

FOR THIS ASSESSMENT I WILL USE A SOLAR INSTALLATION PROJECT

1 Identify project risks
1.1A. Determine project risk objectives, standards and context, with input from stakeholders. As the PM I would consult with the building contractor, sponsor and site supervisor to determine and come to agreement regarding: Risk management objectives – My beliefs: The objectives of project risk management are to minimise and/or eliminate the factors and uncertainties that could affect or impact the objectives of the project being achieved. Steps would include brainstorming to identify, categorise, analyse & manage the risks. Some risks can never be totally eliminated or avoided, so having a plan of attack that can be implemented should the risk become an incident is paramount. Standards - The Standards will be like a guide to help make sure risk management is done properly. We will use the risk management standards, processes and procedures in the National Electrical Communications Association Safety Management System. These include regular reviews of risks as the project progresses. Context – Internal & external circumstances & rules that we operate under, which affect the business. Internal Context (usually operational); Risks that can arise from decisions made within the organisation (e.g: poor judgement, mis-calculations in terms of time and/or materials, poor staff selection); Organisational objectives & operations (e.g: inefficient methods being used, poor supervisor of employees etc...) External context (usually strategic): Looking at the environment & legal framework. Regulatory (e.g: CEC, Council, Ergon) rules & regulations; weather
1.1B. Identify project risks using valid and reliable risk identification methods. <i>SWOT analysis:</i> <i>Strengths:</i> • <i>We have carried out this type of project many times before (experienced)</i> • <i>Co-operative sponsor with a flat hierarchical organisational structure</i> • <i>Good profit margin – generous contingencies</i> <i>Weaknesses</i> • <i>Totally at the mercy of the weather</i> • <i>Small work force to draw from</i> • <i>Lack of leadership skills from site supervisor</i> <i>Opportunities</i> • <i>New inverter soon to be released which would make adding batteries easier and cheaper (potential to upgrade the sponsor to the new inverter)</i> • <i>Possibility of fixing the STC value with a new broker to maximise profit.</i> • <i>Preparation of a case study to be used for promotional purposes.</i> <i>Threats</i> • <i>Loss of staff to competitors</i> • <i>Materials becoming unavailable in the quantity needed & in the time frame needed.</i> • <i>Paperwork not being carried out throughout the process (e.g: serial numbers not being scanned properly or photos being blurry & not admissible to the broker)</i> • <i>Changes to minor component pricing – e.g: cable, isolators</i>

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1.1C. Classify project risks within agreed risk categories.							
	Likelihood of Occurrence	Potential Impact /	Inherent risk rating without any controls	Control -Elimination -Substitution -Isolation -Engineering -Administrative - PPE	Treatment	Resultant Risk Rating after controls	Personnel responsible for control / treatment
COMMUNICATION RISKS:							
Miscommunication or lack of communication leading to conflict between team members.	Occasionally	Moderate	High	Administrative	Implementation of clear & consistent communications (team meetings, morning huddles)	Moderate	Site Supervisor
Lack of communication / information from supervisor to team members leading to work being defective	Occasionally	Moderate	High	Administrative	Implementation of clear & consistent communications (team meetings, morning huddles)	Moderate	Site Supervisor
COMPLIANCE RISKS:							
REPQ Engineer requiring change to be made before signing off the commissioning paperwork	Unlikely	Moderate	Moderate	Administrative	Obtaining engineering checklist prior to commissioning to ensure all requirements are met	Moderate	PM
STC broker not accepting the commissioning paperwork	Rare	Minor	Low	Administrative	Double checking paperwork before submission	Low	Admin support
CER auditing & finding non-compliance	Unlikely	Major	High	Administrative (written checklists, training)	Supervisor to undertake checks and inspections throughout the process. Staff to be adequately trained about quality requirements.	High	Site Supervisor
Ergon changing the requirements mid-project	Rare	Major	High	Administrative	Keeping abreast of potential upcoming changes. Photographing progress of the project as proof if required by Ergon.	High	Site Supervisor
ENVIRONMENTAL RISKS:							
Project not being delivered on time due to bad weather (e.g: rain, high winds)	Occasionally	Major	Very High	Administrative	Scheduling work to ensure that all outside work is done before inside.	High	PM Site Supervisor
FINANCIAL RISKS:							
Project going over budget due to labour costs blowing out.	Occasionally	Moderate	High	Administrative	Hiring suitably qualified staff. Ensuring staff have necessary tools & equipment to do the work efficiently. Supervisor monitoring performance closely to quickly identify if the work is taking too long to complete.	Moderate	PM Site Supervisor

