Work Health and Safety (WHS) Risk Management

Purpose

This document defines the principles and methodology for WHS risk management and outlines minimum requirements for:

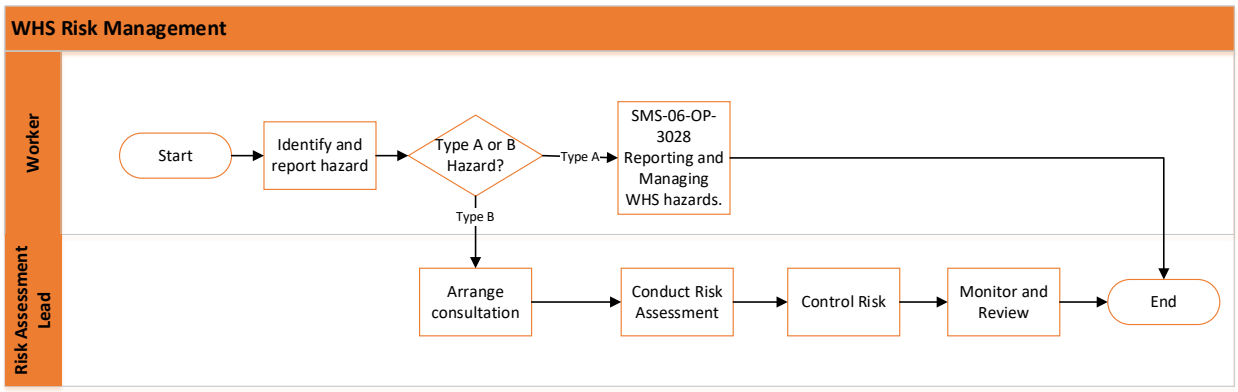
- the systematic, structured and timely approach to hazard[1] identification and risk assessment(s);
- implementation of control measures in-line with the *hierarchy of control* methodology; and
- monitoring and reviewing the effectiveness of corrective actions following the elimination or control of hazards.

Scope

This document defines the relevant WHS risk management processes that are prescribed in the National *Self-Insurers OHS Audit Tool* (NAT), NSW Work Health and Safety (WHS) legislation and *ISO 31000*: *Risk management – Guidelines*. In addition, this procedure is aimed at supporting risk management system documentation housed in the Sydney Trains' Risk Management Portal.

As a minimum, the risk management approach shall be used when:

- designing a new or modified process or activity, plant, equipment, tooling, facility;
- procuring and starting a new business, initiative, strategy or project;
- new information relating to workplace risks becomes available;
- when legislation changes;
- responding to an occurrence or event demonstrating that a control is not working as planned;
- responding to concerns raised by workers, health and safety representatives or others at the workplace and
- amending and/or reviewing work practices, procedures or the work environment.



Process description

1. Arrange consultation on Risk Management

Line Manager(s) or person (s) involved with leading/conducting risk management activities shall consult with **workers** about matters affecting their health and safety when:

- risks to health and safety arising from work are assessed or when the assessment of those risks are reviewed;
- decisions are made about the measures to be taken to eliminate or control those risks;
- decisions are made about the adequacy of facilities for the welfare of workers; or
- changes that may affect health, safety or welfare are proposed to the premises where persons work to the systems or methods of work or to the plant or substances used for work.

There are two types of hazards:

- ***Type A 'temporary' hazards*** (e.g. wet floors, blocked fire exits and damaged furniture etc.) that are ad-hoc, temporary in nature and can be resolved with minimal effort/investment/control implementation. These hazards are not subject to risk assessments and are recorded as 'Unsafe Acts' and 'Unsafe Conditions' in SHEM if not related to a Sydney Trains Asset. Hazards relating to a Sydney Trains Asset should be recorded in *EAM/FMS (defect*).
- ***Type B 'enduring' hazards*** are typically identified through planned verification activities (e.g. workplace inspections) and recorded in Risk Registers as the outcome of a Risk Assessment. These types of hazards are risk assessed using SMS-06-FM-4107 WHS Risk Assessment Form.

