RISK MANAGEMENT PLAN

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And
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1 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. For example, a cause may be requiring an environmental permit to do work, or having limited personnel assigned to design the project. The risk event is that the permitting agency may take longer than planned to issue a permit, or the assigned personnel available and assigned may not be adequate for the activity. If either of these uncertain events occurs, there may be an impact on the project cost, schedule or performance. All projects assume some element of risk, and it's through risk management where tools and techniques are applied to monitor and track those events that have the potential to impact the outcome of a project.

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. On the other hand, any event that could have a positive impact should be exploited.

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.

1.1 Purpose

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 Interoperability Montana (IM) 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.

2 Risk Management Strategy

2.1 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. Some may be quite obvious and will be identified prior to project kick-off. 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.

The Interoperability Montana Project Directors (IMPD) have overall responsibility for managing project risk. As the IM Project Manager, Mark Adams has been assigned by Northrop Grumman as the person responsible for administering risk management processes and activities for the IM project.

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 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.

The Northrop Grumman project manager will identify and document known risk factors during creation of the Risk Register.

It is the Northrop Grumman project manager's responsibility to assist the IMPD and other stakeholders with risk identification, and to document the known and potential risks in the Risk Register. Updates to the risk register will occur as risk factors change. Risk management will be a topic of discussion during the monthly project IMPD meeting.

The Northrop Grumman project team will discuss any new risk factors or events, and these will be reviewed with the Northrop Grumman project manager.

The project manager will determine if any of the newly identified risk factors or events warrant further evaluation. Those that do will undergo risk quantification and risk response development, as appropriate, and the action item will be closed.

At any time during the project, any risk factors or events should be brought to the attention of the Northrop Grumman project manager using Email 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.

2.2 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 or resource requirement rest with the IMPD. The following tables details specific responsibilities for the different aspects of risk management.

Risk Activity	Responsibility
Risk Identification	All project stakeholders
Risk Registry	Project Manager
Risk Assessment	All project stakeholders
Risk Statements	Project Manager(s), IMTC
Risk Response Options Identification	All project stakeholders
Risk Response Approval	IMTC (recommendation) IMPD (approval)
Risk Contingency Planning	Project Manager(s)
Risk Response Management	Project Managers
Risk Reporting	Project Manager

2.3 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.

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 IM 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.

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. Scope impact could be measured as a reduction of the number of tower sites, elimination of trunking for a site, or not providing a back-up power source.

- 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. As an example, a road wash-out for a tower site might delay completion of that site for 3 weeks, but if another site is scheduled to complete after delayed site, the 3 week delay won't impact 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.

Most risks will be assigned one category, but some might be assigned more than one, or all.

2.4 Risk Response

For each identified risk, a response must be identified. It is the responsibility of the IMPD to select a risk response for each risk. The IMPD 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. When choosing acceptance as a response the IMPD is stating that given the probability of occurring and the associated impact to the project that results, they 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.

2.5 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.

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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.

2.6   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).

Contingency may also be reflected in the project budget, as a line item to cover unexpected expenses. The amount to budget for contingency may be limited to just the high probability risks. This is normally determined by estimating the cost if a risk occurs, and multiplying it by the probability. For example, assume a risk is estimated to result in an additional cost of $50,000, and the probability of occurring is 80%. The amount that should be included in the budget for this one item is $40,000.

Associated with a contingency plan, are start triggers and stop triggers. A start trigger is an event that would activate the contingency plan, while a stop trigger is the criteria to resume normal operations. Both should be identified in the Risk Register.

2.7   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.

Based on trigger events that have been documented during the risk analysis and mitigation processes, the IMPD, or Northrop Grumman project managers will have the authority to enact contingency plans as deemed appropriate. Day to day risk mitigation activities will be enacted and directed by the project managers. Large scale mitigation strategies will be initiated by the IMPD.