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<i>The value of STCs falling below the quoted value and increasing the out-of-pocket cost to the sponsor</i>	Unlikely	Major	High	Administrative	Fixing STC pricing with broker prior to project starting	Low	Admin support
<i>Component pricing increasing</i>	Unlikely	Moderate	Moderate	Administrative	Getting written quotes for all components at commencement of the project.	Low	Admin support
<i>Sponsor being late with, or deliberately delaying payment impacting on cash flow</i>	Unlikely	Major	High	Administrative	Formal contract to be signed between us & sponsor prior to commencement	High	PM
HEALTH & SAFETY RISKS:							
<i>Injury to installers E. g: Fall from roof, strains/sprains/injury from manual handling</i>	Occasionally	Major	Very High	Administrative (training, procedures) PPE	Train installers properly in manual handling. Ensure installers have equipment to do the work safely.	Moderate	Site Supervisor
<i>Heat exhaustion (depending on when the project starts)</i>	Unlikely	Major	High	Administrative (training, procedures) PPE	Monitor weather conditions & installers condition for signs of heat stress/exhaustion	Moderate	Site Supervisor
HR RISKS:							
<i>Key personnel leaving the organisation (or being sick for an extended period) during the project</i>	Unlikely	Moderate	Moderate	Administrative	Ensure employees are satisfied in their working conditions – enhance morale, adequate communication, regular reviews.	Low	PM Site Supervisor
LEGAL RISKS:							
<i>Sponsor suing for damages for project delays</i>	Rare	Moderate	Moderate	Elimination through Administrative means	Ensure the contract doesn't include liquidated damages	Low	PM
ORGANISATIONAL BRAND RISKS:							
<i>Reputation being damaged if project deadline is not achieved (or quality is not of necessary standard)</i>	Unlikely	Minor	Low	Administrative (Written procedures)	PM to monitor progress regularly & if there is likely to be any delays, communicate with the sponsor ASAP.	Low	PM
<i>Reputation being damaged by behaviour of staff (e.g: swearing on site)</i>	Rare	Minor	Low	Administrative (Written training procedures)	Staff to be inducted & instructed on appropriate behaviour & expectations	Low	Site Supervisor
POLITICAL RISKS:							
<i>Government changing the STC policies and/or making announcements that would impact on the value of the STCs.</i>	Unlikely	Moderate	Moderate	Elimination	Fix price of STCs with broker prior to commencement of project	Low	Admin support
PROJECT ASSUMPTIONS (SCOPE) RISKS:							
<i>The sponsor changing their mind about what they want;</i>	Unlikely	Moderate	Moderate	Elimination through Administrative	Ensure contract is signed & all paperwork is specific prior to commencement	Low	PM

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<i>The panels not physically fitting on the roof due to unknown problems/issues with the roof so the size of the system would have to be reduced;</i>	Unlikely	Moderate	Moderate	Administrative (pre-installation checklist)	Do comprehensive site visit prior to commencement of project & signing of contract	Low	Site Supervisor PM
QUALITY RISKS:							
<i>Work not being carried out with the required level of quality (e.g: panels being crooked)</i>	Occasionally	Moderate	High	Administrative (Written procedures)	Communicate with installers adequately at all stages of the project. Supervisor to monitor quality continuously.	Moderate	Site Supervisor
<i>Necessary testing not being carried out at the required intervals</i>	Unlikely	Minor	Low	Administrative (Written Procedures)	Communicate with installers adequately at all stages of the project. Supervisor to monitor quality continuously.	Low	Site Supervisor
PHYSICAL RISKS:							
<i>Products not being delivered when required (e.g: shortage of stock) leading to delays</i>	Unlikely	Moderate	Moderate	Administrative	Suppliers to be contacted prior to commencement of the project to ensure delivery will be on schedule.	Low	PM Admin support
<i>Panels being damaged (e.g: motor vehicle accident, being dropped)</i>	Unlikely	Minor	Low	Administrative (training, procedures) PPE	Ensure staff are trained in appropriate manual handling techniques & that they have the necessary tools & equipment to move the equipment safely. Use of gloves & lifting equipment for moving of panels.	Low	Site Supervisor
TECHNOLOGY RISKS:							
<i>The firmware/software for the monitoring to change and/or have different requirements to those that prevailed at the time of preparing the proposal.</i>	Rare	Minor	Low	Elimination through Administrative (Procedures / pre & post installation checklist)	Ensure all firmware updates are carried out at commissioning.	Low	Site Supervisor
<i>Non-existent or not strong enough WiFi signal for the inverter monitoring.</i>	Occasionally	Minor	Moderate	Elimination (contract clause) Administrative (Procedures / pre-installation checklist)	Getting sponsor to provide proof of signal prior to the project commencing. Ensuring that there is a clause in the contract about the internet connectivity & strength.	Low	Site Supervisor
SOCIAL RISKS: None identified.							
PROJECT CONSTRAINTS: None identified.							

