

Code of Practice on Workplace Safety and Health (WSH) Risk Management



Preface

As Workplace Safety and Health (WSH) Risk Management ("RM") gains momentum in Singapore, more duty holders are beginning to recognise the usefulness of Risk Assessments ("RA") in maintaining a safe and healthy workplace. Duty holders and workers alike are seeking greater clarity about how RA should be implemented. To provide guidance on bridging the gaps, the WSH Council formed an industry-led RM Work Group with members from major industry sectors to develop this Code of Practice on WSH Risk Management (herein referred to as "Risk Management Code of Practice" or "RMCP").

The RMCP advises duty holders on how to fulfil their obligations under the Workplace Safety and Health Act ("WSH Act") and the WSH (Risk Management) Regulations. It also provides a clearer process for implementing RM and will assist duty holders to identify hazards, evaluate risk and implement risk control measures.

Much consideration has been given to make the RMCP applicable to both large and small companies, and across a broad series of industry sectors, including the remaining workplaces that will come under the WSH Act in September 2011. The risk profiles, needs and RM deployment of these workplaces differ significantly. Large companies tend to have one RM Team to oversee the coherent deployment of RM throughout the company. At the same time, it is not unusual for these companies to have many RA Teams to assess specific risks. Therefore, guidance is included in this RMCP to offer clarity of their roles. Smaller companies, on the other hand, often need specific steps in implementing RM, especially when doing the RA itself. To better help this segment, the RM Work Group decided to provide guidance in bite-sized steps. Roles and responsibilities are also defined in the RMCP to ensure that duties are sufficiently covered with minimum overlap.

Other ideas incorporated in the RMCP include introducing the use of numbers in evaluating risks—this will be useful for prioritising actions; introducing RA review process that can be synchronised with monthly WSH Committee meetings or the regular operations meetings at workplaces; and guidance on how differences in RA ratings should be managed. This RMCP recommends the 5x5 matrix. However, companies may choose other matrices. The Work Group is sensitive to companies that may need to follow corporate guidance.

This RMCP replaces the following guidelines published by Ministry of Manpower previously:

1. Risk Management: Risk Assessment Guidelines
2. A Quick Guide to Risk Assessment

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1. Purpose

The purpose of this Code of Practice (CP) on WSH Risk Management is to establish minimum requirements and duties for implementing workplace RM in Singapore, and to provide guidance on its implementation. This CP applies to all workplaces in Singapore that are governed by the Workplace Safety and Health (WSH) Act.

The CP recognises that different industries have different risk appetites and allows room for implementation flexibility, if there are alternative means of achieving similar or better standard of safety and health. Users of this CP are strongly encouraged to adopt the recommended way as it provides a common platform to facilitate national best practice translation across industries. Completing a RA before work is carried out is a requirement under the WSH (Risk Management) Regulations.

2. Abbreviations

CP	Code of Practice
MOM	Ministry of Manpower
PPE	Personal Protective Equipment
RA	Risk Assessment
RM	Risk Management
RM Regulations	WSH (Risk Management) Regulations 2006
RPN	Risk Prioritisation Number
SWP	Safe Work Procedure
WSH	Workplace Safety and Health
WSH Act	Workplace Safety and Health Act 2006
WSH Council	Workplace Safety and Health Council

3. Definitions

Additional Control	Additional risk control measures are those that are implemented beyond the existing controls to eliminate or to further reduce risk.
Employer	<p>As defined in the WSH Act, an employer is a person who, in the course of the person's trade, business, profession or undertaking, employs any person to do any work under a contract of service.</p> <p>The self-employed person and principal, as defined in the WSH Act shall also fulfil the duties and functions of the employer specified in this CP.</p> <p>Where the WSH Act does not offer sufficient clarity to the definition, reference to "Employer" in this CP means the most senior person responsible for the workplace.</p>
Existing Control	Risk control measures that have been implemented and are still effective in controlling the hazard.
Hazard	Anything, any source or any situation with the potential to cause bodily injury or ill-health.
Risk Appetite	The amount and type of risk that an organisation is prepared to pursue, retain or accept.
Risk Assessment (RA)	The process of evaluating the probability and consequences of injury or illness arising from exposure to an identified hazard, and determining the appropriate measures for risk control.
Risk Assessment (RA) Team(s)	The team(s) responsible for conducting RAs within the scope defined by the RM or RA Team. If an organisation requires only one team, then the functions of the RA and RM team may be combined within one team.
Risk Management (RM)	The identification, assessment and prioritisation of WSH risks followed by the application of control measures to minimise the probability and/or impact of undesirable WSH consequences.
Risk Management (RM) Team(s)	The primary team responsible for the overall RM direction and activities of the workplace. In larger organisations, many functional or area RA Teams may evolve. The responsibility to steer the overall organisation's RM effort will fall on the RM Team. The RM Team can also function as an RA Team.
Risk Matrix	A matrix to classify risk categories for subsequent control with severity and likelihood levels as the two factors determining risk. Common risk matrices include the 3x3 matrix, 5x4 matrix, 5x5 matrix and the 7x7 matrix. Organisations may develop matrices that are suitable and relevant to their operations.
Risk Register	The collection of RAs within the organisation.
Safe Work Procedure (SWP)	Any procedure for carrying out work safely, and includes any procedure which is to be taken to protect the safety and health of persons in the event of an emergency.
Workplace	As defined in the WSH Act, a workplace means any premises where a person is at work or is to work, for the time being works, or customarily works, and includes a factory.
WSH Risk	The likelihood that a hazard will cause a specific bodily injury to any person.