Note: Consultation with workers and/or their health and safety representatives is required at each step of the risk management process, ***so far as is reasonably practicable***. This is particularly important as consultation draws on the worker's experience, knowledge and ideas, which promotes the identification of hazards and choosing effective control measures.

2. Identify Hazard(s)

The next step in the risk management process is hazard identification, as hazards cannot be assessed or controlled if they have not been identified in the first instance. Hazard identification is an ongoing process and **Workers/Line Manager(s) or person (s) responsible to conduct risk management activities** shall manage this process through:

- assessing high-risk issues identified through risk profiling activities or as reported hazard/occurrence;
- regulatory risk assessments, including plant, manual tasking, confined space and workplace chemical risk assessments;
- assurance and/or verification activities e.g. audits, workplace inspections and/or safety interactions;
- task-specific hazard identification through Job Safety Analysis (JSA) and Safe Work Method Statements (SWMS);
- data analysis e.g. review of safety performance statistics;
- when change(s) that may impact on health and safety are planned; and/or
- prior to introducing new substances, plant and equipment (including information provided by the relevant suppliers and manufacturers).

Identification of hazards, as a minimum, should consider:

- the situation, events or a combination of circumstances that, if not addressed, have the potential to cause injury, illness and have a negative impact on the environment;
- the nature of potential injury, illness or environmental impact that is relevant to the activity, product or service;
- past injuries, incidents and illnesses; and
- Legislative requirements and advisory materials such as Codes of Practice, Standards and Guidance material.

Sources of hazards that shall be considered (but not limited to) are shown in the following table:

Hazard Aspect (where to look)	**Hazards to consider during the hazard identification process (what you might find)**	**Potential harm examples** (Source: How to manage WHS risks Code of Practice)**.**
Work Premises	Access/Egress, Layout and condition, workstation design, lighting conditions, suitability of furniture/equipment and cramped working conditions, fire, bomb threat or other threatening situation, medical emergency; materials of construction e.g. asbestos.	Inappropriate lighting can cause eye strain. Exposure to friable asbestos may result in mesothelioma (type of lung cancer).
Physical Working Environment	Electricity, pressure, confined spaces, working at height/depth, confined spaces, fire or explosion, slips/trips/falls, workplace violence, weather conditions, contact with moving or stationary objects, exposure to dust/fumes/ vapour/ noise/ heat/ cold/ vibration/ radiation/static electricity or contaminated atmospheres, company vehicle involved in an accident. **Note:** refer to *Section 3.4* and *Appendix C* in the *Confined Spaces Code of Practice* to support risk assessments involving Confined Spaces and *Section 2.2* in the *Welding Processes Code of Practice* to support risk assessments relating to 'hot works'.	Falling objects, falls, slips and trips of people can cause fractures, bruises, lacerations, dislocations, concussion, permanent injuries or death.
Work Practices, Work Systems and Shift Working Arrangements	Hazardous processes, psychological hazards, fatigue-related hazards, training, skills, experience, level of supervision, emergency planning arrangements, injury recovery, occupational violence	Effects of work-related stress, bullying, violence and work-related fatigue.
Plant and Equipment	Transport, installation, erection, commissioning, use, repair, maintenance, dismantling, storage or disposal of plant, unplanned and uncontrolled energy release, rotating equipment, vehicle movement, working outside technical specifications, plant not used for intended purpose	Being hit by moving vehicles, or being caught by moving parts of machinery can cause fractures, bruises, lacerations, dislocations, permanent injuries or death.
Workplace Chemicals	Production, handling, use, storage, transport or disposal, spillage, hazardous chemical leak	Leakage of chemicals (such as acids, hydrocarbons, heavy metals) can result in environmental contamination.

