 10: Interfacing Participants

Safety risk assessments and management practices should document the responsibilities of interfacing participants. This framework should ensure that all responsibilities related to risk identification, assessment, mitigation, and monitoring are clearly defined, understood, communicated, and executed. This helps in fostering a culture of accountability for safety risk management.

Aim: To ensure interfacing participants involved in safety risk management are fully aware of their responsibilities and are accountable for fulfilling them, ensuring effective management of risks throughout the railway system.

Considerations:

- a) Roles and Responsibilities: Document and communicate the specific safety risk management roles, responsibilities, and authority levels of all stakeholders within the railway operations. This clarity helps prevent overlaps and gaps in safety responsibilities.
- b) Formal Agreements: Where risks are shared between railway participants, formalise the allocation of safety responsibilities through written agreements, such as contracts, memorandum of understanding, or safety management plans. These agreements should detail the expectations, deliverables, and accountability measures specifically related to managing interfacing risks.
- c) Measurement and Reporting: Establish processes for monitoring and reporting on safety responsibilities, including shared interfacing risks. This includes communicating the results of safety audits, inspections, and reviews, with findings reported to the relevant levels of management and stakeholders.
- d) Compliance: Develop processes to ensure compliance with risk management responsibilities, including addressing non-compliance constructively.
- e) Recognition and Reinforcement: Foster a positive safety culture by recognising and rewarding performance in safety. Celebrate successes and share best practices to reinforce the value of accountability in achieving safety objectives.

- f) Continuous Improvement: Encourage a proactive approach to safety management, where stakeholders take ownership of their responsibilities and are motivated to identify and implement improvements in safety practices.
- g) Clarity of Interfacing Risks: Where one rail participant creates a risk which has the potential to impact other rail participants, the participants must co-operate to eliminate or minimise the risk to the extent that they have control of the risk.

Example: A railway infrastructure owner embarks on an upgrade involving multiple designers and contractors. Before design and construction work begins, the rail infrastructure owner outlines the safety responsibilities of each designer and contractor and interfacing participant. This includes specifying who is responsible for design-for-safety, safe work, assurance that the construction conforms to the design, and is tested and checked before being introduced to service. The railway infrastructure owner leads joint reviews of the design hazard log, joint reviews of the safe work method documentation, joint inspections of the worksites, and collaborative review of the assurance evidence that the constructed infrastructure meets the design and is tested appropriately. The results are discussed in regular joint safety risk management meetings with interfacing participants. This structured and collaborative approach ensures that each party understands their safety responsibilities and accountabilities, leading to a collaborative and proactive safety management effort throughout the project.

17. PRINCIPLE 11: Conflict Resolution

Safety risk assessments and management practices should include structured mechanisms for promptly and effectively addressing and resolving disagreements. This ensures that any disagreements about safety risk assessments, control measures, or risk management responsibilities are resolved in a manner that prioritises safety outcomes.

Aim: To ensure that conflicts related to risk assessment and management are resolved in a manner that maintains the integrity of the risk management process and prioritises safety.

Considerations:

- a) Open Communication: Having established relationships across the NZ rail industry helps resolve difficult issues when they emerge. Maintain open lines of communication that encourage stakeholders to voice safety concerns, disagreements, or conflicts about safety risk management without fear of retaliation. This openness fosters a culture of trust and transparency.
- b) Structured Resolution: When issues are difficult to resolve and discussions become unproductive, document both sides of the issue before escalating within your organisation. Providing senior management with multiple perspectives on the issue can help them resolve it more quickly.
- c) Mediation and Facilitation: Consider neutral third parties to help resolve disagreement in safety risk management. These individuals can assist in finding mutually acceptable solutions and maintaining objectivity.
- d) Focus on Interests, Not Positions: Encourage parties involved in a disagreement around how safety risk is managed to focus on underlying interests and safety outcomes rather than entrenched positions or risks of precedent. This approach facilitates more flexible and creative solutions.

- e) Documentation and Learning: Record the details of disagreement and their resolutions to identify patterns, underlying causes, and opportunities for improvement in the safety management system. Sharing lessons learned from disagreements in safety risk management contributes to continuous improvement.
- f) Training and Support: Provide training and resources to interfacing participants and stakeholders to support their understanding. Equipping individuals with the right skills can prevent conflicts from escalating and ensure they are resolved more efficiently.

