WHAT IS THE PROJECT RISK MANAGEMENT PROGRAM?

Risk management is one of the primary knowledge areas of project management to be applied throughout the lifecycle of a project. The Project Risk Management program supports the Region Project team in managing project risks in project delivery. The Region is responsible for project management, and thus project risk management.

The following guide is intended to provide the fundamental aspects of project risk management and there is a companion tool associated with this guide. The companion tool, available at the Value Engineering, Project Risk Management, and Constructability Review website titled “Risk Register”, was designed to intuitively and effectively facilitate the project risk management process for Region project delivery. This tool is available for use by everyone, however regions can use whichever tools and processes that best fits the users and the project.

This document was created and is maintained by Zach Davis, VE/ Project Risk Engineer, and is a living document that is certain to change as the project management sub-discipline of project risk management evolves to best suit ODOT’s needs. Your input and feedback are welcome and appreciated.

For feedback, questions, or assistance please call 503-986-7168.
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1 INTRODUCTION

1.1 PURPOSE

ODOT Highway Directive DES 01-02 Managing Project Risks for ODOT STIP requires that all applicable STIP projects have a plan for managing scope, schedule, and budget risks of the project. Additionally, applicable STIP projects that exceed $25 million in estimated total project cost are required to conduct a quantitative risk analysis that produces a risk based schedule and cost estimate.

This guide is intended to provide fundamentals for, and a consistent method to, managing project risks.

1.2 WHAT IS PROJECT RISK?

The international standard ISO 31000 definition of risk is “the effect of uncertainty on objectives”. The PMI A Guide to the Project Management Body of Knowledge (PMBOK® Guide) Sixth Edition defines individual [project] risk as “an uncertain event or condition event that, if it occurs, has a positive or negative effect on one or more project objectives”.

Risks are commonly thought of as negative or harmful. While they certainly can be, risks can also be positive or beneficial to a project. RSMeans Risk Management for Design and Construction states that “something this is properly defined as risky does not necessarily mean that it is a bad thing, only that it is an uncertain thing.”

Transportation infrastructure project management is a complex environment of inherent uncertainty. Risk management recognizes that in a complex environment, achievement of organizational goals depends on managing many internal and external risks. If risks and uncertainty are inevitable, failing to consider them is irresponsible. A proactive project risk management approach effectively identifies, addresses, and mitigates threat risk events before they develop into negative outcomes, and identifies, addresses, and enhances opportunity risk events into positive outcomes.

1.3 WHY PROJECT RISK MANAGEMENT?

Managing Project risk includes a process of planning the risk management process, identifying project risk, performing risk analysis, evaluating and prioritizing risk, determining risk response strategy, implementing risk response, and monitoring and reviewing risk. Transparent and effective management of risks is an integral component of project management, shifting the odds of discovery and uncertainty in favor of desired outcomes.

Managing project risks, and documenting the process, provides the following benefits to a project:

- Can significantly reduce avoidable change, as defined by the Project Change Management Request Process, to ODOT projects.
• Provides justification to support an elective (opportunity risk) or unanticipated (threat or opportunity risk) change, as defined by the Project Change Management Request Process, during project development in requesting a STIP amendment or procurement amendment.

• Can significantly reduce the probability of contract change orders or contractor claims, due to avoidable change, during the construction phase of the project.

• Provides justification to support an Increase in Construction Authorization due to unanticipated change during the construction phase of the project.

• Demonstrates a well-managed project and builds credibility.

• Improves risk appetite and allows for strategic risk taking behavior.

• Recognizes uncertainty and provides objective forecasts of possible outcomes.

• Produces better business outcomes through more informed decision making.

• Has a positive influence on creative thinking and innovation.

• Creates opportunities for improved project monitoring and control.

• Contributes to project success.

• Allows for ODOT to identify and manage Project related enterprise risks (risks which occur regularly on projects)

Implementing a formal process provides a consistent framework to enable the ability to capture lessons learned and share information, as well as developing a repository of information that will remain beyond the project’s lifecycle.

1.4 GUIDING PRINCIPLES FOR ODOT PROJECT RISK MANAGEMENT

• The Transportation Project Manager (TPM)/ Resident Engineer-Consultant Projects (RE-CP) is responsible for generating the plan for managing risk, the project risk register, and reviewing it with the team and stakeholders.