Hazard Aspect (where to look)	Hazards to consider during the hazard identification process (what you might find)	Potential harm examples (Source: How to manage WHS risks Code of Practice).
		Inhaling dusts (such as asbestos and silica) can cause respiratory illnesses, cancers or dermatitis.
Biological Organisms, Products or Substances	Exposure, storage, handling, use, transport or disposal	Micro-organisms can cause hepatitis, legionnaires' disease, Q fever, HIV/AIDS or allergies
Manual Tasks	Actions, movements, workplace/workstation layout, posture, duration and frequency of manual handling. **Note:** *Section 3* and *Appendices C, D and F in* the *Hazardous Manual Tasks Code of Practice* can be used to support risk assessments involving Hazardous Manual Tasks.	Overexertion or repetitive movement can cause muscular strain

Determination of potential harm should be evaluated with consideration of the **expected** potential harm/consequence with consideration of existing controls. The following provide some examples of hazards:

- electricity may result in electric shock [if controls such as Residual Current Devices (RCD) are in place] or electrocution [in the absence of any control]
- rotating equipment may result in amputations (no machine guarding) or near-miss (no proximity sensors).

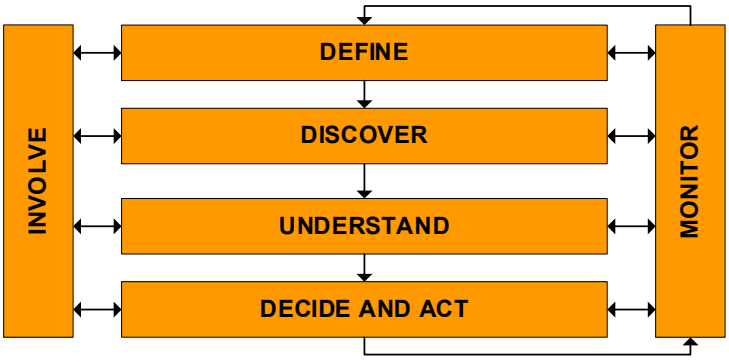
Note: Hazard reporting contributes to a safer working environment. Based on this principle, all occurrences and activities *that arise from any undertaking by Sydney Trains* should be reported.

Sydney Trains endorsed and authorised on-line reporting processes **shall** be used where online access is available. For the most part, this involves reporting hazards through SHEM.

3. Conduct Risk Assessment

Line Manager(s) or person (s) responsible to conduct risk management activities shall ensure that *all* the information shown in the SMS- 06-FM-4107 WHS Risk Assessment Form is filled out.

The following diagram shows the Risk Assessment framework and associated steps that are aligned with *ISO31000:*



Step	Activity	Key Points
3.1	**Involve**	• The management of risk starts by identifying the stakeholders who should be involved; • Understand their objectives, what they know and how to involve and collaborate with them during each step in the process to source information and manage any potential for bias; and • Develop a plan to continue to involve and collaborate with the stakeholders throughout the risk management process.
3.2	**Define**	• Working with stakeholders, define the decision the risk assessment is supporting and what you are aiming to achieve; • Consult stakeholders and confirm the scope of the risk assessment; • The scope shall influence your understanding of the consequence and likelihood of each risk event e.g. if a scope relates to a particular work process(es); and • Generate a list of hazards (or sources of uncertainty) – the list shall provide a structure to support the discovery of risks.
3.3	**Discover**	• Continue to work with stakeholders and document what might happen in the future and what it might lead to (i.e. the outcome). These are your risk events; • The outcome of a risk event may be negative or positive (i.e. an opportunity); • Describe each risk event as an event in the future using the format: '(Something occurring) leading to…..(a consequence)'; • Explore what might cause the risk event to happen – what could cause us to lose control of the hazard? • Structure your approach to avoid missing any events by referring to the sources of uncertainty developed in 'Define'. Some questions to consider are what can go wrong, how could it happen, what are the contributing factors, what has happened in the past and could it happen again on this job?
3.4	**Understand**	• Understand the significance of each risk event to determine and prioritise action; • Identify the current suite of controls that act upon the causes and seek to mitigate the consequences of the risk event; • Use the information contained in **Figures 1 - 2** to guide effectiveness assessments of the current suite of controls; • Once the current suite of controls and their effectiveness is understood, the **Level of Risk** can be determined; • With reference to experience, subject matter expertise and operating history, consider the effectiveness of the existing controls and select from the Injury and Illness Consequence Scale, the consequence description that best fits the **Expected Consequence** for the risk event (considering all potential consequence types e.g. safety, environment, reputation and/or financial); • Next, determine the likelihood of the **Expected Consequence** occurring. To do this, confirm the context of the assessment (as the context shall influence the estimation of the likelihood rating). Understand our history, the last time a similar incident occurred and the effectiveness of current control suite and apply this knowledge to estimate the likelihood of the expected consequence using the **Likelihood Rating** in **Figure 3;** • To further develop your understanding of the risk event, refer to the Consequence Rating Scale in **Figure 4** and with reference to experience and subject matter knowledge select from, the consequence descriptor that best fits the plausible worst case consequence for the risk event (the maximum impact on the business arising from the risk event). This is the **Plausible Maximum Outcome;** and • Combine the expected consequence and the likelihood of the expected consequence occurring in **Figure 4** to determine the **Level of Risk** (this is the residual level of risk as it acknowledges the effectiveness of the current control suite).
3.5	**Decide and Act**	• Decisions to act to address a risk event involve comparing the 'total cost of the risk' against the 'cost of the control'. One exception is prescriptive legislation why may over-ride any cost-benefit analysis and may impose the business to adopt particular controls; • Cost in both cases may go beyond pure monetary value in order to understand the net business benefit of action. • With an understanding of each risk event, the causes and effects of the existing controls:

Step	Activity	Key Points
		○ explore the characteristics of the risk event including the causes and consequences and seek options that act against leading causes and/or the consequences; ○ explore options to improve the design and operating effectiveness of existing controls or the design of new controls where a control gap has been identified. • Where a decision to act is taken, document the control (its purpose and design intent), those accountable, allocate resources, agree deadlines, and how those accountable shall demonstrate that the control is operating as intended when required; • As the action is implemented, continue to monitor and assess (update) the control effectiveness rating for the risk event.
3.6	**Monitor**	• It is important to regularly monitor and review the effectiveness of current controls to ensure they are fit-for-purpose and continue to work as intended. Consider if current controls still treat root causes of the known risk events and if there are any new risks that have been introduced that are currently not being treated; • With limited time and resources available, monitoring activities should be prioritised to focus on the most critical controls i.e. controls that are the most effective in treating root causes and reducing the highest level of exposure and risk; • Some examples of monitoring activities include the observation of personnel or procedures, analytical review, inquiries or interviews with relevant personnel, review of periodic reporting, testing of controls and conducting of audits; and • Information produced from monitoring activities can be useful in providing learnings and feedback on whether control effectiveness ratings require any adjustment, if there is a need to implement additional controls to reduce the level of risk and opportunities to improve controls to enhance operational discipline and reliability.

Effectiveness Rating	Description
Effective	The control is designed to fully mitigate the risk or meet the obligation to which it is associated to. The control is applied correctly and is operating as intended for the majority of the time. Overall the control is adequate to help prevent, detect or correct the risk or meet the obligation. (Guide: 90-100% effective).
Partially Effective	The control design partially meets the control objective and is generally operational but on occasion is not applied as intended. Significant control weaknesses have been identified. (Guide: 50-90% effective).
Ineffective	The control does not meet the control objective and is not applied correctly. The control is inadequate and will not be able to help prevent or correct the risk or meet the obligation. (Guide: 0-50% effective).
Unassessed	The control has not been evaluated.

Figure 1: Control Effectiveness Rating. Note: the effectiveness rating principles have been sourced from the Sydney Trains' RM-GD-06 Control Management Standard located in the *Risk Management Portal* and should subsequently be referred to for detailed guidance relating to risk control assessments.

