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# Executive summary

Risk is defined as an event that has a probability of occurring, and could have either a positive or negative impact to a project should that risk occur. A risk may have one or more causes and, if it occurs, one or more impacts.

Risk management is an ongoing process that continues through the life of a project. It includes processes for risk management planning, identification, analysis, monitoring and control. Many of these processes are updated throughout the project lifecycle as new risks can be identified at any time. It’s the objective of risk management to decrease the probability and impact of events adverse to the project.

The identification of risk normally starts before the project is initiated, and the number of risks increase as the project matures through the lifecycle. When a risk is identified, it’s first assessed to ascertain the probability of occurring, the degree of impact to the schedule, scope, cost, and quality, and then prioritized. Risk events may impact only one or while others may impact the project in multiple impact categories. The probability of occurrence, number of categories impacted and the degree (high, medium, low) to which they impact the project will be the basis for assigning the risk priority. All identifiable risks should be entered into a risk register, and documented as a risk statement.

As part of documenting a risk, two other important items need to be addressed. The first is mitigation steps that can be taken to lessen the probability of the event occurring. The second is a contingency plan, or a series of activities that should take place either prior to, or when the event occurs. Mitigation actions frequently have a cost. Sometimes the cost of mitigating the risk can exceed the cost of assuming the risk and incurring the consequences. It is important to evaluate the probability and impact of each risk against the mitigation strategy cost before deciding to implement a contingency plan. Contingency plans implemented prior to the risk occurring are pre-emptive actions intended to reduce the impact or remove the risk in its entirety. Contingency plans implemented after a risk occurs can usually only lessen the impact.

Identifying and documenting events that pose a risk to the outcome of a project is just the first step. It is equally important to monitor all risks on a scheduled basis by a risk management team, and reported on in the project status report.

## Purpose

Risk Management is the process of identifying and mitigating risks within a project. By controlling the level of project risk, we can:



Create more accurate forecasts

Be more confident of completing deliverables on time

Increase your changes of overall project success

Risk Management is comprised of the set of ***Process***, ***Role*** and ***Document*** for managing risks within the project

This plan documents the processes, tools and procedures that will be used to manage and control those events that could have a negative impact on the SMS Project. It’s the controlling document for managing and controlling all project risks. This plan will address :

* Risk Identification
* Risk Assessment
* Risk Mitigation
* Risk Contingency Planning
* Risk Tracking and Reporting

Appendix A will present a sample of the risk register, with a Risk Statement Form presented in Appendix B.

# Risk Management Strategy

## Process

The project manager working with the project team and project sponsors will ensure that risks are actively identified, analyzed, and managed throughout the life of the project. Risks will be identified as early as possible in the project so as to minimize their impact. The steps for accomplishing this are outlined in the following sections. The Project manager will serve as the Risk Manager for this project.

A risk is defined as any event that is likely to adversely affect the project’s ability to achieve the define objectives. To reduce the impact of risks identified for your project, you need to implement an effective Risk Management Process.

The first step in the Risk Management Process is the completion of a *Risk Register*. With this form anyone in the project team can document a new project risk by describing it in detail and rating likelihood and potential impact on the project. All *Risk Register* are submitted to the Project Manager, Who assesses each risk and determines, base on its likelihood and potential impact on the project. These require actions are then completed, and the risk is once again reviewed to determine whether it is still likely to occur

The following diagram depicts the process undertaken to monitor and control risks within the project



### Identify Risk

Any member of the project team may identify a new project risk. A *Risk Register* is complete to describe the risk and rate its likelihood and impact on the project should it occur. Preventative and contingent actions required to avoid, transfer or mitigate the risk are also identified

### Review Risk

The *Risk Register* is then forwarded to the Project Manager who investigates the risk and determines the overall risk priority. The risk priority is based on likelihood that the risk will occur and its level of impact on the project should it occur. Risks that are highly likely to occur and will have a serious impact on the project should they occur, are deemed high priority and forwarded to the Project Manager review