4. Overview

The main components of RM are:

- Preparation
- RA
- Implementation (includes specific communication of the hazards identified and their controls)
- Record-keeping

RA is one component of RM. The three main parts of RA are:

- Hazard Identification
- Risk Evaluation
- Risk Control

5. General Requirements

5.1 General

- 5.1.1** RA shall be carried out and risk control measures shall be implemented *before* any new work commences.

5.2 Employer

The Employer shall:

- 5.2.1** Ensure that RA is conducted on WSH risks associated with any activity in the workplace.
- 5.2.2** Require its workplace to take all reasonably practicable steps to eliminate any foreseeable risk to any person.
- 5.2.3** Require its workplace to take measures to control the risk by means of, and in the following order of consideration where risk elimination is not reasonably practicable:
- Substitution
 - Engineering control
 - Administrative control
 - Provision and use of suitable personal protective equipment (PPE)
- 5.2.4** Support the implementation of risk control measures recommended by the RM or RA Teams.
- 5.2.5** Require the RM Leader to provide regular updates of the RA done and risk control measures implemented to reduce or eliminate identified risks.
- 5.2.6** Require RA updates at each WSH Committee meeting, if such a committee is established, or at the workplace's regular meetings (e.g., new findings, progress of risk control actions).
- 5.2.7** Require the contractor or supplier where work has been assigned or awarded, to conduct RA. The contractor or supplier must take reasonably practicable measures to eliminate, or reduce to as low as reasonably practicable, the risk that may be posed by their work (e.g., machinery, equipment or hazardous substances).
- 5.2.8** Ensure that a Risk Register is available and maintained at the workplace.
- 5.2.9** Ensure that the Risk Register is prepared in accordance with this CP.
- 5.2.10** Ensure that the Risk Register is readily available for review by designated persons at the workplace and by regulatory agencies.
- 5.2.11** Ensure that RA records, including but not limited to RA forms and control measures records, are kept for at least three years from RA approval date.
- 5.2.12** Review and, if necessary, revise the RA at least once in three years from RA approval date, or when there are:
- Accidents, near misses or dangerous occurrences as a result of exposure to a hazard. These may or may not result in injury;
 - Significant change in processes, facilities, work practices or procedures, or change in workplace condition and site layout; or
 - New information on WSH risks is made known.
- 5.2.13** Monitor the effectiveness of the risk control measures.

5.3 Manager

This may be the person who manages a physical area ("Area Manager" e.g., Warehouse Manager), a function ("Functional Manager" e.g., Production Manager) or of an activity (e.g., Machining Manager) within the workplace. In some workplaces, this may be the Employer. The Employer is to determine the appropriate level of engagement for this role.

- 5.3.1** The Manager who oversees the area, function or activity where the WSH risks exist shall:
- Ensure that RA is carried out and risk control measures are implemented *before* any new work is carried out in the Manager's area.
 - Approve the RA conducted for the Manager's area. The Manager should also ensure that the risk level is not rated "High Risk" when approving work to be carried out.
 - Ensure that the risk control measures are implemented without delay.
 - Ensure that, where applicable, all operations have established SWPs.
 - Ensure all persons exposed to the risks are informed of:
 - The nature of risks
 - Any measures or SWP implemented; and
 - The means to minimise or eliminate the risks.
 - Ensure that the effectiveness of the risk control measures is monitored.
 - Revise the RA if the risk control is inadequate and ineffective after the implementation.
 - Maintain RA documentation with measures and SWP implemented.
- 5.3.2** The Manager shall assist the Employer to implement the requirements in Clauses 5.2.8. to 5.2.13.
- 5.3.3** The Manager may authorise other persons to execute the duties mentioned above but remains accountable for them.

5.4 RM/ RA Leaders

- 5.4.1** The RM Leader shall assist the Employer as the focal point for co-ordinating RM within the workplace.
- 5.4.2** The RM or RA Leader shall
- Provide regular updates to the Employer, preferably monthly but no less than once a year, regarding appropriate risk control measures implemented to reduce or eliminate risks identified.
 - Obtain approval from the Employer or the designated Manager for the implementation of risk control measures.
 - Assist the Employer to ensure that the Risk Register is prepared in accordance to this CP.

5.5 Employees

- 5.5.1** Employees are to adhere to the measures stipulated in the RAs.

6. Preparation

6.1 Formation of Risk Management/ Risk Assessment Teams

6.1.1 Appointment of RM Team

6.1.1.1 The Employer shall:

- Appoint a RM Team Leader ("RM Leader")
- Appoint RM Team members ("RM Members")

6.1.1.2 The RM Team shall be responsible for the overall RM direction and RM activities of the Workplace. This RM Team can also function as a RA Team.

