

1 Introduction

Specific objectives of this Risk Management Plan include:

- Ensure critical risks impacting scope, schedule, budget, business performance, and/or change management are proactively identified, communicated, mitigated, and escalated in a timely manner.
- Facilitate attention to key risks impacting the project and individual teams.
- Produce meaningful information that allows project management to focus efforts on the “right” (e.g., high likelihood and high impact) risks with an effort and reviewing it with the team and stakeholders.
- Work and communicate progress on most severe risks first.

PURPOSE

This TU Risk Management Plan provides the project a consistent method to manage risks to ensure success. Risk management is the processes for identification, assessment, mitigation, tracking, control and management of the project's risks. It drives decisions that affect the development of the business capability and the management of TU projects. Risk Management Plan include:

- Ensure critical risks impacting scope, schedule, budget, business performance, and/or change management are proactively identified, communicated, mitigated, and escalated in a timely manner.
- Facilitate attention to key risks impacting the project and individual teams.
- Produce meaningful information that allows project management to focus efforts on the “right” (e.g., high likelihood and high impact) risks with an effective coordination of effort.
- Ensure appropriate stakeholders are informed and, if applicable, participate in the mitigation.
- Record an audit trail of discussions and mitigation of project risks.

SCOPE & CONTEXT

The TU Risk Management Plan consists of the process and timing for identifying and managing risks, mitigation actions required, and organizational responsibility for monitoring and managing the risks throughout the entire lifecycle.

GUIDING PRINCIPLES

- The risk manager is responsible for making an overall risk assessment and reviewing it with the team and ownership
- Work and communicate progress on most severe risks first.
- Set realistic due dates and then work to meet the dates.
- Mitigate risks at the appropriate level (i.e., project, team, sub-team).
- Keep stakeholders informed on current risk status.
- Document the planned risk mitigation history and actual mitigation of a risk. This documentation serves as a key input to root cause analysis, key learning, metrics, and risk analysis.
- For high impact, impending risks, a rapid decision turnaround may be required, as determined by the Risk/Project Manager. In such cases, available applicable team members will make the decision.

2 Likelihood

Likelihood is often also called Frequency or Probability.

Likelihood ratings will vary significantly by organisation. A larger metropolitan passenger rail operator has a much greater exposure to specific hazards and consequences due to the high frequency and high capacity nature of its operations (i.e. carrying hundreds of passengers on high-speed train services on dense lines) when compared with a smaller, less complex rail operator. A smaller, less complex rail operator generally carries less passengers, potentially on a single train trip on a given day at a lower speed and on a lower frequency line. It is therefore extremely important to have a likelihood range that is appropriate, and suitable for, the scope and nature of the operations performed.

There is no requirement to break likelihood into a set number of levels, though traditionally between 4 to 6 is considered reasonable and appropriate. The number of levels of likelihood must equal the number of levels of consequence.

In order to develop the descriptors that you will measure likelihood against, you should try to prepare a list that describes the likelihood/frequency of risks occurring in your operations and other like operations on the railroad and possibly overseas. The list needs to be appropriate to your operations. Things to consider are:

- > *How long has the business been established?*
- > *How often have different types of incidents occurred in the past?*
- > *Other like or similar operators: How often have you heard of incidents that occurred that could also happen in your operation?*
- > *The frequency of your operations – Daily, Weekly, Monthly, Quarterly, Yearly?*
- > *What does your workforce look like?*
- > *How often can a risk occur before it affects the workers capacity to do a task?*

Some example likelihood ratings and descriptors for smaller, less complex worker tasks are included here as a starting point for discussion and/or consideration. There is no intent for adoption of any, or all, of these examples - they are provided for information only.

Please note that no two examples are the same:

Example Likelihood Descriptors	Rating No
More than ten times a year	5
Between one and nine times a year	4
Once every two to five years	3
Once every five to ten years	2
Less than once every ten years	1

Example Likelihood Descriptors	Rating No
Expected to occur (multiple times a year)	5
Will probably occur (once a year)	4
May occur (once a year to five years)	3
Could occur (once every five - ten years)	2
Occurs only in exceptional circumstances (once in eleven or more years)	1

Example Likelihood Descriptors		Rating No
Almost Certain	Expected to occur most times operations occur	5
Very Likely	This has been known to happen in the past	4
Likely	It could happen. It is easy to imagine it happening. Hasn't happened to us but to other similar operators in Australia or overseas.	3
Unlikely	To occur it would take the failure of a number of controls	2
Rare	There is little or no chance of this occurring, and a significant number of factors would have to fail simultaneously	1

Example Likelihood Descriptors		Rating No
Almost Certain	Often Occurs / once a week	5
Very Likely	Could easily happen / once a month	4
Likely	Could happen or known to happen / once a year	3
Unlikely	Hasn't happened yet but could / once every 10 years	2
Very Unlikely	Conceivable but only on extreme circumstances / once in 100 years	1

Figure 1 – Example Likelihood Descriptors and Ratings

Workers that elect to mimic the likelihood descriptors in use by other organisations should ensure that they are appropriate to their own operations first and make adjustments accordingly.