### Assign Risk Actions

The Project Manager reviews all high priority risks by considering their likelihood and potential impact on the project. It may then decide to:

* Ignore the risk, as Team members believe it is not likely to occur within the Project Lifecycle
* Validate the risk and request further information that is needed to make a decision
* Decide on a suite of actions to avoid, transfer or mitigate the risk



***Risk Management WBS***

## Risk Identification

A risk is any event that could prevent the project from progressing as planned, or from successful completion. Risks can be identified from a number of different sources. Others will be identified during the project lifecycle, and a risk can be identified by anyone associated with the project. Some risk will be inherent to the project itself, while others will be the result of external influences that are completely outside the control of the project team.

Throughout all phases of the project, a specific topic of discussion will be risk identification. The intent is to instruct the project team in the need for risk awareness, identification, documentation and communication. Risk awareness requires that every project team member be aware of what constitutes a risk to the project, and being sensitive to specific events or factors that could potentially impact the project in a positive or negative way.

Risk awareness requires that every project team member be aware of what constitutes a risk to the project, and being sensitive to specific events or factors that could potentially impact the project in a positive or negative way.

Risk identification consists of determining which risks are likely to affect the project and documenting the characteristics of each.

Risk communication involves bringing risk factors or events to the attention of the project manager and project team.

At any time during the project, any risk factors or events should be brought to the attention of the SMS project manager using Email, SVN or some other form of written communication to document the item. The project manager is responsible for logging the risk to the Risk Register. Notification of a new risk should include the following Risk Register elements :

* Description of the risk factor or event, e.g. conflicting project or operational initiatives that place demands on project resources, design errors or omissions, weather, construction delays, etc.
* Probability that the event will occur. For example, a 50% chance that the vendor will not have staff available to pour the cement.
* Schedule Impact. The number of hours, days, week, or months that a risk factor could impact the schedule. As an example, the fires which have resulted in level 3 restrictions are likely to delay installation of the shelter and generator for 2 weeks.
* Scope Impact. The impact the risk will have on the envisioned accomplishments of the project. Extreme weather conditions may result in a reduction in the number of tower sites that can be completed.
* Quality Impact. A risk event may result in a reduction in the quality of work or products that are developed. As an example, lack of funding caused by construction cost overruns may result in the purchase of only one cooling unit rather than the planned number of two
* Cost Impact. The impact the risk event, if it occurs is likely to have on the project budget.

### Categories

* Requirement
* Benefits
* Schedule
* Budget
* Deliverables
* Scope
* Issues
* Suppliers
* Acceptance
* Communication
* Resource

### List the Risks in SMS Project

|  |  |  |
| --- | --- | --- |
| **Risk Category** | **Risk Description** | **Type Risk ID** |
| Requirement | The requirements have been clearly specified | 1.1 |
| The requirements specified do not match the customer’s needs. | 1.2 |
| The requirements specified are not measurable | 1.3 |
| Schedule | The Schedule doesn’t provide enough time to complete the project | 2.1 |
| The schedule doesn’t list all the activities and task required | 2.2 |
| The schedule doesn’t provide accurate dependencies | 2.3 |
| The overall delivery timeframe is insufficient to produce all of the deliverable | 2.4 |
| Deliverables | The deliverables required by the project are not clearly defined | 3.1 |
| Clear quality criteria for each deliverables have not been defined | 3.2 |
| The deliverables produced doesn’t meet the quality criteria defined  . So requiring redesign and rework | 3.3 |
| Scope | The scope of the project is not clearly outlined | 4.1 |
| The project is not undertaken within the agreed-upon scope | 4.2 |
| Project changes negatively impact on the project | 4.3 |
| Issue | Project issues are not resolved within an appropriate timescale | 5.1 |
| Similar issues continually reappear throughout the project | 5.2 |
| Unresolved issues become new risks to the project | 5.3 |
| Acceptance | The criteria for accepting project deliverables aren’t clearly defined | 6.1 |
| Customers do not accept the final deliverables of the project | 6.2 |
| The acceptance process leaves the customer | 6.3 |
| Communication | Lack of controlled communication causes project issues | 7.1 |
| Key project stakeholders are “left in the dark” about progress | 7.2 |
| Resource | Member allocated to the project are not suitably skilled | 8.1 |
| Insufficient equipment is available to undertake the project | 8.2 |
| There is a shortage of member available when required (because missing member, …) | 8.3 |
|  |  |  |