6.1.1.3 The RM Team appointed by the Employer shall:

- Have a thorough knowledge of the work to be assessed; and
- Be multi-disciplinary, diverse with representation from major stake-holders of all the Workplace operating functions.

6.1.1.4 Except in a single-person workplace (e.g., self-employed), RA is to be conducted by a multi-disciplinary team who have thorough knowledge of the work to be assessed.

6.1.1.5 The employer shall ensure that the RM Leader is competent for the task. Having attended a RM course conducted by a MOM Approved Training Provider or equivalent is sufficient demonstration of the fact.

6.1.2 RM Team Leader

6.1.2.1 The RM Team Leader should have direct access to the Employer or shall be at least a senior member of the Workplace.

6.1.2.2 The RM Team Leader shall be competent for the task. Having attended a RM course conducted by a MOM Approved Training Provider or equivalent is sufficient demonstration of the fact.

6.1.3 RM Team Members

6.1.3.1 RM team members may be appointed from management staff, process or facility engineers, technical personnel, supervisors, production operators, maintenance staff and WSH personnel if available.

6.1.4 RA Teams

6.1.4.1 Where more teams are required to conduct RA in the Workplace, these shall be called Risk Assessment Teams ("RA Teams"). (See Fig 1.)



Figure 1: RM and RA Teams

- 6.1.4.2** RA Teams are responsible for conducting RAs within the scope defined by the RM Team. If an organisation requires only one team, then the functions of the RM and RA teams may be combined within the RM Team.
- 6.1.4.3** RA Teams should have representatives from both the management and non-management levels.
- 6.1.4.4** The RA team should include personnel who are involved with the work, including contractors and suppliers. If available, it should include persons who are familiar with the design and development of the site, machine or process.
- 6.1.4.5** Where RA experience or expertise is lacking, a WSH Officer, WSH Auditor or Approved Risk Consultant who is trained and has experience in conducting RA should be engaged to assist the RM/ RA leader in the conduct of the RA.
- 6.1.4.6** The RA Team Leader shall be competent for the task before leading the RA team. Having attended a RM course conducted by a MOM Approved Training Provider or equivalent is sufficient demonstration of the fact.

6.2 Extent of RA—Determine What is to be Assessed

6.2.1 Scoping the RA

Scoping is the step of identifying a convenient unit (or "Boundary") for assessing and controlling risks at the Workplace. It may be as simple as dividing a Workplace or project into its distinct parts (e.g., divisions, departments, functional areas or work activities), and then sub-dividing each part into self-contained jobs or areas, each representing the unit for the RA.

- 6.2.1.1** The RM Team (the primary team responsible for the overall RM direction and activities of the company) shall determine the boundaries of the RA (e.g., department, functional area or work activity within the Workplace).
- 6.2.1.2** RAs for each identified department, functional area or work activity should be scoped to provide focus to the Assessment.

6.2.2 Inventory of Work Activity Form

- 6.2.2.1** For the identified departments, functional areas and work activities to be assessed, the "Inventory of Work Activities" form should be used (see Appendix B).
- 6.2.2.2** This CP accepts variation in form format but requires the following information to be included:
 - Department, Activity or Trade Assessed;
 - Location;
 - Process; and
 - Work activity.
- 6.2.2.3** The following information is to be completed in the form:
 - State the department or activity to be assessed in "Department, Activity or Trade Assessed".
 - Complete the Location, Process and Work Activity.
 - List the Work Activity in sequential steps.
- 6.2.2.4** For Trade-based RA:
 - State the trade being assessed in "Department, Activity or Trade Assessed".
 - Where the Location or Process is not applicable, state "N/A" in these columns.
 - Complete Work Activity List.

6.3 Gather Relevant Information

Once the extent of the RA is determined, relevant information should be gathered. These sources of information may include, but not limited to:

- Workplace layout plan
- Process or work flowchart
- List of work activities in the process
- List of chemicals, machinery and/ or tools used
- Records of past incidents and accidents
- Relevant legislation, CPs or specifications
- Observations and interviews
- WSH Inspection records
- Details of existing risk controls
- Health and safety audit reports
- Feedback from employees, clients, suppliers or other stakeholders
- SWPs
- Other information such as safety data sheets (SDS), manufacturer's instruction manual
- Copies of any relevant previous RAs
- Medical condition (e.g., allergy) of workers in the workplace or activity being assessed

7. Risk Assessment

7.1 General Requirement

- 7.1.1** The steps in Hazard Identification, Risk Evaluation and Risk Control specify the methodology and requirements of this CP.
- 7.1.2** When the steps from “Hazard Identification” to “Risk Control” have been recorded in the RA form for a hazard, the same steps from “Hazard Identification” to “Risk Control” are to be repeated till all the “Work Activity” from the “Inventory of Work Activities” has been assessed.
- 7.1.3** As part of a continual review process, this CP recommends that workplace hazards be reviewed monthly till:
- The hazard reaches the green zone (“Low Risk”) or
 - The risks of the hazard are residual in nature (“Residual Risk”; see also additional notes on Residual Risks in Appendix F) or
 - All reasonable practicable measures have been taken to control that hazard.
- 7.1.4** The RM Team is to determine which hazards are to be reviewed monthly.
- 7.1.5** All RA entries must be reviewed and, if necessary, revised at least once within three years.