• Project team members are responsible for documenting and communicating new risks as they are identified.

• Work and communicate progress on the most severe project risks first.

• Set realistic due dates and then work to meet the dates.

• Execute project risk response actions at the appropriate level (i.e., project, team, sub-team).

• Keep stakeholders informed on current project risk status, as appropriate.

• Document the planned project risk response history and actual outcomes. This documentation serves as a key input to root cause analysis, key learning, metrics, and risk analysis.
2  PROJECT RISK MANAGEMENT ORGANIZATION

2.1  PROCESS RESPONSIBILITY

The TPM/RE-CP is responsible for the plan for managing risks and its effective implementation throughout the project development phase. The TPM/RE-CP is also responsible for creating and maintaining the project risk register, unless this task is delegated to a team member. The Area Manager has the authority to appoint the responsibility of the project risk management process at their discretion.

If the construction administration is to be performed by a consultant, then the RE-CP is responsible for project risk management activities during the construction phase.

2.1.1  PROJECT TEAM

The TPM/RE-CP has overall responsibility for facilitating the process. Specific responsibilities for the TPM/RE-CP and project team members may include the following activities:

- Develop and implement the Risk Response Plan.
- Maintain the Plan throughout the project development process.
- Clarify, consolidate and document project risks.
- Maintain and monitor data in the project risk register.
- Monitor the status of risk responses.
- Communicate status to risk owners.
- Escalate communication if expected response action deadlines are not met.

Project team members are, at minimum, specifically responsible for:

- Participating in project risk assessment workshops/meetings.
- Performing the duties of risk owner, as assigned.
- Be proactive in their risk management efforts for projects.
- Report newly identified project risks to the assigned focal point for managing project risks.

2.1.2  RISK OWNER

The risk owner is the individual that the project team assigns responsibility for executing the risk response action. This assignment is based on the type of risk and should be assigned to the team member who is empowered to assure this risk is responded to. This will typically be a discipline lead and/or their respective co-lead. The risk owner has the following responsibilities:

- Assess the risk and create a risk response plan that meets project team approval.
- Perform risk response actions per the risk response plan.
• Present risk status at meetings, as required

2.1.3 Construction Resident Engineer
During the project construction phase, the Construction Resident Engineer (RE) is responsible for the plan for managing risks and its effective implementation. Many risk events are triggered during the construction phase of the project, therefore the RE should be involved in the design phase of the project and be an active participant in project meetings. Specific responsibilities of the RE include:

• Responsible for managing project risks during the construction phase.
• Manage projects in order to reduce risks and control project budget and schedule.
• Pursue risk response actions as identified in the Plan for managing risks for their projects.
• Participate in risk assessment workshops/risk management meetings for projects in the design phase.
• Perform the duties of risk owner, if assigned.
• Be proactive in their risk management efforts for projects.

2.1.4 Area Manager
The Area Manager has overall responsibility for ensuring that project teams comply with Highway Directive DES 01-02. Specific responsibilities include the following activities.

• Ultimately responsible for assigning risk owners.
• Approve the risk response action of very high severity level risks.
• Support risk response action implementation.
• Assist in cross-organization and controversial risk response action, including determining the involvement of senior management and other organizational resources.
• Appointing others to the focal point role of managing risks for the project at their discretion.
3 PROJECT RISK MANAGEMENT PROCESS

Project Risk management involves seven major phases: risk management planning, identify risk, perform risk analysis, evaluate and prioritize risk, plan risk response, implement risk response, and risk monitoring and control. Once the risk management planning has been completed, each risk should undergo the following process:

Figure 1: Project Risk Management Process

Identify Risk
- Identify risks which may affect project outcomes

Analyze Risk
- Determine how they might affect project objectives

Prioritize Risk
- Effectively allocate Risk Response resources

Plan Risk Response
- Project team selects response actions for each risk

Implement Response
- Implementing agreed upon risk response plans

Monitor Review & Update
- Monitor, review and update plan for managing risk

The following sections provide details on each step of the process.
3.1 PLAN RISK MANAGEMENT

The systematic process of deciding how to approach, plan, and execute around the management of scope, schedule, and budget risk-related activities throughout the life of a project. It is intended to maximize the beneficial outcome of the opportunities and minimize or eliminate the consequences of threat risks.