Contingency plans that once approved and initiated will be added to the project work plan and be tracked and reported along with all of the other project activities.

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.

2.8   Processes to Address Immediate Unforeseen Risks

The individual identifying the risk will immediately notify the IMPD and Northrop Grumman project managers. The individual notified will assess the risk situation.

If required, the IMPD and Northrop Grumman project managers will identify a mitigating strategy, and assign resources as necessary.

The project risk manager will document the risk factor and the mitigating strategy.
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Appendix A - Sample Risk Register

Interoperability Montana - Risk Assessment

Priority	Title	Description	Probability of Impact	Schedule	Scope	Quality	Cost	Activity Since Last Report
1	Procurement Process	Land use agreements approved by DES Site users agreements NEPAs Pre-award letters.	100%	High	High	High	High	> We currently have no procurement vehicle due to an issue with MCA building code interpretation. This is halting improvements on all IM sites requiring upgrades. > The mitigation strategy for procurement is to move it to DoA.
2	Funding	If delays in procurement occur due to processes and procedures, funding may be lost.	95%	High	High	High	High	> There is not an accurate accounting of the available funding that encompasses all funding sources. > The IMPD and IMTC cannot make decisions about the scope and priorities of the project without an accurate understanding of the available funding. > To mitigate this problem, a spreadsheet has been developed and requests for financial information has been issued to each of the funding sources.
3	Frequency Acquisition	Effective, timely, and managed frequency acquisition.	90%	High	High	High	High	> The Frequency Subcommittee continues to struggle as a funding request for contracted resources has not been approved.
4	Incomplete Governance definition	Confusion among participants of roles and decision-making authority. - DES - PSSB - NG - DOT - MHP	85%	Medium	Medium	Low	Medium	> The Governance Committee continues to meet regularly. Progress is reported at the monthly IMPD. > Discussions have begun about how to complete the Interoperability Communications Plan which is required by Nov. 1, 2007 > There has not been an official designation of either an interim or permanent Executive Director for the project.
5	Volunteer Workforce	Availability of the right people at the right time, and the fact that so many are volunteers.	75%	High	Medium	Medium	High	> The Frequency Subcommittee continues to struggle as a funding request for contracted resources has not been approved. > The Backbone Design document is completed and being critiqued by the IMTC and others.

Appendix B - Sample Risk Statement Form

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RISK STATEMENT

| Risk ID: | 1 | Title: | Lead Times for Towers and Shelters | Status: | Monitor |

| Date Identified: | 3/2/2006 | Category | Schedule | Probability | High |

| Owner: | Adams | | | Schedule Impact | High |

Description: There is a six to eight week lead time on towers and shelters. This has the potential for causing delays and not meeting scheduled completion dates

Impacts

Project Milestones: For those sites where this is an issue, site completion milestones could be delayed, which could also delay the overall completion of the NTIP.

Schedule: If lead times are properly accounted for, any tasks or activities that are dependent on the installation of towers and shelters will be delayed. It is possible, that overall completion delays could be averted through proper planning and redeployment of resources to other tasks during the lead time.

Mitigation & Contingency Plans

Mitigation:
1. Identify those sites where this is a potential problem.
2. Plan accordingly, and proceed with ordering towers and shelters if there is minimum risk of doing so.
3. If delays occur, redeploy efforts to other sites.
4. For those sites that may be effected, have contingencies plans in place by knowing what other sites to assign resources to mitigate overall project completion slippages.
5. Explore opportunities for reducing lead times.

Estimated Mitigation Cost:

Contingency:
1. Reallocate installation resources to others sites that are in a position to proceed.
2. Execute tasks out of order if dependencies permit.

Start Trigger:
1. Delivery times extend beyond scheduled start dates for installation.
2. Delays in finalizing design specifications has extended beyond planned order dates.

Stop Trigger:
1. Schedules revised to reflect new delivery and installation dates.
2. Work is diverted to other sites to offset site delays.