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1.0 Introduction

Risks need to be considered throughout the life of a project to better manage and control uncertainty implicit in every project. Risk assessments start in the planning stages continuing through final design and construction. The risk assessment process will be integrated into the project delivery schedule to establish and implement procedures that effectively reduce negative impacts while optimizing opportunities on a project.

This Risk Assessment Manual is an important tool for program managers to aid in ensuring that program or project risks are considered and proper decisions made to effectively manage the identified risks. This document outlines the risk assessment process and provides a consistent approach to risk, allowing the Port of Long Beach to address the assessment and management of project risks proactively and consistently throughout a project.

1.1 Objective

The Program Manager has ownership for processes through the entire project lifecycle, providing project and program oversight and coordination. Program Managers interface with many divisions throughout the Port as they successfully deliver a program and project. The risk assessment process is a tool to help program managers and project teams make informed decisions regarding alternative approaches to achieving project objectives and the relative risk involved in each. Integrating risk on a project can sometimes increase the likelihood of success in meeting or exceeding the most important objectives (e.g. time), but at the expense of other objectives (e.g. cost). Program/project risk assessments help to identify these trade-offs and encourage the project team to take appropriate measures to:

- Avoid and/or minimize adverse impacts to project scope, cost, safety and schedule.
- Maximize opportunities to improve the project’s objectives with lower cost, shorter schedules, enhanced scope and higher quality.
- Determine appropriate level of budget contingency.

In addition, the collaborative nature of the risk assessment process is intended to:

- Provide a forum for proactive – not reactive – project management.
- Develop a culture of mutual problem-solving.
- Reinforce lessons learned from past experience.
1.2 Definitions

Risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one project objective. A risk may have one or more causes and, if it occurs, one or more impacts.

Risk assessment is the systematic process of planning for, identifying, analyzing, responding to, mitigating, and monitoring project risks. It involves processes, tools and techniques that help the Program Manager maximize the probability and results of positive events and minimize the probability and consequences of adverse events. Project risk assessments are most effective when performed early in the life of the project and throughout the project’s life cycle. It is not a one-time event.

Risk planning is the initial phase in the overall risk assessment process.

Risk assessment team is the identified members that serve as a team member during the formal risk assessment workshop.

Risk workshop is the formal workshop with the risk assessment team to identify and analyze specific risks related to a project. This may include an initial and follow-up workshop(s).

Risk management is the overall process of identifying, assessing, and mitigating risks in a project or organization. Risks associated with project risk assessments must not be confused with insurance, liability or injury, which are managed by the Port’s Risk Management Division, although project risks may affect any of these elements.

Risk assessment plan is composed of the risk register and related risk treatment plans.

Risk owner is the person/organization responsible for managing and tracking the risk mitigation through implementation.

Risk register is an Excel spreadsheet which represents the identification and analysis of individual risks on a project.

Risk treatment plan is a plan of action to manage, mitigate, and track the identified risks.

Supplemental risk treatment plan is a management tool used on some risks already identified in the risk register to provide further detailed development of the specific mitigation plan.

Risk database is an on-going list of common risks identified on Port of Long Beach projects to be used during each risk assessment. The risk database is also to be updated with each project.

Risk watch list includes the risks that have been identified as low and medium risk on the risk register that needs to be reviewed throughout the length of the project and updated as necessary.

Stakeholder is identified as the people or organizations that have an interest or impact on the program or project inputs and outcomes.
2.0 Risk and Program Management

2.1 Overview

In general, risk assessments should be completed at all project phases, including Master Planning, Project Initiation, Feasibility/Pre-Design, Design, and Construction Management. Each phase should consist of a complete risk assessment or update, including risk identification, analysis, mitigation and management. The effort needed for the risk assessment may be more or less based on the risks and complexity of the project. The figure below represents a high level graphical overview of the overall project delivery process and the risk assessment process.

Figure 1: Overview of Project Delivery and Risk Assessment
As depicted in the preceding figure, initial risk assessment should ideally be performed from the Master Planning phase. However, projects that began before the risk assessment procedures were put in place can implement the initial risk assessment planning at the next appropriate opportunity, such as early in the next project phase. As the project progresses into each phase, the risk management plan is discussed and updated at the beginning of that phase and then updated throughout the phase. This document will be integrated with the Port of Long Beach’s Project Delivery Manual (PDM) and become a formal part of the overall process. The following provides more general information about the benefit and purpose of project risk assessment in each of the project delivery phases.

**Design-Master Planning** – Project risk assessment and management aids in the decision-making process in a programmatic fashion. Completing preliminary risk identification during this phase helps formulate approaches or determine the level of effort required for a program or project.

**Project Initiation** – Project risk assessment and management is a critical element in developing the project scope, determining budgetary and schedule impacts, and determining the project complexity.

**Project Feasibility/Pre-Design** – Project risk assessment and management aids in reducing the potential risks during the concept phase, thereby reducing future design and construction impacts to the project. Another use is to aid in the decision-making process for selecting one alternative over another. The environmental phase, conducted during the feasibility phase, can also benefit from a formal risk assessment plan.

**Design** – This phase will benefit from the risk assessment and management process by aiding the design team to help manage the project risks as identified, thereby mitigating the potential risks that will occur during design and the subsequent construction phases and improve the overall quality of the project. The Risk Assessment Plan can function as a tool for the Risk Management Division during their determination of the level of insurance requirements.