Pursuant to DES 01-02, all applicable STIP projects are required to have a plan for managing scope, schedule, and budget risks.

Specific objectives of the Plan include:

- Ensuring critical risks impacting scope, schedule, budget, project performance, and change management are proactively identified, communicated, responded to, and escalated in a timely manner.

- Focusing attention to key risks impacting the project and individual teams.

- Producing documentation that allows project management to focus efforts on the “right” (e.g., high likelihood and high impact) risks with an effective coordination of effort.

- Ensuring appropriate stakeholders are informed and, if applicable, participate in the mitigation.

- Documenting discussions and response action of project risks throughout the project life cycle.

The Plan consists of the process and timing for identifying and managing risks, response actions required and organizational responsibility for monitoring and managing the risks throughout the entire lifecycle.

3.2 IDENTIFY RISKS

Identify risks that may affect project objectives and documenting them in the Project Risk Register, which includes the following:

- Date the risk was initially identified

- Identification of risk nature (threat or opportunity)

- A specific description of each potential risk event that clearly discusses how the risk could affect the scope, schedule, and/or budget of the project. Include a description of possible risk triggers (what causes the risk to occur)

- General category of the risk (e.g. Right-Of-Way risk)

- Risk status (active, dormant, or retired)
A risk that is identified as a threat means that it will likely result, if the risks occurs, in a cost increase and schedule delay. Conversely, a risk identified as an opportunity means that it will likely result, if the risk occurs, in a cost savings and schedule gain.

For risk status, a risk that is dormant is of such low priority that it doesn’t warrant resources for risk response. A retired risk has been either completely avoided (threats) or exploited (opportunities). If a risk has been accepted as a response strategy, it should remain as an active risk until the risk trigger event has been surpassed by the project.

It is helpful to use a consistent format when describing risks so they are clearly and unambiguously understood. The project risk management program recommends writing risk statements using an “if-then” format. The following is a general risk statement example using the “if-then” format:

“If differing site conditions occur on the project, then our cost can increase causing the project to go over budget”

When describing risk and writing risk statements, it is important to be as specific as possible. The above example risk statement would apply to almost every project ODOT delivers, so how useful is it? The detailed description of the identified risk must provide information that is specific, measurable, attributable and relevant. Do not hesitate to rely on engineering judgement from the design team, who are the projects “risk experts”. The following is an example of risk description including these characteristics:

“Historical subsurface information in the vicinity of the drilled shafts of bent 6 indicate a boulder field may be present. **If** the drilled shaft contractor encounters boulders in soil that otherwise appears granular, **then** the contractor may file a differing site conditions claim that may result in cost increases of $250k to $500k and a schedule delay of 2 to 6 months”

Identifying project risks should be performed in a workshop setting with members of the project team, at a minimum, with the TPM/RE-CP facilitating the process. Ideally, all internal and external parties that may have relevant input in identifying project risks would be included in this step of the process.

Risk identification is ongoing throughout project development. As projects evolve, the risk profile changes and project understanding grows. Previously identified risks may change and new risks may emerge.

Here are a few tips for risk identification:

- Focus on identifying large significant risks that affect project objectives.
- Carefully document and describe risks. Be as specific as possible.
- Be mindful of possible biases during the risk identification process.
3.3 PERFORM RISK ANALYSIS

After risks are identified, the risks are analyzed by subject matter experts (primarily the project team) to determine how they could affect the project. Risks can impact a project in several basic ways:

- The objectives are reduced or delayed,
- The schedule is extended or accelerated,
- The costs are increased or decreased, and
- The quality is reduced or enhanced.

The primary intent for analyzing the risks is to prioritize risks so that resources can be properly allocated for risk response.

3.3.1 QUALITATIVE RISK ANALYSIS

A Qualitative analysis of a risk's probability of occurrence and, if the risk were to occur, an analysis of cost and schedule impact on a project to categorize a risk as low, medium, or high. The following is an example of qualitative risk analysis:

**Risk description:** The design team anticipates approximately 1000 CY of contaminated soil. **If** the contractor encounters more contaminated soil than anticipated, **then** the project costs will increase and the schedule may be delayed.

