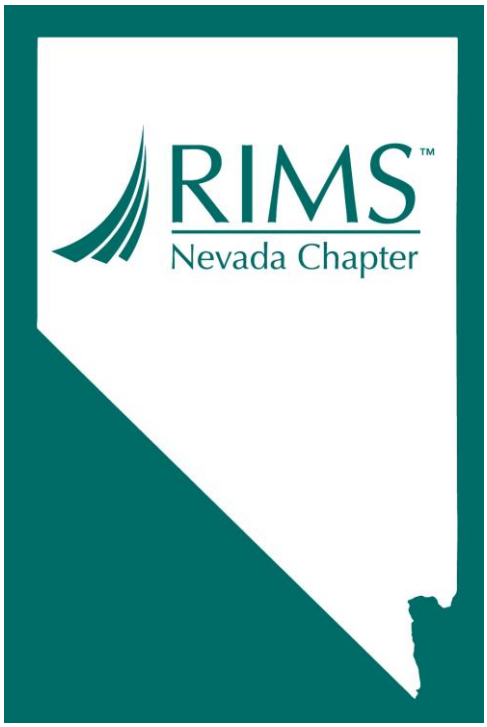
NEVADA CHAPTER OF RIMS



Risk Assessment

A Risk is the amount of harm that can be expected to occur during a given time period due to specific harm event (e.g., an accident). Statistically, the level of risk can be calculated as the product of the probability that harm occurs (e.g., that an accident happens) multiplied by the severity of that harm (i.e., the average amount of harm or more conservatively the maximum credible amount of harm). In practice, the amount of risk is usually categorized into a small number of levels because neither the probability nor harm severity can typically be estimated with accuracy and precision.

A Risk Matrix is a matrix that is used during Risk Assessment to define the various levels of risk as the product of the harm probability categories and harm severity categories. This is a simple mechanism to increase visibility of risks and assist management decision making.

Although many standard risk matrices exist in different contexts (US DoD, NASA, ISO),[1][2][3] individual projects and organizations may need to create their own or tailor an existing risk matrix.

For example, the harm severity can be categorized as:

Catastrophic - Multiple Deaths
Critical - One Death or Multiple Severe Injuries
Marginal - One Severe Injury or Multiple Minor Injuries
Negligible - One Minor Injury
The probability of harm occurring might be categorized as 'Certain', 'Likely', 'Possible', 'Unlikely' and 'Rare'. However it must be considered that very low probabilities may not be very reliable.

The resulting Risk Matrix could be:

	Negligible	**Marginal**	**Critical**	**Catastrophic**
Certain	High	High	Extreme	Extreme
Likely	Moderate	High	High	Extreme
Possible	Low	Moderate	High	Extreme
Unlikely	Low	Low	Moderate	Extreme
Rare	Low	Low	Moderate	High

The company or organization then would calculate what levels of Risk they can take with different events. This would be done by weighing up the risk of an event occurring against the cost to implement safety and the benefit gained from it.

The following is an example risk matrix with certain accidents allocated to appropriate cells within the matrix:

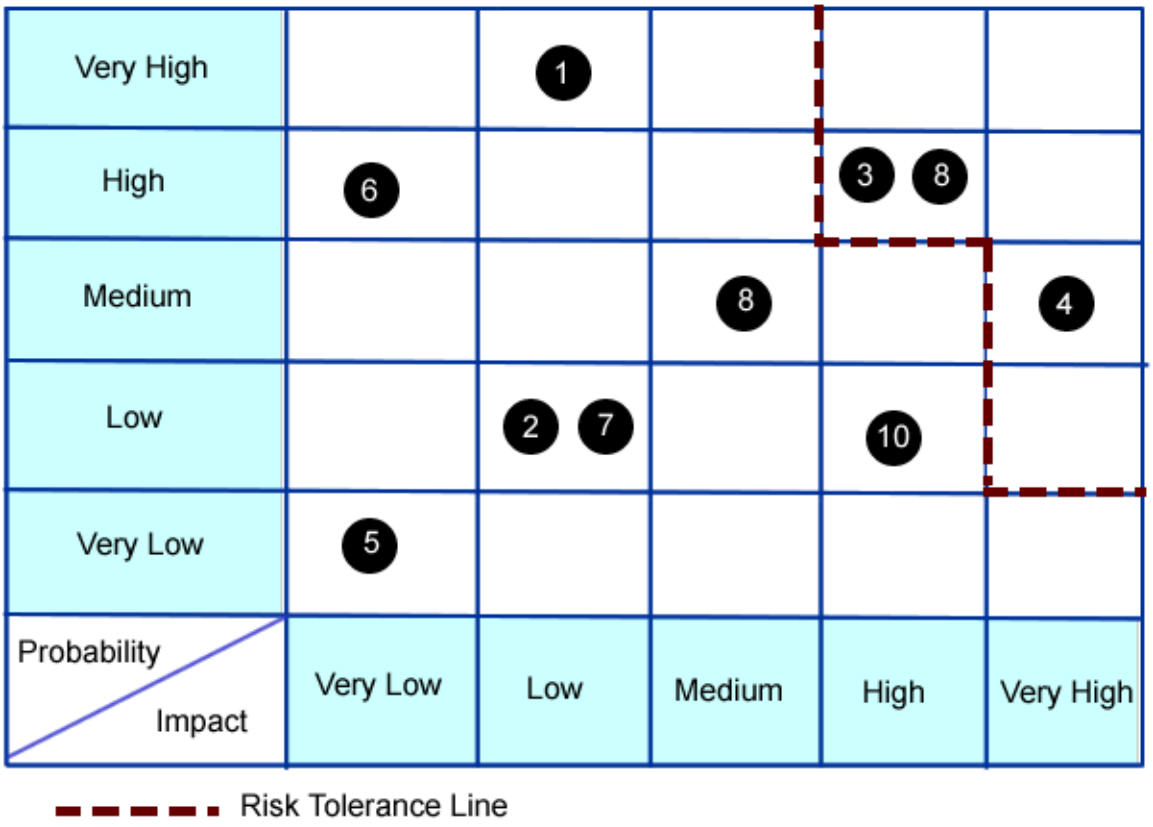
	Negligible	**Marginal**	**Critical**	**Catastrophic**
Certain	Stubbing Toe			
Likely		Minor Car Accident		
Possible			Major Car Accident	
Unlikely			Aircraft Crash	
Rare				Major Earthquake

Another Example:

This is a simple mechanism to increase visibility of risks and assist management decision making. It is a graphical representation of information normally found in existing Risk Logs. It is only one possible representation of a project's risk status.

The Project Board may choose to have an easy-to-read diagram, for example, included in the Highlight Report.

Risk Analysis:	Current Risk Rating (before change control)			Target Risk Rating (after change control)		
	Likelihood	Impact	Rating	Likelihood	Impact	Rating
	◉	○	High	○	○	High
	○	◉	Medium	◉	○	Medium
	○	○	Low	○	◉	Low
	3 x 2 = 6			2 x 1 = 2		