## Risk Quantification

Each of these risks identifies has been quantification below as to its likelihood and its impact on the project should it occur

### Likelihood

The following table describes the scoring mechanism used to identify the *likelihood* of each project risk stated above

|  |  |  |
| --- | --- | --- |
| **Title** | **Score** | **Description** |
| Very Low | 20 | The risk is **highly unlikely** and will be recorded but not monitored |
| Low | 40 | The risk is **unlikely** but will be monitored throughout the project |
| Medium | 60 | The risk **likely** as it is clear that the risk may occur |
| High | 80 | The risk **very likely**, based on the circumstances of the project |
| Very high | 100 | The risk is **high likely**, as the circumstances that will cause this risk to occur are also very likely to occur |

### Impact

|  |  |  |
| --- | --- | --- |
| **Title** | **Score** | **Description** |
| Very Low | 20 | The risk will have an **insignificant impact** on the project |
| Low | 40 | The risk will have a **minor impact** on the project (< 5% deviation in scope, schedule end – date) |
| Medium | 60 | The risk will have a **measurable impact** on the project (5% - 10% deviation in scope, schedule end – date) |
| High | 80 | The risk will have a **significant impact** on the project (10% - 25% deviation in scope, schedule end – date) |
| Very high | 100 | The risk will have a **major impact** on the project (25% + deviation in scope, schedule end – date) |

### Priority

Now that you have identify the risks and created mechanisms for scoring their likelihood and impact, use the following table to assign the scores for each risk. The priority score is calculated as the average of the Likelihood and Impact (Ex. [Likelihood + Impact] / 2)

**Color – Code key**

|  |  |  |
| --- | --- | --- |
| **Priority** | | |
| **Score** | **Rating** | **Color** |
| 0 – 20 | Very low | White |
| 21 – 40 | Low | Green |
| 41 – 60 | Medium | Yellow |
| 61 – 80 | High | Orange |
| 81 – 100 | Very High | Red |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk ID** | **Likelihood Score** | **Impact Score** | **Priority Score** | **Priority Rating** |
| 1.1 | 40 | 80 | 60 |  |
| 1.2 | 20 | 40 | 30 |  |
| 1.3 | 90 | 40 | 70 |  |
| 2.1 | 80 | 80 | 80 |  |
| 2.2 | 20 | 80 | 50 |  |
| 2.3 | 80 | 60 | 70 |  |
| 2.4 | 80 | 50 | 65 |  |
| 3.1 | 50 | 80 | 65 |  |
| 3.2 | 50 | 80 | 65 |  |
| 3.3 | 40 | 80 | 60 |  |
| 4.1 | 20 | 80 | 50 |  |
| 4.2 | 10 | 80 | 45 |  |
| 4.3 | 20 | 80 | 50 |  |
| 5.1 | 50 | 60 | 55 |  |
| 5.2 | 20 | 60 | 40 |  |
| 5.3 | 50 | 70 | 60 |  |
| 6.1 | 20 | 80 | 50 |  |
| 6.2 | 10 | 100 | 55 |  |
| 6.3 | 10 | 100 | 55 |  |
| 7.1 | 50 | 80 | 65 |  |
| 7.2 | 50 | 80 | 65 |  |
| 8.1 | 80 | 80 | 80 |  |
| 8.2 | 50 | 60 | 55 |  |
| 8.3 | 80 | 80 | 80 |  |