**Risk analysis:** low probability of occurrence, high cost impact, moderate schedule impact.

The project risk management program has developed a risk register tool that includes a scalable project risk rating table to facilitate the qualitative analysis of risk. This tool uses a range of cost and schedule impacts assigned to a number to categorize the qualitative impact. Below is an example of the risk rating table in this tool:
Table I: Project Risk Register Tool Risk Rating Table

<table>
<thead>
<tr>
<th>Value</th>
<th>Prob. Of Occurrence</th>
<th>Schedule Impact</th>
<th>Cost Impact</th>
<th>Qualitative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;10%</td>
<td>0 - 18 Days</td>
<td>0 - $50 K</td>
<td>Negligible</td>
</tr>
<tr>
<td>2</td>
<td>10-20%</td>
<td>18 Days - 36 Days</td>
<td>$50 K - $100 K</td>
<td>Very Low</td>
</tr>
<tr>
<td>3</td>
<td>20-30%</td>
<td>36 Days - 3 Mths</td>
<td>$100 K - $250 K</td>
<td>Low</td>
</tr>
<tr>
<td>4</td>
<td>30-40%</td>
<td>3 Mths - 4.2 Mths</td>
<td>$250 K - $350 K</td>
<td>Moderately Low</td>
</tr>
<tr>
<td>5</td>
<td>40-50%</td>
<td>4.2 Mths - 6 Mths</td>
<td>$350 K - $500 K</td>
<td>Moderate</td>
</tr>
<tr>
<td>6</td>
<td>50-60%</td>
<td>6 Mths - 7.8 Mths</td>
<td>$500 K - $650 K</td>
<td>Moderately High</td>
</tr>
<tr>
<td>7</td>
<td>60-70%</td>
<td>7.8 Mths - 9 Mths</td>
<td>$650 K - $750 K</td>
<td>High</td>
</tr>
<tr>
<td>8</td>
<td>70-80%</td>
<td>9 Mths - 10.2 Mths</td>
<td>$750 K - $850 K</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>80-90%</td>
<td>10.2 Mths - 12 Mths</td>
<td>$850 K - $1.0 M</td>
<td>Very High</td>
</tr>
<tr>
<td>10</td>
<td>&gt;90%</td>
<td>&gt; 12 Mths</td>
<td>&gt;$1.0 M</td>
<td>Extremely High</td>
</tr>
</tbody>
</table>

The values of this table can be modified to scale the risk analysis to the project size. The following is an example of qualitative risk analysis using the risk rating table in this risk register tool.

**Risk description:** The design team anticipates approximately 1000 CY of contaminated soil. If the contractor encounters more contaminated soil than anticipated, then the project costs will increase and the schedule may be delayed.

**Risk analysis:** probability of occurrence of 2 (Low, 10-20%), cost impact of 7 (high, approximately $650-k-$750k), schedule impact of 5 (moderate, approximately 4.2-6 months).

If the tool developed by the Project Risk Management program is used, the analysis looks like the following figure:
During qualitative risk analysis, the accuracy of the cost and schedule impacts is not critically important. The intent is to be reasonably accurate, but not unproductive. For most risks, rating for each risk should be completed within 5 minutes.

### 3.3.2 QUANTITATIVE RISK ANALYSIS

An analysis of a risks probability of occurrence and, if the risk were to occur, an analysis of a risk’s realistic range of cost and schedule impact through engineering judgement. The following is an example of quantitative risk analysis:

**Risk description**: The design team anticipates approximately 1000 CY of contaminated soil. If the contractor encounters more contaminated soil than anticipated, then the project costs will increase and the schedule may be delayed.

**Risk analysis**: 15% probability of occurrence, cost impact range $500K to $800K, schedule impact range 3 to 6 months.

Quantified risks are used to conduct a Cost Risk Assessment; which is a process to evaluate quality and completeness of the project cost and schedule estimate, to identify, assess,
quantitatively analyze project risks, and produce a probabilistic risk-based project cost and schedule estimate for the project.

Pursuant to DES 01-02, applicable STIP projects that exceed $25 million in estimated total project cost are required to conduct a quantitative risk analysis that produces a risk based schedule and cost estimate. Furthermore, a quantitative risk analysis is encouraged for projects that are less than $25 million and have complex elements. As agreed upon by the TPM/RE-CP, The Project Risk Management program can help coordinate or facilitate all aspects of a quantitative risk analysis, including assembling subject matter experts, coordinating project base estimate validation, facilitating the quantitative risk analysis, compiling the report, and tracking the quantitative risk analysis results.