7.2 Hazard Identification

7.2.1 General

- 7.2.1.1** The RA Team Leader is to determine the most appropriate way(s) of identifying the hazards. These may include brainstorming, systematic process reviews, Process Hazard Analysis and Job Observations and Job Safety Analysis (JSA).
- 7.2.1.2** When identifying hazards, the RA Team is to consider if the hazards could cause harm beyond their immediate area of the work.

7.2.2 Process

- 7.2.2.1** List the “Work Activity” from the “Inventory of Work Activities” form (Appendix B) to the first available cell of “Work Activity” in the “Risk Assessment Form” (Appendix C). This CP accepts variation in form format but requires all the information from the form to be available.
- 7.2.2.2** Identify the hazard and record it in the “Hazard” column.
- 7.2.2.3** Should there be more than one hazard for the work activity, different hazards should be recorded in separate lines.
- 7.2.2.4** The following categories of hazards should be considered:
- Physical (e.g., fire, noise, ergonomics, heat, radiation and manual handling)
 - Mechanical (e.g., moving parts, rotating parts)
 - Electrical (e.g., voltage, current, static charge, magnetic fields)
 - Chemical (e.g., flammables, toxics, corrosives, reactive materials)
 - Biological (e.g., blood-borne pathogens, virus)
 - Others (e.g., hazards peculiar to the industry)

7.3 Risk Evaluation

7.3.1 Risk Matrices

7.3.1.1 This CP recognises the various Risk Evaluation methods and matrices practiced and preferred by workplaces. While this CP does not restrict workplaces with its choice of matrices, the numeric 5x5 Risk Matrix is recommended. Common matrices include, and not limited to, the following as given in Table 1, 2 and 3:

Likelihood \ Severity	Remote	Occasional	Frequent
Major	Medium Risk	High Risk	High Risk
Moderate	Low Risk	Medium Risk	High Risk
Minor	Low Risk	Low Risk	Medium Risk

Table 1: Example of a common 3x3 Risk Matrix with descriptive ratings

Likelihood \ Severity	Rare (1)	Remote (2)	Occasional (3)	Frequent (4)	Almost Certain (5)
Catastrophic (A)	Medium	Medium	High	High	High
Major (B)	Medium	Medium	Medium	High	High
Moderate (C)	Low	Medium	Medium	Medium	High
Minor (D)	Low	Medium	Medium	Medium	Medium
Negligible (E)	Low	Low	Low	Medium	Medium

Table 2: Example of a common 5x5 Risk Matrix with a mix of numeric and descriptive ratings

7.3.1.2 The Matrix recommended by this CP is as follows:

Likelihood \ Severity	Rare (1)	Remote (2)	Occasional (3)	Frequent (4)	Almost Certain (5)
Catastrophic (5)	5	10	15	20	25
Major (4)	4	8	12	16	20
Moderate (3)	3	6	9	12	15
Minor (2)	2	4	6	8	10
Negligible (1)	1	2	3	4	5

Table 3: Recommended 5x5 Risk Matrix with numeric ratings

7.3.1.3 When using Risk Matrices other than the numeric 5x5 matrix recommended by the CP, all references to the scales (i.e., 1, 2, 3, 4 or 5) should be read in context of the Risk Matrix selected (e.g., "Minor", "Moderate" or "Major" in lieu of "1", "2", "3", "4" or "5").

7.3.1.4 Unless otherwise specified in this CP, the methodology specified in this CP is to be followed.

7.3.2 General

7.3.2.1 When Hazard Identification is complete, proceed with Risk Evaluation procedure.

7.3.3 Existing Control

7.3.3.1 Identify the existing risk controls and state it in the "Existing risk controls" column.

7.3.3.2 Where there is more than one existing risk control for the hazard being evaluated, they should be listed in the same line as the hazard.

7.3.4 Assessment of Severity

7.3.4.1 With the existing risk controls and residual risks in consideration, each team member is to rate the most likely severity outcome of the possible injury or ill-health identified earlier, that is, Level 1, 2, 3, 4 or 5.

7.3.4.2 Enter the number average of the RA Team's severity score in column "S" (Severity). Decimal numbers are acceptable.

7.3.4.3 When using the 5x5 matrix, the following guidance given in Table 4 should be used in selecting the level of severity.

Level	Severity	Description
5	Catastrophic	Fatality, fatal diseases or multiple major injuries.
4	Major	Serious injuries or life-threatening occupational disease (includes amputations, major fractures, multiple injuries, occupational cancer, acute poisoning).
3	Moderate	Injury requiring medical treatment or ill-health leading to disability (includes lacerations, burns, sprains, minor fractures, dermatitis, deafness, work-related upper limb disorders).
2	Minor	Injury or ill-health requiring first-aid only (includes minor cuts and bruises, irritation, ill-health with temporary discomfort).
1	Negligible	Not likely to cause injury or ill-health

Table 4: [Guidance for severity rating](#)

7.3.4.4 Should the *difference* in rating among team members be 2 or greater, the following should be done:

- The Team Leader is to facilitate a discussion to understand the reasons behind the variance.
- The team is then allowed to reconsider their rating.
- Should the difference in rating among team members continue to be 2 or greater, the Team Leader may then choose to allow this difference in rating or to take other courses of action to gain a better understanding of the rating.