**Construction** – The risk assessment and management process continues through construction and commissioning as a tool for the Construction Manager and Program Manager. The benefits of continuing the risk assessment and management process through construction is that new information and data can be discovered at this phase. The Construction Management Team (construction manager, contractors, inspectors) provide a different perspective on risks and can help to identify other risks, not identified in the previous project phases. If completed at the very beginning of the construction contract, this can help to reduce and/or eliminate risks impacting project schedule and budget.
2.2 Risk Assessment Guidelines

All projects are required to have a risk assessment plan however, the level of detail may vary from project to project. In order to account for different project needs, the table below outlines risk assessment guidelines based on different project cost.

<table>
<thead>
<tr>
<th>Project Size</th>
<th>Risk Assessment Process</th>
<th>Roles &amp; Responsibilities Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: &lt;$5M</td>
<td>Complete Risk Register</td>
<td>Project Manager populates, monitors, and updates risk register, with assistance from Risk Coordinator (Program Controls Division – currently part of PMD), if necessary</td>
</tr>
<tr>
<td>Level 2: between $5M and $30M</td>
<td>Complete Risk Register with formal workshop</td>
<td>Project Manager, with assistance from Risk Coordinator (Program Controls Division – currently part of PMD), holds formal risk workshop, populates, monitors, and updates risk register</td>
</tr>
<tr>
<td>Level 3: &gt;$30M</td>
<td>Complete Risk Register with formal workshop and quantitative analysis</td>
<td>Specialized third-party facilitated workshop and quantitative analysis, if needed. Project Manager, with assistance from Risk Coordinator (Program Controls Division – currently part of PMD), holds formal risk workshop, populates, monitors, and updates risk register</td>
</tr>
</tbody>
</table>

The risk assessment levels in the table above are only intended to serve as guidelines. The project team should consider other factors, such as political sensitivity, complexity of project, unique budget/schedule constraints, to determine what level of risk assessment is appropriate. Generally, the more complex and critical the project, the more comprehensive the risk assessment approach. For example, irrespective of the project’s total cost, a Level 3 risk assessment approach might be appropriate if any of the following are anticipated:

- Justification/validation of additional contingency
- Severe budget and schedule pressure
- New or innovative application of technology
- Technical complexity
- High priority
- Substantial stakeholder involvement (including political pressures)
- Big revenue impact
- High failure consequence (e.g. hazardous conditions, regulatory penalties, loss of grant funding)
Roles and responsibilities summarized in the table above are envisioned once the Program Controls Division of the new Bureau structure has been staffed and is functionally providing risk assessment support. Until that time, risk assessment on-call consultants and Risk Coordinators can help Program Managers become more familiar with risk assessment and incorporating it into their projects. Roles and responsibilities are further discussed in the following section. Sample risk register templates can be found in Appendix A.

2.3 Roles & Responsibilities

There are various roles and responsibilities tied to a successful risk assessment plan. It is important that each individual/stakeholder involved in the project planning and execution stages follow-through on their risk assessment and mitigation responsibilities to ensure overall plan and project success. As with the other components in the project lifecycle, the Program Manager has ownership of the risk assessment program. The Risk Coordinator will provide ongoing guidance and assistance to the Program Manager. General roles and responsibilities include, but are not limited to, the following:

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Managers</td>
<td>• Accountable for the overall success of the risk assessment program for the Program Manager’s project or program&lt;br&gt;• Coordinate risk assessment duties with the designated Risk Coordinator&lt;br&gt;• Integrate the resources and time required to execute the risk treatment plan across the entire project including the project budget and schedule&lt;br&gt;• Determine the project team members&lt;br&gt;• Identify risk owners and stakeholders&lt;br&gt;• Coordinate and facilitate the initial and follow-up workshops, with assistance of specialized consultant, as required&lt;br&gt;• Develop and update the risk register with the support of the project team and incorporate it into the project work plan, as necessary&lt;br&gt;• Monitor and update the risk “watch list,” with assistance of project team&lt;br&gt;• Develop, distribute and implement the risk treatment plan&lt;br&gt;• Coordinate with the risk owners to monitor risks and implement risk treatment plans&lt;br&gt;• Maintain proficiency in risk assessment and tools through initial and continuing education</td>
</tr>
<tr>
<td>Role</td>
<td>Responsibilities</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Project Team</strong></td>
<td>• Identify project risks and develop complete descriptions</td>
</tr>
<tr>
<td></td>
<td>• Assess the likelihood and consequence of the risk</td>
</tr>
<tr>
<td></td>
<td>• Assess the impact of risks on project cost and schedule</td>
</tr>
<tr>
<td></td>
<td>• Identify causes/triggers and consequences of the risk</td>
</tr>
<tr>
<td></td>
<td>• Help identify the risk owners and assist in developing the risk treatment strategies (Project team members may be assigned as “Risk Owner”)</td>
</tr>
<tr>
<td></td>
<td>• Perform the risk treatment steps assigned</td>
</tr>
<tr>
<td></td>
<td>• Assist the Program Manager in activities associated with risk monitoring and control</td>
</tr>
<tr>
<td><strong>Risk Coordinator</strong></td>
<td>• Provide ongoing guidance on risk assessment methodology</td>
</tr>
<tr>
<td></td>
<td>• Assist Program Manager with planning and scheduling the workshops</td>
</tr>
<tr>
<td></td>
<td>• Coordinate third party facilitation, as required</td>
</tr>
<tr>
<td></td>
<td>• Assist with updating and management of the risk register</td>
</tr>
<tr>
<td></td>
<td>• Perform risk audits on previously identified risk</td>
</tr>
<tr>
<td></td>
<td>• Develop and maintain the risk database</td>
</tr>
<tr>
<td></td>
<td>• Coordinate updates to Risk Assessment Manual</td>
</tr>
<tr>
<td></td>
<td>• Manage risk consultant contracts</td>
</tr>
<tr>
<td></td>
<td>• Serve as PMD resource on risk assessment process and provide ongoing assistance and training to Program Manager on risk assessment techniques</td>
</tr>
<tr>
<td><strong>Risk Owner</strong></td>
<td>• Develop and implement the assigned risk treatment strategy and provide updates to the Program Manager</td>
</tr>
<tr>
<td></td>
<td>• Monitor the allocated risk(s) and inform the Program Manager of any threats or opportunities to the project. This includes monitoring the risk and informing the Program Manager, if the cause/trigger has occurred and the risk becomes a real event</td>
</tr>
<tr>
<td><strong>Division Director (or designee)</strong></td>
<td>• Ensures the risk assessment plan is created and executed</td>
</tr>
<tr>
<td></td>
<td>• Reviews the plans and progress on a regular basis</td>
</tr>
<tr>
<td></td>
<td>• Signs and authorizes execution of the risk treatment plan</td>
</tr>
</tbody>
</table>
3.0 Risk Assessment Process