### 3.4 Evaluate and Prioritize Risk

The process of prioritizing risks so response resources can be efficiently allocated. In this step the project teams evaluates the results of the risk analysis and rank the risks according to the projects priorities. The intent of this is to provide guidance on how to allocate the limited resources for risk response. The aforementioned project risk register tool developed by the Project Risk Management program produces a “risk score” based on the risk analysis of the project team. The risk score can be found directly next to the heat map as shown in the following figure:

![Project Risk Register tool](image)

**Figure I: Project Risk Register tool**

<table>
<thead>
<tr>
<th>Probability of Occurrence</th>
<th>Cost $ Impact</th>
<th>Schedule Impact</th>
<th>Heat Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating 2</td>
<td>7</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10-20%</td>
<td>$650K - $750K</td>
<td>4.2 Mths - 6 Mths</td>
<td></td>
</tr>
<tr>
<td>Very Low Prob.</td>
<td>High $ Impact</td>
<td>Mod. $ Impact</td>
<td></td>
</tr>
</tbody>
</table>
The risk score in this tool is a simple multiplication of the risk rating values. Threat risks will have positive risk scores. Opportunity risks will have negative risks scores. This can be used to differentiate the magnitudes of the each risk, thus providing a basis for ranking.

However, this tool does not have the capacity to capture risk impact beyond cost and schedule in its risk score (e.g. political risk). Risks that are identified that have an impact beyond cost and schedule should be reviewed with the Area Manager or appropriate stakeholder to determine how it should be prioritized.

3.5 PLAN RISK RESPONSE

The project team identifies a risk response strategy that is best for each risk, and then select specific actions to implement that strategy. Risk response actions are identified and assigned to parties that take responsibility for the risk response. This process ensures each risk requiring a response has an “owner”.

There are several basic risk response strategies. For threats the project team can: mitigate, avoid, transfer, or accept. For opportunities the project team can: enhance, exploit, share, or accept.

3.5.1 THREAT RISK RESPONSE ACTIONS

Avoid

Risk avoidance is when the project team acts to eliminate the threat or protect the project from its impact (reducing the probability of occurrence of a risk to 0%). [Risk avoidance] may be appropriate for high-priority threats with a high probability of occurrence and a large negative impact. *(PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition)*.

There are two types of avoidance action: (1) remove the cause of the risk (risk trigger), or (2) execute the project in a different way while still aiming to achieve project objectives. Not all risks can be avoided or eliminated, and for others this approach may be too expensive or time-consuming, but this should be the first strategy considered for each risk and should be the primary strategy for high probability/high impact risks *(Effective Opportunity Management for Projects by David Hillson)*.

Avoidance action should be taken on risks that have a high probability of occurrence and a high impact on project objectives.

Transfer

Transfer involves shifting ownership of a threat to a third part to manage the risk and to bear the impact if the threat occurs. Risk transfer often involves payment of risk premium to the party taking on the threat. Transfer can be achieved by a range of actions, which include but are not limited to the use of insurance, performance bonds, warranties, guarantees, etc. Agreements
may be used to transfer ownership and liability for specified risks to another party. (*PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition*)

**Mitigate**

Take action to lessen impact or probability of occurrence of a risk event (National Highway Institute)

In risk mitigation, action is taken to reduce the probability of occurrence and/or impact of the threat. (*PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition*)

This is the most common risk response strategy.

**Accept**

Risk acceptance acknowledges the existence of a threat, but no proactive action is taken. This strategy may be appropriate for low-priority threats, and it may also be adopted where it is not possible or cost-effective to address a threat in any other way. Acceptance can be either active or passive. The most common active acceptance strategy is to establish a contingency reserve, including amounts of time, money, or resources to handle the threat if it occurs. Passive acceptance involves no proactive action apart from periodic review of the threat to ensure that it does not change significantly. (*PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition*)

Risks that are uncontrollable (no response actions are practical) are also accepted (*Effective Opportunity Management for Projects by David Hillson*).

