THIS GUIDE IS TO BE READ IN CONJUNCTION WITH THE QUICK GUIDE TO MANAGING PROJECT RISK

Pedagogical advantages

All projects and organisations have uncertainties from internal and external factors. The effect that these uncertainties have on objectives are risks. As engineers, students will regularly be faced with risks and should understand that there are processes, tools and techniques that should be implemented to manage risk.

Organisations should have a risk management standard or framework that describes its processes for managing risks of all types, as well as defining their appetite for risk. The tools, techniques and risk matrices may differ between organisations, but students should be aware of the main tools and processes used, and that the use of these should be directed by the organisation.

Whilst a risk assessment exercise is a fundamental tool used in managing risk, it forms only part of overall risk management. The risk register created from a risk assessment at the start of the project remains a live document for recording, communicating, reviewing and monitoring project risks and is reviewed throughout and after the project. Students should understand the on-going and cyclical nature of risk management.

Safety risks arise from hazards. In Australia, hazards need to be managed according to Work, Health and Safety legislated 'duties of designers' whereas other risk types do not. It is important therefore that engineering students understand the difference between what is a hazard and what is a risk. Hazards should be identified and listed separately from other risk types. The subsequent management process and procedure to manage safety hazards is different from the procedure to manage other risk types.

Assessment

In order for students to practice and be assessed on their understanding of managing project risk, it is necessary for them to have a project or assignment with some risks, whether they be technical, schedule, or budget in nature, and for which the student has scope to be able to take actions to control the risks. A large, group project with diverse risks would be ideal: however, management of a few risks on smaller projects is still a worthwhile exercise.

A risk assessment could be performed as a stand-alone exercise, but it would be beneficial for the student to be able to follow through with the management of risk to observe how the risk is managed throughout the project and how the management of risk can affect outcomes.

Implementation

Students should be provided with a risk assessment matrix, such as presented in the accompanying Quick Guide, to implement risk management techniques (identify and analyse project risks), prioritisation, risk response (action / treatment / control) planning and implementation, monitoring and reviewing risks) for either a real or hypothetical project scenario.

Students should identify the key stakeholders required for successful risk management. The risk assessment should be performed as a group, involving all the members of the project team and other stakeholders, to brainstorm and identify the foreseeable risks. Prompts may assist in the identification of risks. These may include:

- Scope
  - Design change
  - Additional deliverables
- Schedule
  - Estimation
  - Delays
  - Procurement lead time
- Resources
  - Budget
  - People
  - Tools
  - Materials
- Technical
  - Fit-for-purpose
  - Integration / interfaces
  - Technological maturity
  - Safety (see note below)

Having identified the risks, students can then evaluate them according to the risk assessment matrix, and plan and allocate responsibilities for actions. The risk assessment and any accompanying minutes should be submitted for assessment.

As the project progresses, students should review the risk assessment, ensuring all planned actions are being undertaken and whether circumstances have changed to reveal new risks, or if any risks have accumulated to affect outcomes.

NOTE: Safety hazards and their associated uncertainties (risk) should be listed and treated separately from other risk types. Mixing (listing) safety risks with non-safety risks is a common and fundamental error. Regarding safety risks: refer to the Quick Guide to Hazard Identification. Safety comes about by identifying hazards and applying the hierarchy of controls to change designs; it rarely comes-about by risk ranking. Residual hazards (there are always residual hazards with designs) can then be ranked for risk (uncertainty).

Indicative assessment

For a given project, students assess, monitor and manage risk. Students then document the risk assessment, monitoring and management processes and decisions. Templates can be provided for this to support the consistency of the type of information gathered and the form it is reported in.

Management of risk will include ensuring relevant stakeholders are informed in an appropriate and timely manner, and responding to identified risks with an appropriate strategy – mitigation/reduction, elimination or acceptance. Management will also require allocation of appropriate resources dependant on the response chosen.

Sample instructions

Perform a risk assessment on the project to identify and analyse the risks to the delivery and completion of the project.

A risk assessment template and risk assessment matrix are provided. The risk assessment exercise should include all members of the project team plus any other project stakeholders.

The risk assessment is a group exercise and a single risk assessment should be submitted for assessment.

The risk register from the risk assessment should be maintained and updated throughout the project as new risks are identified and actions are implemented.

The updated risk register should be submitted with final project deliverables.

Indicative Rubric

	Not Satisfactory	*Satisfactory*	*Very Good - meets Satisfactory criteria plus…*
Risk Identification	No risks identified Risks identified have no credible consequences to the project	Risk assessment identifies some risks Risks identified have credible consequences to the project	Risk assessment identifies multiple risk types Risk assessment is updated as the project progresses with new identified risks
Risk Assessment	Risks not evaluated according to the risk assessment matrix	Risks evaluated according to the risk assessment matrix	Risks prioritised based on significance
Risk Management	No risk management strategies identified No actions planned	Risk management strategies identified Actions planned and responsibilities allocated	Risk management strategies effectively implemented Risk assessment is updated to reflect when management strategies are implemented

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Frequently asked questions

1. What is the difference between a risk and a hazard?

Refer to the Quick Guide to Hazard Identification.

2. What are the common steps to manage risk?

1. Identify risks: What are your risks and how likely are they to occur? Assess both the likelihood and potential severity of each risk to prioritise your planning efforts.

2. Minimise or eliminate risks: Once risks have been identified you need to either eliminate or minimise those risks. You should provide specific strategies for minimising risk.

3. Identify who has to do what should a disaster occur: One of the simplest and most powerful tools for a speedy recovery from a disaster is a clear picture of, and clear directions about, who has to do what should your disaster plan have to be enacted.

4. Determine and plan your recovery contingencies: Recovery contingencies should be determined by the type, style and size of your project and by the extent of the damage.

5. Communicate the plan to all the people it refers to: Ensuring that all people affected by your project (team members, project sponsor, suppliers, collaborators, clients) are made aware of the strategies you have put in place to either mitigate or recover from a disaster situation. Include deciding and communicating how to communicate – remembering there may be different protocols for different stakeholders.

6. Prepare a risk management plan: A risk management plan can help minimise the impact of risks should they occur, but only if it is communicated and understood by all those that need to follow it and if it is followed by all relevant stakeholders.

Adapted from Business Victorai http://www.business.vic.gov.au/disputes-disasters-and-succession-planning/how-to-manage-risk-in-your-business/prepare-a-risk-management-plan

3. What are the common strategies for managing risk?

Also refer to the Quick Guides for Risk Management and for Hazard Identification.

Risk response plans are aimed at the following targets:

1. Eliminating the risk

2. Lowering the probability of risk occurrence

3. Lowering the impact of the risk on the project objectives

Lavanya, N., & Malarvizhi, T. (2008). *Risk analysis and management: A vital key to effective project management*. Paper presented at the PMI® Global Congress 2008—Asia Pacific, Australia. https://www.pmi.org/learning/library/risk-analysis-project-management-7070

Further Reading & References

How to manage work health and safety risks: Code of practice (2018). Safe Work Australia Retrieved from https://www.safeworkaustralia.gov.au/system/files/documents/1901/code_of_practice_-_how_to_manage_work_health_and_safety_risks_1.pdf
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