7.3.5 Assessment of Likelihood

7.3.5.1 With the existing risk controls and residual risks in consideration, each team member is to rate the likelihood that the hazard may cause the injury/ill-health, that is, Level 1, 2, 3, 4 or 5.

7.3.5.2 When considering likelihood, the RM or RA Team is to consider the existing medical condition of the affected persons that may affect the likelihood rating.

7.3.5.3 Enter the number average of the RA Team's likelihood score in column "L" (Likelihood). Decimal numbers are acceptable.

7.3.5.4 When using the 5x5 matrix, the following guidance given in Table 5 should be used in selecting the level of Likelihood.

Level	Likelihood	Description
1	Rare	Not expected to occur but still possible.
2	Remote	Not likely to occur under normal circumstances.
3	Occasional	Possible or known to occur.
4	Frequent	Common occurrence.
5	Almost Certain	Continual or repeating experience.

Table 5: [Guidance for likelihood rating](#)

- 7.3.5.5** Should the *difference* in rating among team members be 2 or greater, the following should be done:
- The Team Leader is to facilitate a discussion to understand the reasons behind the variance.
 - The team is then allowed to reconsider their rating.
 - Should the difference in rating among team members continue to be 2 or greater, the Team Leader may then choose to allow this difference in rating or to take other courses of action to gain a better understanding of the rating.

7.3.6 Risk Prioritisation Number

- 7.3.6.1** Obtain the Risk Prioritisation Number (RPN) by multiplying the “S” and “L” columns and entering the score in column “RPN” (i.e., $RPN = S \times L$). Decimal numbers are acceptable.

7.3.7 Classification of Risk—Risk Matrix

- 7.3.7.1** Compare the RPN against this Risk Matrix given in Table 6.

- 7.3.7.2** Additional Risk Controls must be implemented such that the hazards are no longer in the red zone (“High Risk”) before work commences.

Additional Risk Controls should be implemented till:

- Risk Controls for the hazard in the yellow zone (“Medium Risk”) are already As Low As Reasonably Practicable (ALARP); or
- The hazard is in the green zone (“Low Risk”).

Likelihood \ Severity	Rare (1)	Remote (2)	Occasional (3)	Frequent (4)	Almost Certain (5)
Catastrophic (5)	5	10	15	20	25
Major (4)	4	8	12	16	20
Moderate (3)	3	6	9	12	15
Minor (2)	2	4	6	8	10
Negligible (1)	1	2	3	4	5

Table 6: 5x5 Risk matrix with numeric ratings

- 7.3.7.3** The RM Team is to determine for its organisation, with the concurrence of the employer, which areas within the Matrix are to be classified Low, Medium and High risks. This CP recognises that levels of risk as well as organisation risk appetites vary across workplaces.

7.3.8 5x5 Risk Matrix

The Risk Matrix provides a useful framework to classify risks identified. When using this CP’s 5x5 matrix example, the following format is to be followed:

- 7.3.8.1** Severity shall be listed in descending order of severity from the top to the bottom in the left column of the table.

- 7.3.8.2** Severity should be scored as shown in Table 7:

Description	Score
Catastrophic	5
Major	4
Moderate	3
Minor	2
Negligible	1

Table 7: Severity scoring

7.3.8.3 Likelihood shall be listed in ascending order of likelihood from left to right of the top row of the table.

7.3.8.4 Likelihood should be scored as shown in Table 8:

Description	Score
Rare	1
Remote	2
Occasional	3
Frequent	4
Almost Certain	5

Table 8: Likelihood scoring

7.3.8.5 The RM Team is to determine for its organisation with the concurrence of the employer, which areas within the Matrix are to be classified Low, Medium and High risks. This may be done based on, and not limited to, industry practice, the policies of the workplace and organisation's risk appetite.

7.3.8.6 All three categories, Low, Medium and High risks, are to be listed in the matrix.

7.3.9 Action for Risk Levels

The following actions are to be implemented based on the current Risk Level, as shown in Table 9.

Risk level	Risk Acceptability	Recommended Actions
Low Risk	Acceptable	<ul style="list-style-type: none">• No additional risk control measures may be needed.• Frequent review and monitoring of hazards are required to ensure that the risk level assigned is accurate and does not increase over time.
Medium Risk	Tolerable	<ul style="list-style-type: none">• A careful evaluation of the hazards should be carried out to ensure that the risk level is reduced to as low as reasonably practicable (ALARP) within a defined time period.• Interim risk control measures, such as administrative controls or PPE, may be implemented while longer term measures are being established.• Management attention is required.
High Risk	Not acceptable	<ul style="list-style-type: none">• High Risk level must be reduced to at least Medium Risk before work commences.• There should not be any interim risk control measures. Risk control measures should not be overly dependent on PPE or appliances.• If practicable, the hazard should be eliminated before work commences.• Management review is required before work commences.