This is a common risk stagey for risks that have a low probability of occurrence. However, risks that have a very low to low probability of impact and very high to extreme impact on project objectives (known as a black swan event) that have been accepted as a risk response strategy should be very closely monitored as they can have devastating consequences to a project.

**3.5.2 Opportunity Risk Response Actions**

**Exploit**

The exploit strategy may be selected for the high-priority opportunities where the organization wants to ensure that the opportunity is realized. This strategy seeks to capture the benefit associated with a particular opportunity by ensuring that it definitely happens, increasing the probability of occurrence to 100%. Examples of exploiting responses may include assigning an organization’s most talented resources to the project to reduce the time to completion, or using new technologies or technology upgrades to reduce cost and duration. (*PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition*)

Opportunity risks that have high positive impact on project objectives (known as golden opportunities) should be exploited.

**Share**
Sharing involves transferring ownership of an opportunity to a third party so that it shares some of the benefit if the opportunity occurs. It is important to select the new owner of a shared opportunity carefully so they are best able to capture the opportunity for the benefit of the project. Risk sharing often involves payment of a risk premium to the party taking on the opportunity. Examples of sharing actions include forming risk-sharing partnerships, teams, special-purpose companies, or joint ventures. (PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition)

Allocating risk ownership for an opportunity to another party who is best able to handle it, in terms of maximizing probability of occurrence and increasing potential benefits if it does occur. Transferring threats and sharing opportunities are similar in that a third party is used; those to whom threats are transferred take on the liability and those to whom opportunities are allocated should also be allowed to share in the potential benefits. (Effective Opportunity Management for Projects by David Hillson).

**Enhance**

The enhance strategy is used to increase the probability and/or impact of an opportunity. Early enhancement action is more often more effective than trying to improve the benefit after the opportunity has occurred. The probability of occurrence of an opportunity may be increased by focusing attention on its causes. Where it is not possible to increase probability, an enhancement response might increase the impact by targeting factors that drive the size of the potential benefit. (PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition)

This response aims to modify the “size” of the positive risk. We enhance the opportunity by increasing the probability and/or impact of an opportunity thereby maximizing benefits realized for the project. If the probability can be increase to 100% this is effectively an exploit response (Effective Opportunity Management for Projects by David Hillson).

**Accept**

Accepting an opportunity acknowledges its existence but no proactive action is taken. This strategy may be appropriate for low-priority opportunities, and it may also be adopted where it is not possible or cost-effective to address an opportunity in any other way. (PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition)

### 3.5.3 Risk Escalation Procedures

Most risk related decisions are made at the project team lead level. The Project Team may escalate risks that significantly impact the project’s scope, budget, schedule, change management, technical performance, and business performance objectives. Additionally, the Project Team may escalates risks determined to need cross-organization involvement, are controversial, or require senior management involvement and/or decisions.

Escalation is also appropriate when the project team or project sponsor agrees that a threat or opportunity is outside the scope of the project or that the proposed response would exceed the TPM/RE-CP’s authority. Escalated risks are managed at the program level, enterprise level, or other relevant part of the organization, and not on the project level. It is important that ownership of escalated risks are accepted by the relevant party in the organization. Risks are usually
escalated to the level that matches the objectives that would be affected if the risk occurred. (PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition)

3.6 IMPLEMENT RISK RESPONSE

Implement Risk Response is the process of implementing agreed-upon risk response plans. The key benefit of this process is that it ensures that agreed-upon risk responses are executed as planned in order to address overall project risk exposure, minimize individual project threats, and maximize individual opportunities. This process is performed throughout the project. (PMI A Guide to the Project Management Body of Knowledge [PMBOK® Guide] Sixth Edition)

Those assigned, risk owners and those designated to support risk response action, to a particular risk must take action to respond to the identified risks. Focusing on risks of most significance can shift the odds in favor of project success. The proposed risk response plan for each risk event should be included in the Plan and be clearly described to provide a clear course of action.

3.7 RISK MONITORING AND REVIEW

The process of monitoring previously identified risks, and reevaluating existing risks to verify the planned risk response strategies for their effectiveness. After risk response actions have been implement, the project team must track and record risk response effectiveness and any changes to the project risk profile.