3.1 Overview

The risk assessment process is a focused effort to identify and act on risks and opportunities that can affect a project’s scope, schedule, budget and/or quality early in the project and continuously throughout the project life cycle. Completing this process generates proactive approaches and actions to take advantage of opportunities that can improve the outcome of a project and eliminate and/or reduce the negative impact of a risk. A formal risk assessment plan helps to remove arbitrary conservatism or optimism in all identified uncertainties within the project scope. Implementing project risk assessment principles and strategies allows the Port to have processes in place that identify, manage and reduce risks to enable higher performance and increased value.

A risk assessment is a critical element to both program and project delivery cycles. Risk can typically be divided into the following three categories:

- **Political** – for the Port this can be defined as communities, permitting, board priorities, mariners, tenants, unions, approvals, media, and internal stakeholders/project team issues (i.e., not knowing who is really in charge).
- **Technical** – this is the most common for design and construction projects and is typically represented by requirements, regulatory, technology, data, design, construction, maintenance, operations, and life cycle asset management cost. (i.e., health, safety, environmental, etc.).
- **Contractual** – this is most commonly related to funding, negotiations, scope of work, qualification requirements, certification requirements, incentives, penalties and defaults.

A risk assessment approach includes assessing and managing risks. It is a qualitative approach to identifying risk, which includes both the potential gains and losses inherent in risks, and evaluates the likelihood and potential impact. Risk mitigation, the most critical step in the process, is a creative thought process to develop alternatives while capitalizing on the “opportunity” risks and minimizing the likelihood and potential impact of “threat” risks. The major steps of the assessment process are:

- Risk Planning
- Risk Identification and Analysis
- Risk Response
- Risk Treatment and Monitoring

The following figure illustrates the overall Risk Assessment Program methodology for the Port.
3.1.1 Assessment Program Methodology

Figure 2: POLB Risk Assessment Program Methodology/Phases
Continuous Improvement Cycle for Risk Assessment Program
3.2 Risk Planning

This is the information gathering phase to ensure all required details are available and the appropriate stakeholders are identified in order to allow the next steps in the process to occur in an effective and efficient manner. Proper planning will ensure a productive workshop with the necessary outcomes.

The formal risk assessment process begins with the planning portion as outlined in the following steps.

3.2.1 Information and Data Gathering

The following provides a sample of the type of information that should be obtained:

- Programming information and data
- Available contractual information impacting the program or project (i.e. tenant requirements, city agreements, leases, etc.)
- All technical data (environmental plans, plans and specifications, regulatory requirements, etc.)
- Budget data (formal cost estimates, Port budgets, etc.)
- Schedules for program or project delivery
- Other data and information that may impact the program or project lessons learned from previous projects
- Review the risk database to identify past risks that have been identified on similar projects within the Port as a starting point to develop the risk register

Specific documents may vary depending on the type of project. Any information not available can be omitted from the planning stage and added later as it becomes available.

3.2.2 Stakeholder Identification and Involvement

It is critical to the successful outcome of a project to identify risks as comprehensively as possible. Stakeholders should be integrated into the process with invitations to the workshops and included in risk register updates. While the Program Manager may not have control over stakeholder participation, reaching out to all identified stakeholders is an important component of the risk assessment process. Stakeholders often see the program or project in very different ways and are able to help identify risks that may not otherwise be recognized, but may have a profound impact on the program or project at hand.
At the start of the project, the Program Manager must determine all of the potential internal and external stakeholders. The list of stakeholders may increase over the life of the project as the scope and design matures. A list of typical stakeholders can be found in Appendix B.

### 3.2.3 Risk Assessment Team

The risk assessment process is best accomplished with a team approach. The team should be a group of individuals knowledgeable about the program or project under study. A larger team is not always the most beneficial, so the Program Manager should focus on an appropriate team composition. This is critical to the success of the process and to achieve productive outcomes. As the Program Manager, it is important to lead this effort, with input from the Risk Coordinator, ensuring the appropriate team members are identified. Appropriate team members would be selected based on the required disciplines of each project. The following list represents the team members that should typically be included during the risk assessment workshop(s). A risk assessment team member involved in the initial workshop should be involved in the subsequent workshops, as necessary.