Risk Tolerance & Risk Appetite

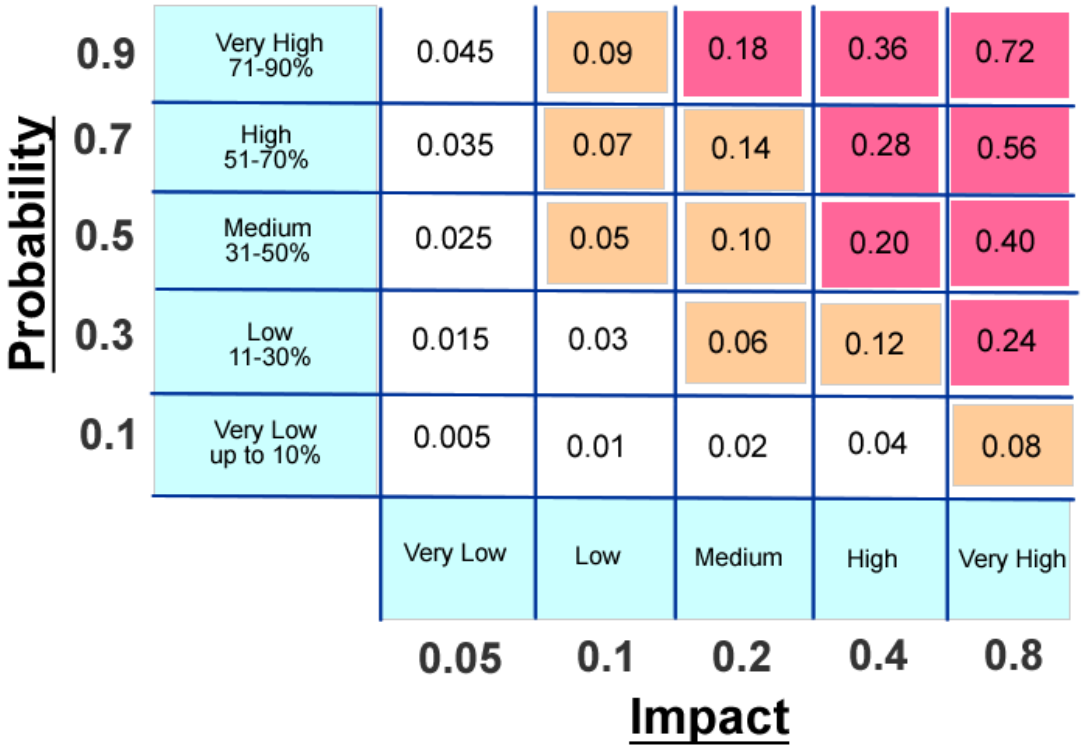
Risk tolerance looks at acceptable/unacceptable deviations from what is expected.

Risk appetite looks at how much risk a company is willing to accept. There can still be deviations that are within a risk appetite. Before determining what to do about risks, the Project Board and Project Manager must consider the amount of risk they are prepared to tolerate. This will vary according to the perceived importance of particular risks. For example, the view of financial risks and how much the project team is prepared to put at risk will depend on a number of variables, such as budgets, the effect on other parts of the program or organization or additional risks such as political embarrassment. A project team may be prepared to take comparatively large risks in some areas and none at all in others, such as risks to health and safety.

Risk tolerance can be related to other tolerance parameters; risk to completion within time scale and/or cost and to achieving product quality and project scope within the boundaries of the Business Case.

Perceptions of risk tolerance have to be considered in detail to establish the optimum balance of a risk occurring against the costs and value for money of limiting that risk.

The organization's overall tolerance of exposure to risk must also be considered as well as a view of individual risks.



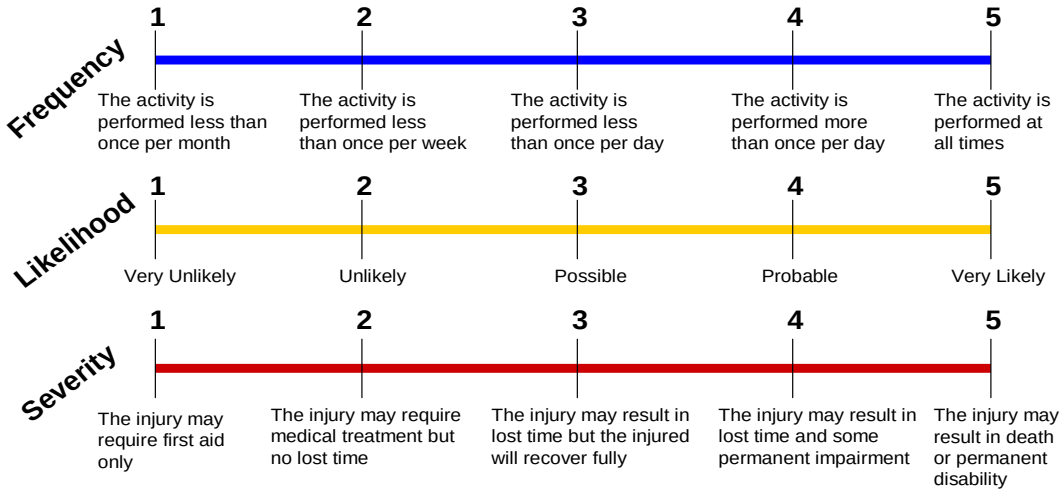
Risk Assessment

- Understanding and Prioritizing Risk
  - Frequency (F) how often the task is done
  - Likelihood (L) likelihood of adverse event (injury) when task is done
  - Severity (S) extent of injury