Activities involved in Risk Monitoring include:

- Establishing periodic reviews (example: project milestones) and scheduling Risk Monitoring in the project plan.
- Ensuring that all requirements of the Plan are being implemented.
- Assessing currently defined risks as defined in the Plan.
- Evaluating effectiveness of actions taken.
- Identifying status of actions to be taken.
- Validating previous risk assessments (probability of occurrence and impact).
- Validating previous assumptions and state any new assumptions.
- Identifying new risks.
- Tracking risk response.
• Communicating risk management status and risk response action to the Area Manager and project sponsors, as appropriate.

Activities involved in Risk Review include:

• Validating risk response strategies and alternatives.
• Re-analyzing the risk after completing risk response action to determine the residual risk.
• Taking corrective action when actual events occur.
• Assessing impact on the project of actions taken (scope, cost, time, and resources).
• Identifying new risks resulting from risk mitigation actions.
• Ensuring the Plan is maintained and updated, at a minimum, at the completion of the following milestones: DAP, Preliminary Plans, Advance Plans, Final Plans, and PS&E.
• Ensuring change control addresses risks associated with the proposed change (e.g., CMR or Contract Change Order).
• Revising risk management documents to capture results of mitigation actions.
• Communicating risk management status and risk response follow-through to the area manager and project sponsors, as appropriate.

3.8 PROJECT RISK MANAGEMENT IMPLEMENTATION THROUGH PROJECT DEVELOPMENT

Project scoping teams are required to generate a project risk register that includes the following:

• A project risk register that identifies and describes risks.
• Qualitative risk assessment to allow for prioritization and risk scoring.
• Scoping assumptions regarding each risk event.

During the initiation phase of the project, the project team meets to generate the plan for managing project risks, including the project risk register. It is critically important that this process be conducted with the project team as they are project’s primary risk experts and the project will benefit from their collective knowledge. For most projects, the initial risk assessment for a project is a 2-4 hour meeting. Generating the plan for managing project risks should be completed early in the initiation phase of the project and include the following:

• A project risk register that identifies and describes risks;
• Qualitative risk analysis of scope, schedule, and budget risks to allow for prioritization;
• Response strategy plan that includes a risk owner and a detailed description of actions to be taken; and

• Risk monitoring and review log.

As the project evolves through project development, the risk profile changes and project understanding grows. Previously identified may change and new risks may emerge. To document the projects development, an update to the Plan, while retaining a copy of the previous Plan version, should be produced when a significant risk retires or is triggered, or at the completion of the following Project Phases: DAP, Preliminary Plans, Advance Plans, Final Plans, and PS&E.

Updates of the Plan may be included in a standard milestone comment review meeting, where project risks are commonly discussed. For example, the Design Acceptance Phase (DAP) Plan will likely have more active risks than the final plans Plan, but the DAP version of the Plan should still exist so it can be reviewed, if necessary. Updating the plan for managing risks will include:

• Versioning of the Plan for project documentation;

• Reevaluating each risk status;

• Rerating risks to track the reduction or gain in risk score;

• Updating the risk monitoring and review section with a narrative describing risk response actions taken including risk retirement;

• Risk elicitation to determine if new risks have occurred through the course of project development;

• If new risks have emerged, qualitative risk analysis of new scope, schedule, and budget risks to allow for prioritization, and;

• Response strategy plan for new risks that includes a risk owner and a detailed description of actions to be taken.

To gather valuable project risk data, including identifying Agency enterprise risk, the Plan will be submitted, along with other required submittal documents, at the completion of the following phase gates: Project Initiation, DAP, and PS&E.

Pursuant to DES 01-02, project risk management implementation through project development can be seen in figure III: Project Risk Management Activities at Project Milestones on Page 20.

3.9 CONSTRUCTION TRANSITION MEETING

During the construction management transition phase of the project lifecycle a construction hand-off meeting will be held specifically for review the project risk register with the project
construction administration leadership. This meeting includes, at a minimum, the following activities:

- Reviewing of the entire Plan with construction administration leadership, specifically highlighting active and high severity risks.
- Diligent reviewing of risks that have been accepted as a response strategy.
- Discussion of how the risks evolved during project development.
- Identifying, analyzing, and developing any new risks that have arisen since the PS&E phase.
- Documenting the dialogue/exchange.
Activities at Project Milestones

Project Risk Management