- Program Manager
- Risk Coordinator
- Risk Management
- Outside Facilitator (as needed)
- Design Manager/Consultant
- Planning Bureau
- Real Estate
- Trade Development
- Utilities
- Construction
- Design disciplines
- All other affected external stakeholders

### 3.2.4 Determine the Level of Project Complexity

Section 2.2 provides a guide for determining the level of risk assessment to be undertaken and applied to the project. However, once more project information is known, the Program Manager, along with the Risk Coordinator, should consider other factors to determine the level of effort needed for the project risk assessment. This decision will need to be made to ensure that the appropriate approach is used to manage risk throughout the program/project.
3.2.5 Review Existing Data

- Review the existing control database to understand what is available to aid in the mitigation and control of risks
- Review lessons learned from previous projects
- Review the risk database

3.2.6 Logistics

During the planning stage, it is important for the Program Manager, with assistance from the Risk Coordinator, to identify and share the logistical information needed, including:

- Determining if the services of an outside risk facilitator should be engaged or if the Program Manager, with assistance from the Risk Coordinator, can lead the process with the project team
- Preparing agendas
- Scheduling the workshops; meeting location, etc.
- Establishing ground rules for the workshop
- Preparing invitations for the team and stakeholders
- Gathering all of the project data and information to support the workshop

Responsibilities for the items above can be discussed on a project by project basis and administrative staff are also available to assist with the logistics.

3.2.7 Determine Workshop Approach

The risk workshop is the formal meeting at which the project team brings together all of the risk planning elements. This formal workshop will allow the identified individuals to work together in a team approach. The team will come together and use the tools identified in this manual to develop the risk register as described in section 3.3.1. In addition, train-the-trainer level workshops and annual refreshers shall be provided to the Risk Coordinator and other designated team members to lead the risk assessment process. Different types of workshops/meetings should be held depending on the type of risk assessment that is required. An initial meeting or formal workshop to complete the register may be a half day to 3 day workshop, depending on the complexity of the project. Depending on the complexity of the project or desire of the Program Manager, an outside facilitator can be engaged or the Program Manager, with assistance from the Risk Coordinator, can lead this effort (see Appendix D for more information about facilitating the process). It is important to do the analysis in a multi-disciplined team environment. This allows you to benefit from the expertise of the various disciplines or
elements involved in the project to identify potential project risks. Types of workshops will include the following:

- **Initial workshop** – this workshop is defined as the first risk assessment workshop for a project.
- **Follow-up workshop** – this workshop is defined as an update to the risk register as the project moves from project phase to project phase.
- **Risk register update meetings** – these are not formal workshops but updates with the project team on a monthly basis throughout the project.

### Less Complex Approach

The initial workshop, with a less complex approach, may require a few hours to a full day workshop, depending on the size, complexity and importance of the project. The more complex the project, the more time will be required during the workshop. The initial workshop will address every aspect of developing the plan including identifying, assessing and developing the risk treatment plan. The Program Manager, with input from the Risk Coordinator, should also decide on the need to either lead the risk assessment workshop or engage the Port’s risk assessment service provider to aid in this effort. However, in either case, the approaches and tools as presented in this manual shall be implemented in their entirety.

### Rigorous Approach

The initial workshop, with a rigorous approach, may require up to a 2 to 5 day formal workshop, depending on the complexity of the project. Workshops can be run over several weeks to ensure there is minimal disruption to delivery of the project. A more formal workshop may require an experienced risk assessor/outside facilitator to lead and run a type of quantitative simulation as described in section 3.6.

### 3.2.8 Determine Risk Context

An important part of risk planning is to develop a concise statement to define the scope or boundary of the risk assessment to ensure that a focused assessment occurs that assists in delivering the project objectives. Any project can have hundreds of risks, but the process of determining the context helps to narrow down to those risks that are more likely and have bigger impacts, rather than small and/or unlikely risks. For larger projects, a helpful component of establishing the context is to determine the appropriate project scale for the Likelihood and Consequence table (Figure 3). There are two sections in the Likelihood and Consequence table that should be reviewed, adjusted, and defined for each project – Financial and Schedule. The scale should be customized to each project. As a guide, for the Catastrophic category, 20% of the total costs of the
A project can be used as a starting point. As discussed in the next section, the scale will be used to evaluate each risk.

**Figure 3 Sample Likelihood and Consequence Table**

Below are some suggested likelihood and consequence scales. Project teams are advised to review the categories and determine a scale that is relevant to their project; in particular the ‘Financial’ and ‘Production/Schedule’ categories should be modified to be specific to each project. All fields should be reviewed and amended/deleted as required prior to commencing the brainstorming portion of the formal workshop.

<table>
<thead>
<tr>
<th>Likelihood Category</th>
<th>E</th>
<th>D</th>
<th>C</th>
<th>B</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare</td>
<td>Highly unlikely to occur on this project</td>
<td>Given current practices and procedures, this event is unlikely to occur on this project</td>
<td>The event has occurred on a similar project</td>
<td>The event is likely to occur on this project</td>
<td>The event is very likely to occur on this project, possibly several times</td>
</tr>
<tr>
<td>Unlikely</td>
<td>OR</td>
<td>5% chance of occurring</td>
<td>20% chance of occurring</td>
<td>50% chance of occurring</td>
<td>80% chance of occurring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consequences</th>
<th>1 - Insignificant</th>
<th>2 - Minor</th>
<th>3 - Moderate</th>
<th>4 - Major</th>
<th>5 - Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety and Health</strong></td>
<td>First Aid Case</td>
<td>Minor Injury, Medical Treatment Case with/ or Restricted Work Case</td>
<td>Serious Injury or Lost Work Case</td>
<td>Major or Multiple Injuries, permanent injury or disability</td>
<td>Single or Multiple Fatalities</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>No impact on baseline environment. Localized to point source. No recovery required</td>
<td>Localized within site boundaries. Recovery measurable within 1 month of impact</td>
<td>Moderate harm with possible wider effect. Recovery in 1 year</td>
<td>Significant harm with local effect. Recovery longer than 1 year</td>
<td>Significant harm with widespread effect. Recovery longer than 1 year. Limited prospect of full recovery</td>
</tr>
<tr>
<td><strong>Financial</strong></td>
<td>&lt;$1MM</td>
<td>&lt;$5MM - $50MM</td>
<td>$50MM - $200MM</td>
<td>$200 - $400MM</td>
<td>&gt;$400MM</td>
</tr>
<tr>
<td><strong>Schedule</strong></td>
<td>Up to 3 days</td>
<td>3 days - 1 week</td>
<td>1 week - 1 month</td>
<td>1 - 2 months</td>
<td>&gt;2 months</td>
</tr>
<tr>
<td><strong>Reputation</strong></td>
<td>Localized temporary impact</td>
<td>Localized, short term impact</td>
<td>Localized, long term impact but manageable</td>
<td>Localized, long term impact with unmanageable outcomes</td>
<td>Long term regional impact</td>
</tr>
<tr>
<td><strong>Operational/Business Impact</strong></td>
<td>Impact can be absorbed through normal activity</td>
<td>An adverse event which can be absorbed with some management effort</td>
<td>A serious event which requires additional management effort</td>
<td>A critical event which requires extraordinary management effort</td>
<td>Disaster with potential to lead to collapse of the project</td>
</tr>
</tbody>
</table>
3.3 Risk Identification and Analysis