3 Consequence Rating

Consequence is also often called Severity or Impact.

The severity or impact of consequences can differ significantly by organisation. For example, even though both a large, state-wide passenger operator and a smaller, less complex operator may experience the same consequence of multiple injuries resulting from a rail workers incident, the impact of this on the operators will vary significantly, including the associated financial loss.

An example could include a death of a person. This may result in the permanent closure of a smaller less-complex operator which would thus be 'Catastrophic'. A single fatality for a Large rail contractor would be considered a 'Serious' event which would not result in the operator ceasing operations.

Financial loss of \$250,000 may not be significant to a large, Large contractor but may lead to insolvency of a smaller contractor. Therefore, if one the consequence descriptors includes financial loss, it may be 'Major' or 'Catastrophic' for a small operator but only 'Medium', 'Moderate' or 'Serious' for a large operator.

All of these aspects need to be taken into consideration when developing the consequence descriptors, while retaining a focus on safety as the priority.

It is often recommended that consequence descriptors include multiple categories and therefore ways the operator may be adversely impacted, by the same hazard or risk. This could include a financial cost amount as well as a safety outcome (e.g. injuries and fatalities). Some larger, more complex operators may also include environmental outcomes, reputation outcomes (e.g. local or national media coverage), operational (e.g. delays or interruptions to services and operations) and legal / regulatory outcomes (e.g. penalties, accreditation impact) in their consequence descriptors, depending on their risk maturity.

There is no requirement to break consequence into a set number of levels, though traditionally between 4 to 6 is considered reasonable and appropriate. The number of levels of consequence must equal the number of levels of likelihood.

Think about all of the factors that would lead to the development of a list that describes the consequence/severity of risks occurring in your operations. The list needs to be appropriate to your operations. Remembering that this risk matrix is required to manage safety, things to consider are:

- > *What would be the impacts on the operations if there was:*
 - *A death or multiple deaths?*
 - *A single or multiple severe injury(ies)?*
 - *A significant rail related incident?*
 - *Is rail infrastructure still safe?*
 - *workers not working safely?*
 - *How long could we remain non-operational?*
 - *Workers Compensation Claims?*
 - *Significant damage to an asset?*
 - *Loss of an asset?*
 - *Are there other assets that can be used?*
 - *What response times for recovery would be needed?*

- > *What about reputational loss?*
 - *What would be the impacts from media fall out?*
 - *How would local media attention compare to national attention?*
 - *Would people stop coming?*
 - *How will you manage passenger safety?*
 - *What does that mean to the business?*

- > *What can the operations bear?*
 - *Financially? Ethically?*
 - *How much can the rail operator pay out if legal action is taken as a result?*
 - *What would be the financial limit before insolvency of the operator?*
 - *What is a catastrophic financial loss?*
 - *What impact has the loss of a life on operations and the operator?*

- > *What is the corporate insurance excess?*
 - *What would be the impact on premiums if a major incident occurred?*
 - *What are its limits of liability?*
 - *What can the business afford to pay over and above that covered by insurance?*
 - *Would claims be avoided due to the large excess?*

- > *Would the operations be able to continue? If not, what is the impact of down-time?*

Some example Consequence Ratings and Descriptors are included here as a starting point for discussion and/or consideration:

Consequences		
1	Insignificant	No Injuries / Minimal Financial Loss
2	Minor	First Aid Treatment / Medium Financial Loss
3	Moderate	Medical Treatment / Moderate Financial Loss
4	Major	Hospitalisation / Large Financial Loss
5	Catastrophic	Death / Massive Financial Loss

Consequences		
1	Insignificant	No Injuries / Financial Loss - Less than \$5,000
2	Minor	First Aid Treatment / Financial Loss - \$5,001 - \$9,999
3	Moderate	Medical Treatment / Financial Loss - \$10,000 - \$19,000
4	Major	Hospitalisation / Financial Loss - \$20,000 - \$49,999
5	Catastrophic	Death / Financial Loss - \$50,000 and over

Consequences		
1	Minor	Injury requiring First Aid treatment only. No lost time.
2	Medium	Injury requiring attention from medically qualified person. No lost time.
3	Serious	Life threatening injury requiring hospitalisation or medivac.
4	Major	Serious permanent disabling injury.
5	Catastrophic	A single fatality, or multiple fatalities.