How to Measure The Risk

- Risk Score = F x L x S
  - Risk for each concern identified
- Risk Index = Sum of all risk scores
  - Risk in the system for the task overall

Sample DOA Risk Assessment



How to Measure The Risk

- Risk Score = F x L x S
  - Risk for each concern identified
- Risk Index = Sum of all risk scores
  - Risk in the system for the task overall

An R3 Analysis
High Rack Stocking & Picking

Event of Concern	Existing Controls	New Controls	F	L	S	R
Handling packages at extended reach resulting in muscle strains	Training and education in safe lifting & material handling		4	5	3	60
Fall from Elevation – Restraint Lanyard not attached to anchor point resulting in multiple injures	System designed to standards, Routine Inspection, 80% performance in attaching lanyards		4	3	5	60

Risk Index= 120

Analysis With <u>New Controls</u> In Place
High Rack Stocking & Picking

Event of Concern	Existing Controls	New Controls	F	L	S	R
Handling packages at extended reach resulting in muscle strains	Training and education in safe lifting & material handling	Stock heavy packages on pull-out racks at floor level Place & Pick at floor level	4	3	3	36
Fall from Elevation – Restraint Lanyard not attached to anchor point resulting in multiple injuries	System designed to standards, Routine Inspection, 80% performance in attaching lanyards	Manage performance in lanyard attachment to 95%	4	2	5	40

Residual Risk = 76

Measurement
Risk Reduction Achieved

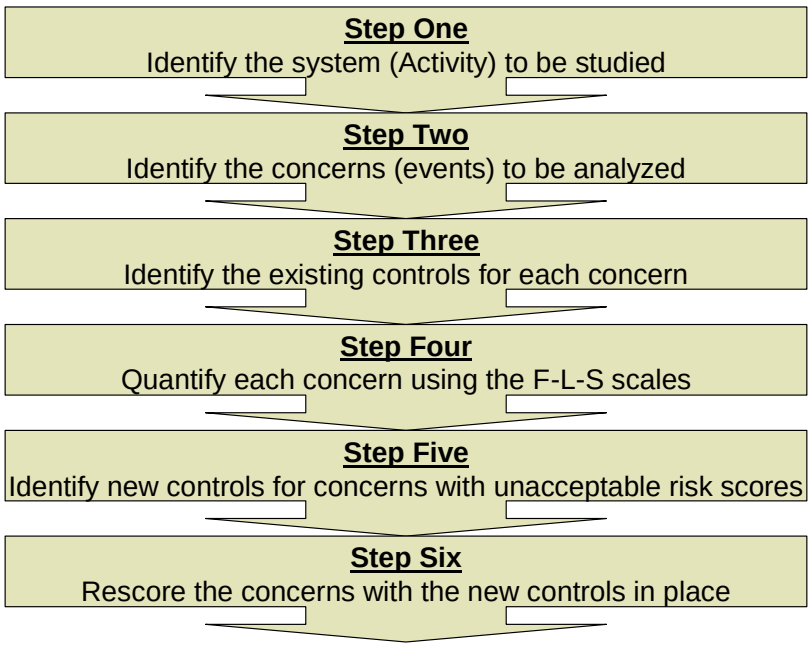
Residual Risk with Existing Controls = 120

Residual Risk with New Controls = 76

$$\frac{120 - 76}{120} \times 100 = 37\%$$

R3 = 37%

Residual Risk Reduction



Risk Assessment Worksheet

Task: _____

Event of Concern	Existing Controls	New Controls	F	L	S	R

Risk Index=

Risk Assessment Worksheet

Task: _____

Event of Concern	Existing Controls	New Controls	F	L	S	R

Risk Index=

Risk Assessment Worksheet

Task/Area/Process: _____

Event or Concern	Existing Controls	New Controls (Complete on Second Assessment)	F	L	S	R F x L x S = R