Design Effectiveness	When determining whether the control is fit for purpose, consider the following factors: • How well the control is embedded within day-to-day operations and whether it is designed to be performed the same way each time. • That there is a formal ownership of the control and control performer who has adequate skills to perform the control. • That there is documentation that describes the purpose of the control and how it is performed.
Operational Effectiveness	<table><tr><th>Testing Technique</th><th>Description</th><th>Level of Assurance</th></tr><tr><td>Re-performance</td><td>This involves an independent party following the same steps in performing the control.</td><td>High</td></tr><tr><td>Inspection</td><td>This involves the inspection of evidence and relevant source data to validate that the control steps where correctly executed</td><td>High</td></tr><tr><td>Observation</td><td>This approach involves observing the operation of the control in practice</td><td>Moderate</td></tr><tr><td>Inquiry</td><td>Obtaining information to understand how the control is performed and evaluating the responses to validate the control performance</td><td>Low</td></tr></table>

Figure 2: Assessing the Operating Effectiveness sourced from the RM-GD-06 Control Management Standard**.**

Likelihood			Negative Consequences						Rating
Qualitative	Probability (per annum)	Frequency (on boundary choose higher rating)	C1	C2	C3	C4	C5	C6	
Frequent (Occurs often)	95% or greater probability of occurring	More than once a month	C	B	B	A	A	A	L6
Probable (Likely to Occur)	>60% probability of occurring	Between once a month and once a year	C	C	B	B	A	A	L5
Occasional (Could occur but more than likely it won't)	20% to 49% probability of occurring	Between once every year and once every 10 years	D	C	C	B	B	A	L4
Remote (May occur only in unusual circumstances)	1% to 19% probability of occurring	Between once every 10 years up to once every 100 years	D	D	C	C	B	B	L3
Improbable (Would only occur under exceptional circumstances)	Less than 1% probability of occurring	Between once every 100 years up to once every 1000 years	D	D	D	C	C	B	L2
Incredible (Not expected to occur)	Not expected to occur	Less than once every 1000 years	D	D	D	D	C	C	L1

Figure 3: ***Risk Rating*** **table showing 'Negative Consequences'.** **Note:** all risk ratings need to be in accordance with the identifiers in this table and further detail on risk ratings should be accessed from the Sydney Trains' Enterprise Risk Management Risk Ranking Table.

Consequence Type	Negative Consequences					
	C1	C2	C3	C4	C5	C6
	Insignificant	Minor	Moderate	Major	Severe	Catastrophic
Safety / Health (Staff, Contractors, Customers and Community) as defined under section 36 of the Work Health and Safety Act 2011 (WHS Act) Note: Potential multiple injuries to an individual during a single event, only count as a single injury. Injury to be rated at the highest consequence for that event. **Prompts** Collisions, Derailments, Terrorism, Cybersecurity, Vandalism with injury potential, Assault, Staff Accidents	Injury / illness not requiring first aid or medical treatment. May require up to 3 days off work	Injury or illness, requiring first aid or medical treatment (non-hospitalisation). May require 4 - 14 days off work	Injury or illness, requiring hospitalisation. May require >14 days off work	2 to 9 injuries or illnesses, requiring hospitalisation.	Single fatality (and / or) 10 to 19 injuries or illnesses requiring hospitalisation.	Multiple fatalities (and / or) 20 or more injuries or illnesses requiring hospitalisation.

Figure 4: Sydney Trains *Negative Consequence Type* rating for Safety and Health related consequences. Further detail on consequence types and ratings should be accessed from the Sydney Trains' Enterprise Risk Management Risk Ranking Table.

Guidance Note: While not a legislative or organisational mandate, *risk assessments should be reviewed at a frequency that is commensurate to the presented risk*. For example, risk assessments that have identified critical risk exposure should be reviewed every two years at a minimum and generic risk assessments should be reviewed every five years at a minimum.

4. Control the Risk (s)

The objective of controlling risks is to eliminate or minimise risk to the lowest reasonable and practical level. With this in mind, where risks cannot be eliminated; **Line Manager(s) or person (s) responsible to conduct risk management activities** shall use the hierarchy of control principles (shown below) to minimise risk to the lowest level that is reasonably practicable.

Type of control	How it controls risk
1. Elimination	Physically remove the risk e.g. replace level crossing with a bridge
2. Substitution	Physically replace the risk / when something less hazardous is used to control the risk e.g. water-based cleaning chemicals rather than solvent-based ones.