Table 9: Recommended action for risk levels

7.4 Risk Control

7.4.1 Additional Controls

- 7.4.1.1** Compare the existing controls against the Hierarchy of Control (see Appendix D).
- 7.4.1.2** When considering additional measures to reduce risk, the more effective measures in the Hierarchy of Control should be considered first.

7.4.2 Re-evaluation with Additional Controls

- 7.4.2.1** When Additional Control(s) have been decided, re-rate the Severity, Likelihood and RPN scores and record them in the "S", "L" and "RPN" columns in the "Risk Control" section.
- 7.4.2.2** The new risk control RPN shall not be HIGHER than the Risk Evaluation RPN.

7.4.3 Guidance Notes

- 7.4.3.1** Preferably, the revised RPN should be within the Low Risk (Green) zone.
- 7.4.3.2** However, an improvement in RPN is acceptable provided it is not within the High Risk (Red) zone.

7.4.4 Implementation Person and Date

- 7.4.4.1** A specific person should be identified to lead the implementation of the Additional Controls. The person's name is to be recorded in the "Implementation Person" column.
- 7.4.4.2** The due-date for implementation is to be recorded in the "due-date" column.
- 7.4.4.3** The Implementation Person is to provide progress updates to the RA Team on a periodic basis as determined by the RA Team Leader.

8. Implementation

8.1 RA Approval

- 8.1.1** Completed RA forms must be approved by the Manager of the area, function or activity where the risk is being assessed.

8.2 Implementation Actions

- 8.2.1** As far as is practicable, the Manager is to implement the recommended risk control measures as soon as possible.
- 8.2.2** The Manager shall ensure that an action plan is prepared to implement the measures. The plan should include a time line of implementation and responsible persons implementing the safety and health control measures.
- 8.2.3** The Manager shall ensure that the plan is monitored regularly until all the measures are implemented.
- 8.2.4** The Manager shall ensure that all persons exposed to the risks are informed of:
- The nature of risks; and
 - Any measures or SWP implemented.
- 8.2.5** The Manager shall ensure that regular inspections and process audits are carried out to ensure that risk control measures have been implemented and are functioning effectively.
- 8.2.6** After the implementation of additional controls, the “Existing Controls” and “Additional Controls” columns of the RA form are to be updated (refer to Appendix F “Additional Notes - Updating the RA Form after Implementation”).

8.3 Communication

- 8.3.1** While various forms and levels of communication are to take place throughout the RM process, this CP requires the specific communication of the hazards identified and their controls to the persons performing the activity.
- 8.3.2** The Manager who oversees the area, function or activity where the WSH risks exist shall ensure that all persons exposed to the risks are informed of:
- The nature of risks;
 - Any measures or SWP implemented; and
 - The means to minimise or eliminate the risks.