## Risk Responsibilities

The responsibility for managing risk is shared amongst all the stakeholders of the project. However, decision authority for selecting whether to proceed with mitigation strategies and implement contingency actions, especially those that have an associated cost. The following tables details specific responsibilities for the different aspects of risk management.

|  |  |
| --- | --- |
| **Role** | **Responsibilities** |
| Team member | The Project Team is responsible for: |
| * Identifying risks within the project |
| * Completing a *Risk Register* for each risk identified |
| * Completing all risk actions assigned by the Project Manager |
| Project manager | The Project Manager is responsible for: |
| Reviewing all risks to determine their priority |
| Implementing risk actions for low/ medium priority risks |
| Reviewing risk after risk actions have been undertaken |
| Reviewing high priority risks before |
| Identifying actions required to avoid, transfer or mitigate high priority risks |

|  |  |
| --- | --- |
| **Risk Activity** | **Responsibility** |
| Risk Identification | All project stakeholders |
| Risk Registry | Project manager |
| Risk Assessment | All project stakeholders |
| Risk Statements | Project manager |
| Risk Response Options Identification | All project stakeholders |
| Risk Response Approval | Project manager |
| Risk Contingency Planning | Project manager |
| Risk Response Management | Team menmber – SonDang & HaiNguyen (tracking & monitor), Project Manager (Approval) |
| Risk Reporting | Team member – HuyenLe & TinNguyen (tracking & monitor), Project Mananger (Approval) |

## Risk Assessment

Risk assessment is the act of determining the probability that a risk will occur and the impact that event would have, should it occur. This is basically a “cause and effect” analysis. The “cause” is the event that might occur, while the “effect” is the potential impact to a project, should the event occur.

Risk assessment is the act of determining the probability that a risk will occur and the impact that event would have, should it occur. This is basically a “cause and effect” analysis. The “cause” is the event that might occur, while the “effect” is the potential impact to a project, should the event occur.

Assessment of a risk involves two factors. First is the probability which is the measure of certainty that an event, or risk, will occur. This can be measured in a number of ways, but for the SMS project will be assigned a probability percentage for 1% to 100%. A risk with no probability of occurring will obviously pose no threat, while a risk of 100% means the risk event has occurred and the priority of the risk will have on the project if the risk occurs **(the priority is rated as: 1=very low, 2=low, 3=moderate, 4=high, and 5=very high.)**

The second factor is estimate of the impact on the project. This can be a somewhat subjective assessment, but should be quantified whenever possible. The estimated cost, the duration of the potential delay, the changes in scope and the reduction in quality are in most cases factors that can be estimated and documented in the risk statement and then measured using the standard project management tools (i.e. project plan, budget, statements of work). Rather than detailed impact estimates the Risk Register contains three ratings for impact; High, Medium and Low. This makes it easier to compare one risk to another and assign priorities. For each of the impact categories the impact is assessed as follows:

* Cost – This impact is usually estimated as a dollar amount that has a direct impact to the project. However, cost is sometimes estimated and reported as simply additional resources, equipment, etc. This is true whenever these additional resources will not result in a direct financial impact to the project due to the fact the resources are loaned or volunteer, the equipment is currently idle and there is no cost of use, or there are other types of donations that won’t impact the project budget. Regardless of whether there is a direct cost, the additional resources should be documented in the risk statement as part of the mitigation cost.
* Scope – Whenever there is the potential that the final product will not be completed as originally envisioned there is a scope impact
* Schedule – It is very important to estimate the schedule impact of a risk event as this often results is the basis for elevating the other impact categories. Schedule delays frequently result in cost increases and may result in a reduction of scope or quality. Schedule delays may or may not impact the critical path of the project and an associated push out of the final end date.
* Quality – Quality is frequently overlooked as an impact category and too often a reduction in quality is the preferred choice for mitigation of a risk. “Short cuts” and “low cost replacements” are ways of reducing cost impacts. If not documented appropriately and approved by the project sponsor, mitigation strategies that rely upon a reduction in quality can result in significant disappointment by the stakeholders.