The next step in the risk assessment process is risk identification and analysis. The process will start by identifying all of the potential risks associated with the program or project. The next steps include rating the risks, determining cost and/or schedule impacts due to the risk, determining the disposition of the risk and then assigning responsibility. Each of these phases is described in detail within this section of the manual.

3.3.1 The Risk Register

A simple yet effective approach to identifying, rating and managing project risks is by using a tool known as a risk register. This tool is used to help the Program Manager effectively identify and assess the risks on each project. The register is a dynamic and living document and not a static tool. It should be used throughout the project, from the beginning through commissioning and all the way to the operations/asset management stages of the project. It is also a valuable tool that can be handed over to the construction division when and if necessary, to identify the challenges and mitigation measures that have been included or still need to be addressed and integrated in construction. The tool is an Excel spreadsheet designed with macros configured to show the severity of the risk and its treatment via mitigation measures. Many functions of the risk register are automatically updated based on manual entries. The type of risk register to use will depend on the needs of the project. Risk register templates, associated documents, and instructions will be available on EDRMS, however in the interim the Risk Coordinator can help select and provide the appropriate template. Sample risk register templates can be found in Appendix A.

3.3.2 Risk Identification

During the initial risk meeting or workshop, team members brainstorm all of the potential risks, including threats and opportunities. A sample list of threats and opportunities can be found in Appendix C. The importance of having a team approach, with knowledgeable team members, diversified experiences and backgrounds is paramount. The diversity of the team plays an important role in ensuring that the team is as thorough as possible. It is recommended to first brainstorm a list of all the project risks before evaluating each risk.

At minimum, the following information will be needed for each risk:

- **Risk Description** – Provide a description of the risk.
- **Risk Consequence** – Identify the potential impacts if the risk should occur, include both schedule and cost impacts.

See Appendix A for additional information that may be needed to identify and categorize each risk.
3.3.3 Rating the Risks

Once all of the potential risks have been identified, the next step is to evaluate and rank the risks using the risk register. Refer to the Likelihood and Consequence Standard List (Figure 3). During the planning phase, this scale should be updated, as needed, to reflect the specific project. In order to understand the overall impact of a risk, several things must be considered. These include the following:

- **Consequence of the Risk** – The team identifies how severe the impact of the risk will be on the project if it occurs. This is usually described as a number and is categorized as Catastrophic, Major, Moderate, Minor or Insignificant. There is also “Opp” listed in the drop down menu, this is to be selected if this is a positive opportunity that the team wants to take advantage of during the project.
- **Likelihood of the Risk** – The team identifies the likelihood that the risk will occur. This is usually described and categorized as Almost Certain, Likely, Moderate, Unlikely or Rare.

See Appendix A for additional information to rate each risk.

3.4 Risk Response

3.4.1 Action Plan Type

The following provides a more detailed definition of each of the action plan strategies.

**Negative Risks (Threats)**

- **Avoid/Eliminate** – Risk avoidance involves changing something in the project to avoid or eliminate the risk. Some risks that arise early in the project can be avoided by clarifying requirements, obtaining information, improving communication or acquiring expertise.
- **Transfer/Share** – This requires shifting the negative impact of the risk to a third party. Transferring liability of the risk simply gives the management of the risk to a third party, it does not eliminate the potential exposure to the Port. Usually where there is risk, there is a cost or schedule impact, or both.
- **Reduce the Likelihood (Mitigate)** – Risk mitigation implies a reduction in the likelihood of an adverse risk event to an acceptable threshold. Taking early action to mitigate the event is better than trying to repair or deal with the element after the fact.
- **Reduce the Consequence (Mitigate)** – Risk mitigation implies a reduction in the consequence of an adverse risk event to an acceptable threshold.
• **Reduce the Likelihood and Consequence (Mitigate)** – Risk mitigation implies a reduction in the likelihood and consequence of an adverse risk event to an acceptable threshold.

• **Accept** – There are risks on projects that may occur, regardless of what is done to avoid or mitigate them. These risks are usually “accepted” and accounted for in the project scope, schedule and budget through the contingency. Accepted risks should continue to be monitored to ensure that they do not negatively impact the project.

**Opportunities** – When evaluating the opportunities, the following definitions may help to better understand the benefits associated with the opportunity.

• **Accept** – This is for opportunities where the Port may wish to ensure that the opportunity is realized. For example, this might include paying for more resources to potentially eliminate an unknown in the schedule or improving the level of resources to ensure that a task is completed in less time.