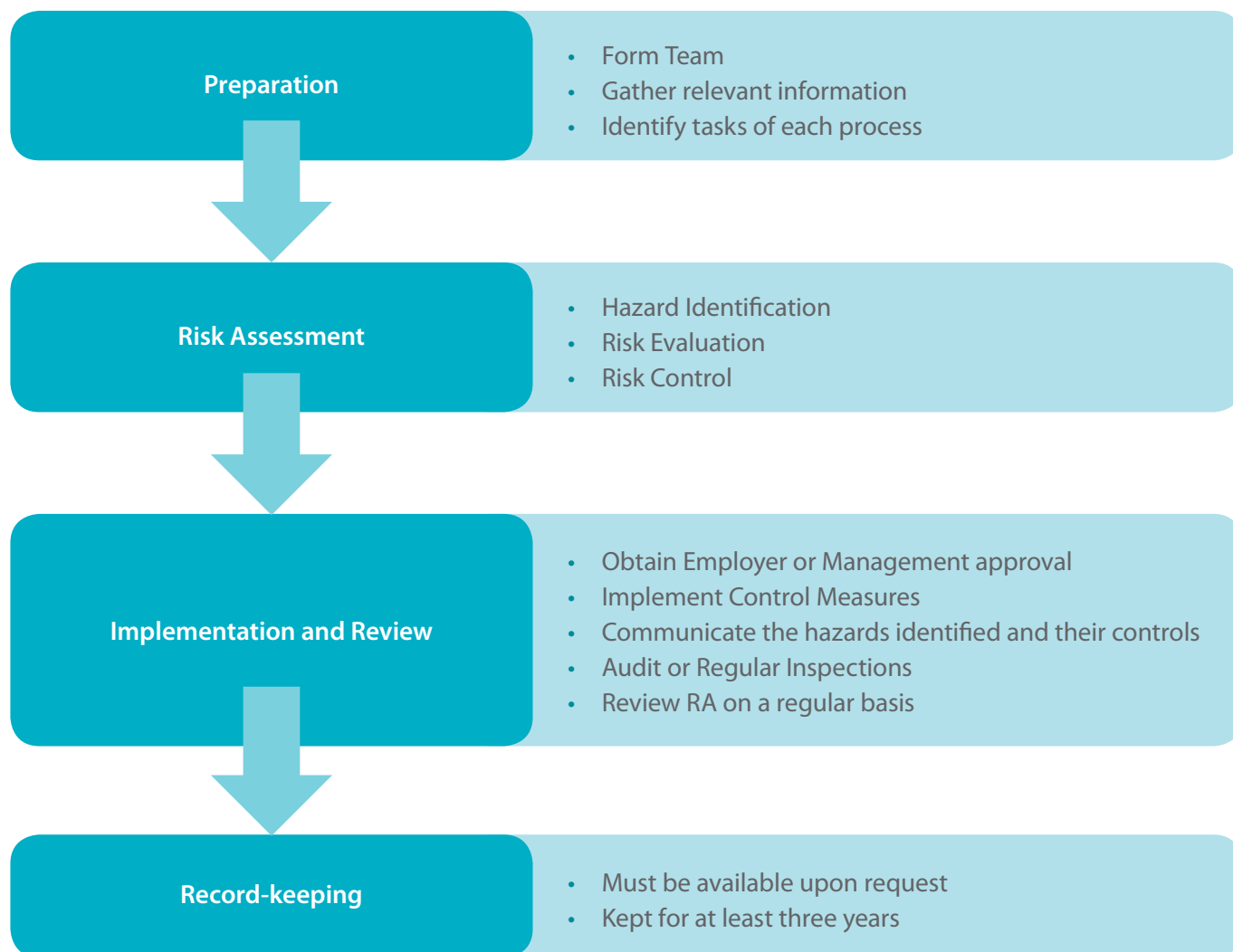
8.4 Records

- 8.4.1** The Manager shall assist the employer to ensure that RA records, including but not limited to RA forms and control measure records, are kept for at least three years.
- 8.4.2** The Manager shall assist the employer to ensure that the Risk Register is readily available for review by designated persons at the workplace and by regulatory agencies.

9. List of References

1. AS/NZS 4360:2004, Risk Management (Standards Australia)
2. BS 31100:2008, Risk Management – Code of Practice (BSI)
3. Identifying Hazards in the Workplace – A Guide for Hazards in the Workplace (Australia Comcare)
4. ISO 31000: 2009 Risk Management – Principles and guidelines on Implementation
5. ISO/IEC Guide 73:2009, Risk Management Vocabulary
6. Workplace Safety and Health Act
7. Workplace Safety and Health (Risk Management) Regulations
8. WSH Risk Management: Risk Assessment Guidelines (MOM)

Appendix A: Risk Management Process



Appendix B: Inventory of Work Activities Form

Inventory of Work Activities

Department, Activity or Trade Assessed				Date
Ref	Location	Process	Work Activity	Remarks
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Note:

1. This form is to be completed before filling in the Risk Assessment Form.
2. The contents of the Work Activity column in the Inventory of Work Activities Form is to be copied over to the Work Activity column in the Risk Assessment Form.

Page ____ of ____ page(s)

Appendix C: Risk Assessment Form

Risk Assessment Form

Department:		RA Leader:		Approved by: Signature:		Reference Number	
Process:		RA Member 1:		Signature:			
Process/ Activity Location:		RA Member 2:					
Original Assessment Date:		RA Member 3:		Name:			
Last review Date:		RA Member 4:		Designation:			
Next review Date:		RA Member 5:		Date			
Hazard Identification				Risk Control			
Ref	Work Activity	Hazard	Possible Injury/ Ill-health	Risk Evaluation			Remarks
				Existing Risk Controls	S	L	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Notes:

Page ____ of ____ page(s)