## Risk Response

For each identified risk, a response must be identified. It is the responsibility of the team project to select a risk response for each risk. The team project will need the best possible assessment of the risk and description of the response options in order to select the right response for each risk. The probability of the risk event occurring and the impacts will be the basis for determining the degree to which the actions to mitigate the risk should be taken. One way of evaluating mitigation strategies is to multiply the risk cost times the probability of occurrence. Mitigation strategies that cost less than risk probability calculation should be given serious consideration. The possible response options are:

* Avoidance – Change the project to avoid the risk. Change scope, objectives, etc.
* Transference – Shift the impact of a risk to a third party (like a subcontractor). It does not eliminate it, it simply shifts responsibility.
* Mitigation – Take steps to reduce the probability and/or impact of a risk. Taking early action, close monitoring, more testing, etc.
* Acceptance – Simply accept that this is a risk. The associated impact to the project that results, we are not going to take any actions and will accept the cost, schedule, scope, and quality impacts if the risk event occurs.
* Deferred – A determination of how to address this risk will be addressed at a later time.

The results of the risk assessment process are documented in each Risk Statement and summarized in the Risk Register which will be reported on a monthly basis.

## Risk Mitigation

Risk mitigation involves two steps:

* Identifying the various activities, or steps, to reduce the probability and/or impact of an adverse risk.
* Creation of a Contingency Plan to deal with the risk should it occur.

Taking early steps to reduce the probability of an adverse risk occurring may be more effective and less costly than repairing the damage after a risk has occurred. However, some risk mitigation options may simply be too costly in time or money to consider.

Mitigation activities should be documented in the Risk Register, and reviewed on a

regular basis. They include:

* Identification of potential failure points for each risk mitigation solution.
* For each failure point, document the event that would raise a “flag” indicating that the event or factor has occurred or reached a critical condition.
* For each failure point, provide alternatives for correcting the failure.

## Risk Contingency Planning

Contingency planning is the act of preparing a plan, or a series of activities, should an adverse risk occur. Having a contingency plan in place forces the project team to think in advance as to a course of action if a risk event takes place.

* Identify the contingency plan tasks (or steps) that can be performed to implement the mitigation strategy.
* Identify the necessary resources such as money, equipment and labor.
* Develop a contingency plan schedule. Since the date the plan will be implemented is unknown, this schedule will be in the format of day 1, day 2, day 3, etc., rather than containing specific start and end dates.
* Define emergency notification and escalation procedures, if appropriate.
* Develop contingency plan training materials, if appropriate.
* Review and update contingency plans if necessary.
* Publish the plan(s) and distribute the plan(s) to management and those directly involved in executing the plan(s).

## Tracking and Reporting

As project activities are conducted and completed, risk factors and events will be monitored to determine if in fact trigger events have occurred that would indicate the risk is now a reality.

Risk management is an ongoing activity that will continue throughout the life of the project. This process includes continued activities of risk identification, risk assessment, planning for newly identified risks, monitoring trigger conditions and contingency plans, and risk reporting on a regular basis. Project status reporting contains a section on risk management, where new risks are presented along with any status changes of existing risks. Some risk attributes, such as probability and impact, could change during the life

of a project and this should be reported as well.

## Appendix A - Simple Risk Register

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Register** | | | | | | | |
| Priority | Title | Description | Probability of Impact | Schedule | Scope | Quality | Cost |
| 1 | Financial problems |  | 95% | High | High | Medium | High |
| 2 | Requirements change |  | 80% | High | High | Low | High |
| 3 | Volunteer workforce | Availability of the right people at the right time, and the face that so many are volunteers | 75% | High | Medium | Medium | High |
| 4 |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |

## Appendix B - Simple Risk Statement Form