• **Share** – Sharing means apportioning ownership of the risk between the Port and a third party who is best able to capture the opportunity for the benefit of the project. This might include forming partnerships for the express purpose of placing the opportunity with a group that can best take advantage of the opportunity. This might include using specifications that are more performance driven then prescriptive to ensure that certain risks would be borne or shared by others.

• **Enhance** – This strategy modifies the impact of an opportunity by increasing the probability and/or positive impacts and identifying and maximizing key drivers. This might include seeking to facilitate or strengthen the cause to increase the probability that the risk will occur.

3.4.2 Risk Treatment

All levels of risk assessment are required to identify the following response to each risk:

• **Risk Treatment Plan** – Define how the risk will be managed and whether a Supplemental Risk Treatment Plan will be completed for the risk.

• **Responsible Person** – Identify the responsible person/organization (risk owner) for managing and tracking the risk mitigation through implementation.

• **Due Date** – Identify when the risk must be treated or followed-up.

• **Action Progress Status** – This will provide an on-going status report as to the disposition of the risk.

• **Total Cost to Action** - Determine the order of magnitude of the costs to implement the treatment plans to manage the risks, including any unique costs.
3.5 Supplemental Treatment Plan

3.5.1 The Process

It is important to understand that the entire project risk process must be proactively managed. Identifying and assessing the risks are only the first steps in using this process as an effective project management tool. Risk management consists of developing a mitigation plan, establishing timelines within the project delivery process for updating the risk register, using the tool for making decisions and helping keep management informed of project elements. The following provides details for completing the supplemental treatment plan for each of the risks identified as requiring specific action items.

3.5.2 Developing the Treatment Plan

Introduction

Once the risk assessment has been completed, the next step in the process is to develop a plan of action to address the disposition strategies as previously identified. Refer to the risk register that was completed. A risk treatment plan should be prepared on how the identified risks should be tracked and managed. The Supplemental Treatment Plan is a management tool available to help track the action plans. This tool is used jointly with the risk register and is a part of the entire Excel workbook.

The Plan

The risk register includes a risk treatment plan for each risk. Further development of the risk treatment plan may be assigned to a team member or risk owner. The supplemental risk treatment plan provides a detailed worksheet for further development (See Supplemental Risk Treatment Plan Figure 4). As a risk is identified as needing a supplemental treatment plan (not every risk will have a supplemental treatment plan developed), additional information should be discussed, identified and analyzed as the plan is developed. The Causes, Impacts and Existing Preventative Controls for each risk need to be identified. A description of each of these elements follows below.

Causes - Once the risk has been identified as needing a Supplemental Treatment Plan, the risk management team then identifies the potential causes of the project risk. This discussion allows the team to delve deeper into the risk to ensure that they understand what is actually causing the risk or “triggers” to ensure that plans can be put into place that help to focus on those causes. Sometimes teams gloss over small causes that might develop into much larger issues if not dealt with earlier in the project.
Consequences - Every risk has consequences. This is a good opportunity to understand the risk even further and gain an understanding of the overall impacts of the identified project risk. This should include other elements beside cost and schedule.

Existing Preventative Controls - Many risks have been dealt with on numerous Port projects over the years. There may already be existing controls in place within the Port that will aid in managing the identified risk. This will ensure that valuable resources are not spent trying to figure out how to manage a particular risk, when in fact, controls are already in-place to manage or mitigate the risk.

Improvement Tasks - This area is for the team to identify what additional measures can be put into place to manage the risk. Specific action items are identified, referencing which cause this action item relates, identify when the action item is to be completed, and who is responsible for taking the action.

Once this additional information has been identified, the Improvement Tasks or Action Plans will be developed on how to manage the identified project risk. Risks that have an overall risk rating identified as Extreme and High will usually have specific detailed treatment plans developed. Some that are identified as Moderate, depending on the cost and schedule impacts, may also have plans developed. The team will need to make this determination. The project risk ratings that are much lower are considered to be on a “watch list”. This is not a separate list but is shown on the risk register for the Program Manager to continue to monitor to ensure they do not negatively impact the project. The “watch list” items may, at some time in the future, be reclassified in the risk register and a supplemental treatment plan developed.
3.6 Quantitative Risk Assessment Tools

When it is important to undertake a more detailed evaluation, additional tools are available to aid in this further assessment. This includes different types of tools such as Monte Carlo, Simulation Crystal, etc. These tools are a quantitative, electronic analysis of the project cost and schedule risk. Quantitative tools perform thousands of iterations on combinations of project risks to achieve the results of the simulation. As in all other electronic analyses, good data in yields good results out.

A quantitative risk analysis uses the inputs on the consequences and likelihood of each risks to run simulations of the project risks. The software develops, from the results of the simulation, a probability distribution of the total cost of all risks and total delay to the project from risks identified in the risk register. It is shown as a graph of portfolio adverse consequences on the Y-axis and likelihoods of non-exceedance on the X-axis. See Figure 5 for an example of results from a Monte Carlo simulation for cost risks.
Based on the quantitative analysis, a number (cost consequence) with an associated probability of non-exceedance can be identified that can be used for a contingency estimate based on the degree of certainty desired. POLB has chosen the 70th percentile as a basis for estimating the contingency. In other words, the quantitative analysis for a particular project will provide a risk-adjusted contingency number for which there is a 70% certainty that the project will not exceed. This risk-based contingency will help determine the need for additional time or budget contingency beyond the ordinary project contingency amount. This analysis can be used to answer such questions as:

- How much contingency reserve of time or money is needed to provide the agency with a sufficient degree of certainty?
- Using sensitivity analysis, which activities or line-item cost elements contribute the most to the possibility of overrunning schedule or cost targets?
- How much additional budget and contingency must be allocated to the project?
- How much additional time and contingency must be allotted to the project schedule?
- What changes might we make to the scope of the work to meet the allocated budget and/or the expected schedule?
4.0 Managing the Plan (Monitoring and Control)

4.1 Introduction

As discussed within the project risk treatment planning portion of this document, the on-going risk assessment and treatment process is critical to the overall process. Just identifying the risks on a project is not enough, it is critical to continuously monitor and update the established plan and risk register. The Program Manager, in concert with the Risk Coordinator, should keep track of the identified risk; reanalyze the existing risks and provide updates of newly identified risks; execute the project risk treatment plans; evaluate the project risk treatment plan effectiveness as the project progresses; and monitor the response/action plan. Additionally, the Program Manager is responsible for monitoring the “watch list”, which represents the risks identified as Moderate or Low, to ensure that any of those identified project risks do not negatively impact the project or that an identified opportunity which might be taken advantage of to improve the project is not missed. The risk register, which includes the “watch list”, should be reviewed, at a minimum, at the monthly project meetings between the Program Manager and the project team. The frequency of the review will be based on the particular phase of the project. In addition, the level of appropriate monitoring will vary based on the need and complexity of each project. The following outlines the typical duties of the Program Manager in concert with the Risk Coordinator in monitoring and controlling the risk assessment process.

4.2 Using the Plan for Decision-making and Keeping Management Informed

Developing the plan is a process that allows the Program Manager and management to make decisions that impact the project. Keeping management informed will also include keeping the Risk Management Division informed of the risks being mitigated for each project. This process is used to help manage the challenges and risks of a project during the appropriate time in project delivery versus waiting until construction to discover that certain risks will negatively impact the project. The construction phase of the project is not the most cost effective time to make major changes that could have been managed in a previous project phase. Using the risk identification and assessment process helps the Program Manager understand the potential impacts to a project including scope, schedule and budget and make the necessary decisions to ensure the project can be completed as budgeted and within the time scheduled.

This process should be used to keep management informed of impacts to the project and of the need for their approval to make decisions that support the positive outcome of the project. As the Program Manager updates the risk register, this tool can be used as a communication tool by providing the information to management to keep them apprised of issues and concerns.
This also aids in providing more timely decisions as critical issues have been tracked and managed.

At a minimum, the significant/priority risks within the risk register and supplemental treatment plans should be reviewed monthly with management.

### 4.3 Manage and Update the Risk Register

The risk register is the tool the Program Manager should use to manage all identified risks on the project. Once the initial risk register is complete, it is important to evaluate and update the risk register at each major project milestone and if a new element has been introduced into the project or if a major scope element has changed. As a project evolves through the project development process, new risks are often identified as a project is designed and developed. These risks should be identified and then assessed. The risk register is updated to reevaluate the existing risks and add new risks that are identified.

As changes occur, if a Monte Carlo model was used, it may need to be updated to account for the new risks or reassessing existing risks. Once this has been completed, as needed, the risk register and risk treatment plans should be updated.

#### 4.3.1 Manage and Update the Project Risk Treatment Plan

As new risks are identified, the risk treatment plan should be updated to identify how the risks will be managed. Additionally, the Risk Coordinator will perform risk audits on the effectiveness of the risk treatment plan on the previously identified risks to ensure the plans are being implemented as well as whether the treatments are still an effective approach for managing the risk. If it is determined that changes should be made, the treatment plan should be used to develop additional mitigation measures.

### 4.4 Monitor the “Watch List”

The “watch list” is part of the initial risk identification and assessment process. Those risks were identified as Moderate or Low risks in the risk register. It is important to continually monitor these risks. A risk identified on the “watch list” may increase in priority or impact throughout the project. If so, the ranking may need to change (this risk may escalate to a higher priority) and a supplemental risk treatment plan may need to be developed. Other risks may be added to the “watch list” as identified throughout the different phases of project delivery. The Program Manager must monitor this list closely to ensure that deadlines to mitigate negative impacts are met.
5.0 CONCLUSION

As discussed in the Introduction of this manual, risk assessment will be an integral part of the Port’s project delivery program. The benefits are many to the Port, program and each project. This information will be used to improve communication, problem solving and decision-making as well as improve a project’s scope, schedule and budget. Providing this data to the Risk Management Division will also aid the Port in adjusting liability and indemnification costs for a project depending on the risks identified and mitigated.

This program is supported by all levels of management and will be integrated into the project development plan. The Program Manager is expected to work closely with the Risk Coordinator to schedule the risk assessment process for every project and at each phase of development.
6.0 APPENDIX
## Risk Register and Action Plan

<table>
<thead>
<tr>
<th>Risk Description</th>
<th>Expected Risk Consequence Before Treatment ($</th>
<th>Risk Level Before Treatment</th>
<th>Action Plan Type</th>
<th>Risk Treatment Plan</th>
<th>Due Date</th>
<th>Risk Level After Treatment</th>
<th>Risk Status</th>
<th>Responsible Person &amp; Organization</th>
</tr>
</thead>
</table>

### Column Key:
- **High**

### Likelihood Category:
- **Low**

### Risk Severity Before Treatment:
- **Number**

### Risk Severity After Treatment:
- **Rank**

### Disclaimer:
The inclusion in reports and tracking systems of POLB risk estimates of likelihood and probability of cost, schedule or scope impacts, including but not limited to Estimate at Completion, Forecast Finish date, POLB Cost Estimate, POLB Time Estimate, Cost Issues, etc., does not indicate Port agreement as to entitlement or amount and is not to be construed as an admission for any purpose.
### Risk Register Template