	How it controls risk
	Isolate through engineered measures or when barriers are used to shield or isolate the hazard e.g. machine guarding, signal interlocking, electrical isolation, install an exhaust ventilation system to extract fumes or dust.
4. Administrative **Note:** refer to SMS-06-OP-3043 Managing Risks Using Safe Work Practices for information relating to Safe Work Method Statements (SWMS) and Safe Work Instructions (SWIs).	When you administrate or use procedural controls e.g. ▪ re-arrange work to reduce the time people are exposed to the hazard; ▪ use job rotation to reduce exposure; ▪ change the timing of the work activity so that fewer workers are exposed; ▪ routine maintenance and housekeeping procedures; ▪ training on hazards and correct work procedures; ▪ developing new or different systems of work.
5.Personal Protective Equipment (PPE)	PPE does not address controlling the source of the hazard, exposure or risk, and this is the reason why it is low on the hierarchy.

Note: In situations where risk cannot be eliminated, the most effective way to control risk is to control the hazard at its source. This can be achieved by giving preference to controls 1 – 3 listed in the table above, particularly as they are less reliant on worker compliance. The higher level controls focus on designing or engineering out the hazard. *Where a risk remains, a duty holder shall minimise the remaining risk, so far as is reasonably practicable, by implementing administrative controls.*

More than one (1) control option may be required to minimise the risk to its lowest level that is *reasonably practicable.* For example, controlling noise levels may require a sound barrier, hearing protection and administrative controls.

Note relating to Risk Prioritisation: Identifying a risk rating should trigger a prioritisation process that triggers timeframes to remove or control the risk. As a guide, within a reasonable timeframe should be a period of between three (3) months, and not more than six (6) months. As soon as practicable is indicative of treating the risk when there is an assurance that there is no further risk to the health and safety of involved personnel.

5. Monitor and Review

Line Manager(s) or person (s) responsible to conduct risk management activities shall ensure that reviews are completed to assess the effectiveness of risk controls that have been implemented. It is important to:

- check that implemented control methods have either eliminated or at least reduced the risk;
- ensure that implemented control measures have not unintentionally introduced any new hazards;
- ensure that any implemented changes to the work environment, activities, processes, products or services has not altered the risk;
- promote continuous improvement in the management of risk.

The risk control effectiveness should be conducted in-line with the Control Effectiveness guiding questions described in **Figure 2**. Negative answers to these questions indicate weaknesses/gaps in the *controls* that need to be addressed accordingly.

Note relating to maintaining risk registers: Contents of WHS risk register(s) should be reviewed as per *Step 5 - Risk monitoring and review* of ERM-SR-001 Risk Management Procedure; discussed with relevant stakeholders and taken as an opportunity to add new hazard and risks and/or to update the status of *Treatment/Corrective Action Plans.*

Note Workers/ Line Manager(s) or person (s) responsible to conduct risk management activities shall undergo appropriate training and be deemed competent. Specifically, the training and assessment of competency shall be managed in accordance with relevant *Competency Profiles* and associated *Training Needs Analysis*. In addition, personnel training records are kept in line with authorised record keeping requirements.

Further information

ERM-SR-001 Risk Management Procedure

SMS-06-SR-3006 Control Verification Protocols

SMS-06-FM-4107 WHS Risk Assessment Form

SMS-06-OP-3043 Managing Risks Using Safe Work Practices

Document control

Document custodian:	Senior Manager Safety Management System
Document approver:	Director Network Standards, Systems and Quality

Version history

Version	Effective Date	Change notes
2.0	15/06/2020	Major revision. Included principles from *ISO31000* and stronger guiding principles to get a more consistent approach to WHS Risk Management.
2.1	12/11/2021	Note relating to maintaining risk registers in section 5 of this document amended to align with the ERM-SR-001 Risk Management Procedure.
2.2	22/12/2021	• Effectiveness Ratings (Page 5) – wording differences (in line with Control Management Standard); • Design Effectiveness (Page 5) – wording differences (in line with Control Management Standard); • Excerpts from ST Risk Ranking table (Page 6) – wording changes (in line with Risk Ranking Table); • Hierarchy of controls (Page 6) – Isolation has been included as a part of Engineering (in line with Control Management Standard).