Appendix D: Hierarchy of Control

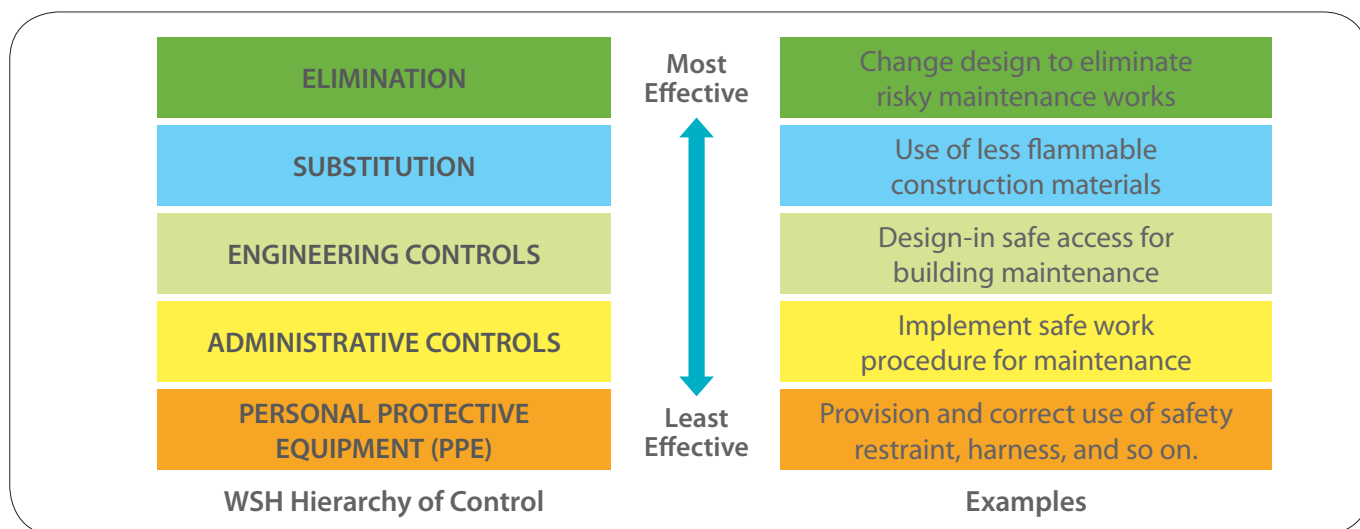


Figure 2: Hierarchy of control

The control of hazards and reduction of risks can be accomplished by following the WSH Hierarchy of Control (see Figure 1). These control measures are not usually mutually exclusive. Generally, it may be more effective to use multiple control measures, for example, engineering controls work better with administrative controls like training and SWPs.

Elimination

Elimination of risk refers to the total removal of the worker's exposure to the hazards, effectively making all the identified possible accidents, incidents and ill health impossible. This should be attempted first as recommended in the hierarchy, and is a permanent solution. Once the risk is eliminated, the item does not appear in subsequent RA forms. For example, using robots to replace humans to eliminate the danger of working in confined space.

Substitution

This involves substituting a process or a product with a less hazardous process or product to mitigate the risk, for example, using water-based paint instead of solvent-based paint.

Engineering Controls

Engineering controls are physical means that serve the workforce by reducing the likelihood of occurrence or severity of consequence of the mishap. These include structural changes to the work environment or work processes, erecting a barrier to interrupt the accident transmission path between the worker and the hazard (for example, machine guards, confined space ventilation).

Administrative Controls

These eliminate or reduce exposure to a hazard by adherence to procedures or instructions. Documentation should emphasise all the steps to be taken and the controls to be used in carrying out the activity safely. For example, Permit-to-work systems, scheduling of incompatible works, SWPs (see also Appendix F for additional notes on SWP).

Personal Protective Equipment

This should be used only as a last resort, after all other control measures have been considered, or as a short term contingency during emergency/ maintenance/ repair, or as an additional protective measure against residual risks. The success of this control depends critically on the protective equipment being chosen correctly, fitted correctly, worn at all times and maintained properly.

Appendix E: Risk Register and Cover Sheet

This Appendix provides an example of:

1. The compilation of a Risk Register
2. Risk Register Cover Sheet

1. The Compilation of a Risk Register

A compilation of RAs is called a Risk Register. A risk register form records the main elements individual RA. A sample risk register is as follows:

[illegible]

2. Example of a Risk Register Cover Sheet

While not mandatory, a Risk Register Cover Sheet provides a convenient way to list all the RAs in the register.

Risk Register Cover Sheet

Workplace Name

RA Ref No.	Department	Process/ Activity Location	RA Approval Date	Next Review Date	RA Leader & Designation	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

Notes:

Page ____ of ____ page(s)

Appendix F: Additional Notes

Safe Work Procedures

Arising from the RA, SWPs should be established, communicated and implemented for work which may pose safety and health risks. The SWPs should include the safety precautions to be taken in the course of work and during an emergency, as well as the provision of PPE. They should then be monitored regularly and reviewed periodically.

Residual Risks

Residual risks are the remaining risks after implementation of risk controls. The RA team should ensure that residual risks are acceptable and manageable; and highlight the residual risks of each of the controls.

For example, if the risk control involves the use of safety harnesses and lanyards (a type of PPE), one of the residual risks is that the workers may not anchor the lanyards to protect themselves. In this case, the RA Team may highlight pre-job safety briefing (administrative control) as a further measure to ensure that residual risks are further minimised.

Once all the risk controls are selected and their residual risks highlighted, the RA Team needs to identify the action officers and follow-up dates. In this way, the specific action officers to implement the controls can be clearly identified, and the follow-up dates will help to ensure timeliness in implementation.

Updating the RA Form after Implementation

After implementation, Additional Controls would have become Existing Controls. To update the RA form, the RA Team is to reconcile the controls by updating the Existing Controls column and deleting the controls under Additional Controls.

The following are to be considered when reconciling Existing Controls with Additional Controls:

- a. ADD Additional Control measures in the Existing Control column if they are new controls. For e.g.

i. Existing Control	Noise Enclosure
ii. Additional Control	Ear plugs as an ADDITIONAL layer of protection
iii. Record reconciliation under the Existing Control column	a. Keep "Noise Enclosure" b. Add "Ear Plugs" under Existing Controls
iv. Record reconciliation under the Additional Control column	a. Delete "Ear Plug"

OR

- b. REPLACE Existing Control measures with new measures as appropriate. For e.g.

i. Existing Control	Ear-plugs
ii. Additional Control	Ear-muff
iii. Since the RA Team had decided that the use of ear-muffs is adequate and will replace the use of ear-plugs	
1. Record reconciliation under the Existing Controls column	a. Add "Ear-muffs" b. Delete "Ear-plugs"
2. Record reconciliation under the Additional Control column	a. Delete "Ear-muffs"

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