Consequence	1	2	3	4	5
People / Safety	Minor injury or First Aid Treatment	Injury causing medical treatment	Serious injury causing hospitalisation	Life threatening injury or multiple severe injuries causing hospitalisation	Single or multiple deaths or multiple life-threatening injuries or severe permanent disabilities
Reputation	Unsubstantiated, low impact, low profile or 'no news' item	Substantiated, low impact, 'low news' profile	Substantiated public embarrassment, moderate impact, 'moderate' news profile	Substantiated, public embarrassment, high impact news profile, third party actions	Substantiated, public embarrassment, very high multiple impacts, widespread multiple third-party actions
Operation	Little Impact	Inconvenient delays	Significant delays to major operations	Non achievement of major operations	Non achievement of key objectives
Financial	< \$20,000	\$20,000 - \$150,000	\$150,000 - \$500,000	\$500,000 - \$2,000,000	>\$2,000,000

Figure 2 – Example Consequence Descriptors and Ratings

Rail contractors that elect to mimic the consequence descriptors in use by other organisations should ensure that they are appropriate to their own operations first and make adjustments accordingly – a loss of \$2 million may be catastrophic to one operator, while a loss of \$20,000 is catastrophic to another. Consequences need to be real, relevant and applicable.

4 Risk Matrix

A risk matrix assists the contractor in considering the relationship between likelihood and consequence to determine the overall level of risk. The matrix will show how the various combinations of likelihood and consequence work together to describe different levels of risk. There is no defined requirement for layout – i.e. consequence or likelihood to be in rows or in columns. This is at the discretion of the operator, though some studies show that consequence is better as the row, and likelihood the column.

When developing a risk matrix and what actions are required, questions to consider should include:

- > *What do we want this matrix to tell us and what do different risk level descriptions, and therefore the risks, actually mean to our operations?*
- > *Is this risk matrix practical and appropriate for our operations?*
- > *At what point does the risk become unacceptable or intolerable?*
- > *Are the levels of risk that we have compiled suitable for our operations?*
- > *What levels of sign off (if any) are required for various levels of risk?*
- > *Who is required to sign off, approve or accept different levels of risk?*
- > *What is the level of governance or management oversight that is required?*
- > *Do we have processes in place to approve / authorise higher risk activities?*
- > *How will risk levels be monitored? And by who and when?*

TU should review the descriptors for each likelihood and consequence and consider how they will rate the risk if the various combinations are made. This step is a direct link to what the operator can bear – what risks can be ‘tolerated’ and which cannot.

Numbering of descriptors may be used to provide an indicative ‘risk score’. Again, there is not a set requirement as to how the score is calculated. Most operators will either multiply the score (L1 x C4 = 4) or add them together (L1 + C4 = 5), or rank each box from 1 to 25 in order of priority.

The risk matrix is usually colour coded to visually indicate which combinations of likelihood and consequence are of higher or lower risk.

The risk score (or colour coding if used) should then link to actions to be taken and authorities to be applied for each level of risk, as indicated in the examples below:

Risk matrix with risk score:

		Likelihood				
		5	4	3	2	1
Consequence		Almost Certain	Very Likely	Likely	Unlikely	Rare
5	Catastrophic	25	20	15	10	5
4	Major	20	16	12	8	4
3	Moderate	15	12	9	6	3
2	Minor	10	8	6	4	2
1	Insignificant	5	4	3	2	1

Some companies choose to remove the numbers and add a description of the risk level:

		Likelihood				
		5	4	3	2	1
Consequence		Almost Certain	Very Likely	Likely	Unlikely	Rare
5	Catastrophic	Extreme	Extreme	Extreme	High	Medium
4	Major	Extreme	Extreme	High	Medium	Medium
3	Moderate	Extreme	High	High	Medium	Low
2	Minor	High	Medium	Medium	Medium	Low
1	Insignificant	Medium	Medium	Low	Low	Low

Risk matrix with risk priority ranking from 1 to 25:

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	16	10	6	3	1
Very Likely	19	14	9	5	2
Likely	22	18	12	8	4
Unlikely	24	20	17	13	7
Very Unlikely	25	23	21	15	11

Figure 3 – Example Risk Matrices

Colour & Risk Score	Level of Risk	Action Required
1-3	Low	Due diligence must be applied to ensure all controls remain effective and continue as normal.
4-9	Medium	Monitor risk controls to ensure they remain effective and routinely consider new or additional control options.
10-15	High	Regular review of all risk controls and their effectiveness and consideration of new or additional control options to reduce risk. Management attention and sign off required to continue activity.
16-25	Extreme	Stop activity immediately – Actions must be taken to minimise the risk before activity can commence or continue – Board / Executive Committee approval required to continue or commence activity.

Figure 4 – Example Risk Action Table

It is very important to note that regardless of the level of risk, the Pm's, Super's and Foreman must implement all controls that are reasonably practicable.

5 Next Steps

Once these initial steps have been followed and the risk matrix is developed, it should be formally adopted and integrated into the documented risk management procedures as part of the SMS. Then risk assessments can then commence.

It is essential that those who conduct or attend risk assessments understand what needs to be done, and why they are being done – they are not an administrative exercise but will help to build a safety culture and safer working environment, as well as demonstrating legal compliance.

Each supervisor should ensure that their procedures reflect what they do now, and not what they would like to do. Like all procedures, risk management procedures will be part of regular reviews and can change in line with changes in the operations.