

Occupational Risk Management System

The Procedure for Assessing Occupational Hazard Risk Using the Risk Matrix Approach

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A risk assessment is the analytical process of estimating the risk level of an occupational hazard and deciding whether the risk is acceptable or requires specific control measures. Using a risk matrix is a cost-effective method for effectively managing occupational hazards in the workplace.

Primary Reasons for Conducting a Risk Assessment Using a Matrix for Analyzing a Hazard Are:

- to prioritize hazard control activities according to level of risk
- to use the risk assessment as a guide on how the risk needs to be controlled
- to justify the control activities and associated costs based on the level of required risk reduction

Important Concepts to Know:

- a hazard is something with the potential to cause harm and includes any condition, practice, act, behaviour or thing that can cause injury, illness, or death
- risk is the likelihood that illness, injury, death or property damage might result due to the hazard
- each hazard has a likelihood and frequency of exposure or accident and an associated injury severity level in the event of an incident

First Stage of the Risk Assessment:

Once a hazard has been identified, conducting a comprehensive risk assessment begins by reviewing available information that is relevant to the particular hazard being investigated. This includes:

- analysis of departmental occupational accidents, illnesses, incidents and the severity of injuries; and lost work time data due to injuries
- OHS information provided by a supplier of any equipment being used
- safety data sheets (SDS) for any hazardous substance
- results of any biological monitoring or atmospheric monitoring
- legislative guidelines, industry safety standards and code of practice

In Addition, the Following Factors Should be Considered that Could Contribute to the Hazard Risk:

- the work premises and working environment (including the layout and condition)
- the capability, skill, experience and age of employee ordinarily undertaking the work
- the systems of work being used
- the range of reasonably foreseeable and unforeseeable conditions

Preparing for a Risk Matrix Analysis of a Hazard:

Before performing a risk matrix hazard analysis, a decision has to be made to establish exactly what level of hazard risk is acceptable or tolerable. This decision is based on legislative requirements, OHS standards, codes and regulations, as well as management best practices. To separate those hazard risk levels that are unacceptable from those that are tolerable, hazard risks should be evaluated in a careful and consistent manner. A risk matrix analysis is a flexible process that can be modified to suit a particular hazard, work environment or work task while taking into consideration the type of hazard being evaluated.

The risk matrix hazard analysis is used to evaluate the relationship between the likelihood and frequency of exposure to the hazard or work practice, and the severity of the consequence(s) that could result from exposure to the hazard or dangerous work practice, or in the event of an accident. The risk level that is subsequently calculated is referred to as a “risk priority ranking” and is an estimate of the risk of how dangerous the hazard or work practice is. The priority ranking allows managers to prioritize the implementation of hazard control measures that ensure risks with high to moderate potential of danger are eliminated or effectively controlled first.

The Risk Matrix Should:

- have clear guidance on applicability
- have consistent likelihood ranges that cover the full spectrum of potential scenarios
- have detailed descriptions of the consequences of concern for each consequence range
- have clearly defined tolerable and intolerable risk levels
- show how scenarios that are at an intolerable risk level can be mitigated to a tolerable risk level on the matrix
- provide clear guidance on what action is necessary to mitigate intolerable risk levels

Procedure for a Developing a Basic Risk Matrix Hazard Analysis:

The likelihood and severity information are recorded in a risk matrix table using either a numerical or alphabetical code.

Step I:

Develop and tabulate in chronological order definitions for *severity* of the exposure consequences (from most to least significant) relevant to the hazard being evaluated. It should be noted that there might be more than one consequence from a single event or exposure.

Example:

Hazard Severity Table

Severity	Description
High	Permanent total disability; chronic illness; and even death.
Medium	Temporary compensable disability or illness.
Low	Minor injury resulting in lost workday; may require first aid.

Step II:

Develop and tabulate in chronological order definitions for *likelihood or frequency* of hazard exposure. When assessing likelihood, it is important to take into consideration the hazard controls already in place. Likelihood describes how possible it is that the described adverse consequence will occur.

Likelihood Can Be Scored by One of the Following Criteria Depending on the Type of Hazard Being Evaluated:

- frequency – how many times (hourly, daily, weekly, monthly, etc) will exposure to the hazard or work practice occur?
- duration – how much is the amount of time of hazard exposure?
- probability – what is the chance the consequence will occur in a given reference period?

Example:

Hazard Exposure Frequency Table

Hazard Activity Frequency	Description
Frequent	Steps/tasks occur very often (several hours per day). Likely to occur frequently.
Occasional	Steps/tasks occur often. Will occur once or several times pre day.
Non-Routine	Steps/tasks occur fairly often, several times a week or month. Likely to occur sometimes during the job.
Seldom	Steps/tasks occur sometimes or sporadically. Unlikely to occur, but possible.
Rarely	Steps/tasks occur very rarely and can be assumed will not occur.

Step III:

Create a two-dimensional four by four matrix, with hazard exposure severity on the X-axis and the hazard exposure frequency on the Y-axis. By examining and matching the exposure frequency and severity information from the tables above, place the appropriate risk rankings into the risk matrix table.

Example:

Risk Matrix Table

Exposure Frequency	Hazard Severity			
	High	Medium	Low	Minor
Frequent	RK1	RK1	RK1	RK3
Occasional	RK1	RK1	RK2	RK3
Non-Routine	RK1	RK1	RK3	RK3
Seldom	RK2	RK2	RK3	RK3
Rarely	RK2	RK3	RK3	RK3

Step IV:

Using the information obtained from the Severity and Frequency tables on the hazard being evaluated, determine the risk priority rank from the Hazard Risk Priority Rank table which provides the control requirement information.

For example, an employee who handles a sharps product “occasionally” that contains a “high severity” hazardous drug will have a Risk Rank of **RK1** that requires the appropriate risk control actions as described in the Hazard Risk Priority Ranking table.

Example:

Hazard Risk Priority Rank Table:

Risk Priority Rank	Risk Descriptor
RK #1 (unacceptable)	High risk — Requires immediate management attention. Effective hazard risk controls must exist or be implemented prior to carrying out the work activity; Hazard elimination preferred; Hazard substitution and / or engineering controls required; Written Safe Work Practices required; Qualified competent worker required; Regular training required with record of attendance; Personal protection equipment may be required; Emergency response plan required; May require Job Safety Analysis; Routine assessment through workplace safety inspections of hazard control activities required.
RK #2 (unacceptable)	Moderate risk — Requires management attention within a reasonable timeframe to prevent or reduce the likelihood and severity of an accident, injury or illness. Hazard control action plan required; Written Safe Work Practices required. Suitable education and training required with record of attendance. Routine assessment through workplace safety inspections of hazard control activities required.
RK #3 (acceptable with administrative controls)	Low risk — Managed by routine administrative safety procedures and regular education / training. Requires supervisor and employee continuous attention to reduce the likelihood and severity of an incident.