2 Analyse project risks

1.2A. Determine risk analysis classification criteria and apply to agreed risk ranking system.

Risk ranking/rating is a product of likelihood of a risk occurring and the extent of the impact of that risk occurring.

The VERY HIGH risks need immediate action & involvement from senior management.

The HIGH risks need action in the short term & strategies to treat the risk need to be identified.

The MODERATE risks need to a response identified and risks need to be monitored to ensure they don't change.

The LOW risks should be monitored by routine procedures and methods.

Likelihood	Consequence				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Severe 5
A (Almost certain)	High	High	Very High	Very High	Very High
B (Likely)	Moderate	High	High	Very High	Very High
C (Occasionally)	Low	Moderate	High	Very High	Very High
D (Unlikely)	Low	Low	Moderate	High	Very High
E (Rare)	Low	Low	Moderate	High	High

Assuming the project is to be completed during November – December in Toowoomba (it would be different likelihood if the project was carried out during the winter months).

The likelihood of bad weather is medium, and the severity of the impact would be Major.

This gives it a rating of Very High. In the event of bad weather, immediate action would be required & management would need to be involved. Given the Very High risk rating, it would be essential to have treatment strategies in place.

LIKLIHOOD SCORE		E. g Bad weather affecting workflow	SEVERITY OF IMPACT SCORE	E. g Bad weather affecting workflow
Very High – ALMOST CERTAIN	< 75%	Constant storms and/or high wind	Severe	Both inside and outside work is unsafe for the entire project period. No work can be carried out inside or outside.
High LIKELY	50 – 74%	Persistent & recurrent periods of bad weather	Major	Outside work is unsafe for most of the project period. Inside work could be carried out at most times (except for example in periods of a black out caused by weather).
Medium OCCASION ALLY	25 – 49	Recurring periods of bad weather	Moderate	Outside work is unsafe for around half of the project period. Inside work could be carried out at any time.
Low UNLIKELY	10 – 24%	Occasional periods of bad weather	Minor	Outside work is unsafe for only some of the time. Inside work could be carried out at any time.
Very Low RARE	< 10%	Very few, if any periods of bad weather	Negligible/ Insignificant	Outside work is almost always safe. Inside work could be carried out at any time.

1.2B. Use risk analysis processes, within delegated authority, to analyse and qualify risks, threats and opportunities.

For the solar project I would use Qualitative Risk assessment methods as quantitative is not as practically feasible. The risks were identified and categorised in the table in question 1.1C.

1.2C. Determine risk priorities in agreement with project client and other stakeholders.

Risk priorities Very high -> low.