Example: During the implementation of a new safety protocol, a disagreement arises between the engineering department and operational staff regarding the feasibility of certain control measures. Recognising the potential impact on safety and morale, management initiates a structured workshop involving representatives from all parties. Through facilitated discussions, it becomes evident that both parties share a common goal of enhancing safety but have different concerns about the implementation. By focusing on these shared interests, they collaboratively adjust the protocol to address both feasibility concerns and safety objectives, strengthening the team's commitment to the safety management process.

18. Development

This guideline was developed by the National Rail Industry Advisory Forum. It has been provided in good faith and with no warranty whatsoever. Comments and suggestions are welcome.

Definitions & Terms

The definitions of the Railways Act apply. The following terms are used in this document and their meaning is provided:

Term	Meaning
Hazard Register	A hazard register, sometimes referred to as a safety risk register, is the foundational document for recording and managing safety risks. This log documents identified hazards, associated risks, control measures, and any assumptions about interfacing parties' controls.
HSWA	Health and Safety at Work Act (2015)
ISO	International Organization for Standardization
Interfacing Railway Participant	Any individual, organisation, or entity directly involved or connected with the railway industry, particularly those who interact or collaborate with each other at different points along the railway system. A rail participant is defined in the Railway's Act and means any infrastructure owner, rail vehicle owner, railway premises owner, access provider, rail operator, network controller, railway maintenance provider, railway premises manager, or any other class of person prescribed as a rail participant by regulations.
Normal, Degraded, and Emergency Situations	"Normal" refers to regular or routine operation, "degraded" refers to a state where some aspect of the system or operation is not functioning as intended, and "emergency" refers to a situation that requires an immediate response.
NRIAF	National Rail Industry Advisory Forum
Operational Context	Operational context refers to the specific conditions and circumstances in which a particular operation or activity is taking place. This includes factors such as the environment, equipment, procedures, personnel, and organisational culture that may influence the health and safety risks associated with the operation. The operational context helps to provide a clear understanding of the unique hazards and risks that are present in a particular situation, and it is important to consider this context when conducting a safety risk assessment.
RAMS	Reliability, Availability, Maintainability, Safety
Principle	A fundamental truth or proposition that serves as the foundation for a system of belief or behaviour or for a chain of reasoning.
Rail Personnel	Rail personnel, as defined in the Railways Act and in relation to a rail participant, means an individual engaged by the rail participant or by an agent or contractor of the rail participant, whether as an employee, agent, contractor, or volunteer, for the purposes of carrying out, or assisting in carrying out, rail activities for the rail participant.
Reasonably Practicable	The term "reasonably practicable" is defined in the act as meaning that which is, or was, at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters. In particular, the Railways Act requires that rail participants must ensure, so far as is reasonably practicable, that none of the rail activities for which it is responsible causes, or is likely to cause, the death of, or serious injury to, individuals.:
Risk Assessment	A systematic process of evaluating the potential risks that may be involved in a projected activity or undertaking
PCBU	Person Conducting a Business or Undertaking. It is a legal term from the Health and Safety at Work Act (HSWA) 2015.

References

- A. Health and Safety at Work Act 2015.
- B. Railways Act 2005.

Bibliography

- A. International Electrotechnical Commission (IEC). EN 50126: Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS).
- B. International Organization for Standardization (ISO). ISO 31000: Risk Management - Guidelines.
- C. International Organization for Standardization (ISO). ISO 45001: Occupational health and safety management systems - Requirements with guidance for use.
- D. National Rail Industry Advisory Forum (NRIAF): Practical guidance for conducting health and safety assessments toward meeting SFAIRP obligations in the Railways Act.
<https://www.nzta.govt.nz/assets/Roads-and-Rail/rail/docs/Practical-guidance-for-conducting-health-and-safety-assessments-toward-meeting-SFAIRP-obligations-in-the-Railways-Act.pdf>
- E. Peace, C. (2015). Risk Assessments: Is there a Goldilocks technique.
https://www.riskmgmt.co.nz/fileadmin/documents/Risk_techniques_working_paper.pdf
- F. Safety Institute of Australia. Guidance on Developing a Safety Management System.
- G. WorkSafe New Zealand. Guide to the Health and Safety at Work Act 2015.