	Low Risk	Moderate Risk	High Risk	Very High Risk
<i>Injury to installers E.g: Fall from roof, strains/sprains/injury from manual handling</i>				Very High
<i>Project not being delivered on time due to bad weather (e.g: rain, high winds)</i>				Very High
<i>Lack of communication / information from supervisor to team members leading to work being defective</i>			High	
<i>Miscommunication or lack of communication leading to conflict between team members.</i>			High	
<i>CER auditing & finding non-compliance</i>			High	
<i>Ergon changing the requirements mid-project</i>			High	
<i>Project going over budget due to labour costs blowing out.</i>			High	
<i>The value of STCs falling below the quoted value and increasing the out-of-pocket cost to the sponsor</i>			High	
<i>Work not being carried out with the required level of quality (e.g: panels being crooked)</i>			High	
<i>Sponsor being late with, or deliberately delaying payment impacting on cash flow</i>			High	
<i>Heat exhaustion (depending on when the project starts)</i>			High	
<i>Key personnel leaving the organisation (or being sick for an extended period) during the project</i>		Moderate		
<i>Engineer requiring change to be made before signing off the commissioning paperwork</i>		Moderate		
<i>Sponsor suing for damages for project delays</i>		Moderate		
<i>Government changing the STC policies and/or making announcements that would impact on the value of the STCs.</i>		Moderate		
<i>The sponsor changing their mind about what they want;</i>		Moderate		
<i>Component pricing increasing</i>		Moderate		
<i>The panels not physically fitting on the roof due to unknown problems/issues with the roof so the size of the system would have to be reduced;</i>		Moderate		
<i>Products not being delivered when required (e.g: shortage of stock) leading to delays</i>		Moderate		
<i>Non-existent or not strong enough WiFi signal for the inverter monitoring.</i>		Moderate		
<i>The firmware/software for the monitoring to change and/or have different requirements to those that prevailed at the time of preparing the proposal.</i>	Low			
<i>STC broker not accepting the commissioning paperwork</i>	Low			
<i>Panels being damaged (e.g: motor vehicle accident, being dropped)</i>	Low			
<i>Necessary testing not being carried out at the required intervals</i>	Low			
<i>Reputation being damaged if project deadline is not achieved (or quality is not of necessary standard)</i>	Low			
<i>Reputation being damaged by behaviour of staff (e.g: swearing on site)</i>	Low			

1.2D. Document risk analysis outcomes for inclusion in risk register and risk management plan.

The risks identified in questions 1.1C and 1.2C would be added to the risk register & risk management plan.

3 Establish risk treatments and controls	
1.3A.	Identify and document existing risk controls. The risk controls are shown in question 1.1C
1.3B.	Consider and determine risk treatment options using agreed consultative methods. The risk treatments that were determined are shown in question 1.1C
1.3C.	Record and implement agreed risk treatments. The risk treatments that were determined are shown in question 1.1C
1.3D.	Update risk plans and allocate risk responsibilities to project team members. The risk treatments/control responsibilities are shown in question 1.1C

4 Monitor and control project risks	
1.4A.	Establish regular risk review processes to: • Maintain currency of risk plans. • Monitor risk environment to identify changed circumstances impacting project risks. Because risks can (and do) change throughout the project, I would undertake regular reviews of the project risks. As the project progresses, risks may be: • Greatly reduced in likelihood or severity of the consequence (e.g: mid-way through the project, the likelihood of weather affecting the project would be much lower than at the start) • Higher than at the start of the project (e.g: if labour times are blowing out), • Totally eliminated and no longer a risk (e.g: WiFi having been connected and strong enough means that is no longer a risk) • New risks may emerge (e.g: if asbestos is uncovered in the ceiling)
1.4B.	Determine risk responses to changed environment. Part of reviewing the risks throughout the project would include working out the most appropriate responses to the changed environment/conditions. In the example above where the new risk of asbestos has been found, the response would be to determine what actions need to be taken to mitigate (or eliminate) the risk. If the area of asbestos was small, paying an asbestos removal company and builder to repair the area may be appropriate.
1.4C.	Implement agreed risk responses and modify plans to maintain currency of risk treatments and controls. While the risk management plan would be revised to include the new risks identified and changes to the existing risks, the treatments and controls would also need to be reviewed to ensure they are still relevant and the most appropriate measures.

5 Assess risk management outcomes	
1.5A.	Review project outcomes to determine effectiveness of risk-management processes and procedures. At completion, the project outcomes would be reviewed to determine how effective the risk management processes and procedures were. E.g: for this project, I would add another column to the table in Question 1.1C called "Review" in which I would rate the effectiveness of the risk control/treatment measures. I would ask questions including: • Did the risks identified eventuate? If so, what could be done to prevent them in future projects (e.g: if panels were broken due to mishandling, what procedures could be implemented to prevent a recurrence?) • Were the risks eliminated or at least reduced to an acceptable limit (e.g: did <u>any</u> staff still suffer heat stroke?) • Were there other risks that weren't identified at the start of the project that should have been?

1.5B. Identify and document risk management issues and recommended improvements for application to future projects.

Similar to 1.5A above, I would examine the risk management issues that developed during the project to work out improvements to the risk assessment, management etc... for future projects.

E.g: if a key team member left the organisation during the project, adding the requirement to carry out an exit interview would be invaluable to help work out strategies to avoid a recurrence on future projects.

Or for example, if there were quality issues, even with adequate communication identified in the risk assessment, the introduction of written procedures or video procedures may be an effective means of eliminating the risk and issues on future projects.