<table>
<thead>
<tr>
<th>Risk Number</th>
<th>Risk Description</th>
<th>Before Treatment</th>
<th>After Treatment</th>
<th>Treatment Cost</th>
<th>Est. Risk Consequence After Treatment - $</th>
<th>Est. Risk Consequence After Treatment - Schedule Likelihood*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Likelihood* Range:
- Rare 5% 0% to 12.5%
- Unlikely 20% 12.5% to 35%
- Moderate 50% 35% to 65%
- Likely 80% 65% to 87.5%
- Almost Certain 95% 87.5% to 100%
- TBD

**Disclaimer:** The inclusion in reports and tracking systems of POLB risk estimates of likelihood and probability of cost, schedule or scope impacts, including but not limited to Estimate at Completion, Forecast Finish date, POLB Cost Estimate, POLB Time Estimate, Cost Issues, etc., does not indicate Port agreement as to entitlement or amount and is not to be construed as an admission for any purpose.
Sample List of Port Stakeholders

The following list provides a preliminary list of potential project stakeholders internal and external to the Port. The Program Manager should identify all of the necessary stakeholders that should be included in the risk assessment process.

<table>
<thead>
<tr>
<th>Table 1 – Potential POLB Stakeholder List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Harbor Commissioners</td>
</tr>
<tr>
<td>City of Long Beach</td>
</tr>
<tr>
<td>Program Management</td>
</tr>
<tr>
<td>Engineering Design</td>
</tr>
<tr>
<td>Construction Management</td>
</tr>
<tr>
<td>Government Affairs</td>
</tr>
<tr>
<td>Information Management</td>
</tr>
<tr>
<td>Finance</td>
</tr>
<tr>
<td>Maintenance</td>
</tr>
<tr>
<td>Real Estate</td>
</tr>
<tr>
<td>Utilities</td>
</tr>
<tr>
<td>Environmental Planning</td>
</tr>
<tr>
<td>Risk Management</td>
</tr>
<tr>
<td>Traffic</td>
</tr>
<tr>
<td>Security</td>
</tr>
<tr>
<td>Master Planning</td>
</tr>
<tr>
<td>City Attorney</td>
</tr>
<tr>
<td>Operations</td>
</tr>
<tr>
<td>Contractor/Suppliers</td>
</tr>
<tr>
<td>Regulatory/Compliance/Permits</td>
</tr>
<tr>
<td>Contract Compliance</td>
</tr>
<tr>
<td>Grants Manager</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2 – External Stakeholder List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenants</td>
</tr>
<tr>
<td>Oil Companies</td>
</tr>
<tr>
<td>ChemOil</td>
</tr>
<tr>
<td>Shell</td>
</tr>
<tr>
<td>Tidelands</td>
</tr>
<tr>
<td>THUMS Oil</td>
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<tr>
<td>TOPKO</td>
</tr>
<tr>
<td>BP</td>
</tr>
<tr>
<td>Golden West</td>
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<tr>
<td>PetroDiamond</td>
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<tr>
<td>Aera Energy</td>
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<td>TOSCO</td>
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<tr>
<td>Equilon</td>
</tr>
<tr>
<td>Conoco Phillips</td>
</tr>
<tr>
<td>Railways</td>
</tr>
<tr>
<td>Pacific Harbor Lines</td>
</tr>
<tr>
<td>Burlington Northern Santa Fe Railway (BNSF)</td>
</tr>
<tr>
<td>Union Pacific Railroad</td>
</tr>
<tr>
<td>Federal Railroad Administration</td>
</tr>
<tr>
<td>Utilities</td>
</tr>
<tr>
<td>Verizon</td>
</tr>
<tr>
<td>Pacific Energy</td>
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<tr>
<td>Southern California Edison</td>
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<tr>
<td>Southern California Gas Company</td>
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<tr>
<td>City of Long Beach Gas &amp; Oil Department</td>
</tr>
<tr>
<td>Long Beach Water Department (Water and Sewer)</td>
</tr>
<tr>
<td>Other Stakeholder Groups (Public)</td>
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<tr>
<td>Jacobsen Pilots</td>
</tr>
<tr>
<td>Other Port Terminal Operators and Tenants</td>
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<tr>
<td>Other Stakeholders (Private)</td>
</tr>
<tr>
<td>Local Agencies</td>
</tr>
<tr>
<td>City of Long Beach</td>
</tr>
<tr>
<td>Police</td>
</tr>
<tr>
<td>Planning &amp; Building</td>
</tr>
<tr>
<td>Fire Department</td>
</tr>
<tr>
<td>Department of Public Works</td>
</tr>
<tr>
<td>Parks, Recreation, and Marine</td>
</tr>
<tr>
<td>City of Los Angeles</td>
</tr>
<tr>
<td>Department of Public Works</td>
</tr>
<tr>
<td>Department of Water and Power</td>
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<tr>
<td>Port of Los Angeles</td>
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<tr>
<td>Los Angeles County</td>
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<tr>
<td>Sanitation Districts</td>
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<tr>
<td>Flood Control District</td>
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<tr>
<td>Sheriff’s Department</td>
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<tr>
<td>Metropolitan Transportation Authority</td>
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<tr>
<td>Alameda Corridor Transportation Authority</td>
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<tr>
<td>State Agencies</td>
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<tr>
<td>California Department of Toxic Waste</td>
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<tr>
<td>California Regional Water Quality Board</td>
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<tr>
<td>California Public Utilities Commission</td>
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<tr>
<td>Caltrans</td>
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<tr>
<td>State Lands Commission</td>
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<tr>
<td>Federal Agencies</td>
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<tr>
<td>Homeland Security</td>
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<tr>
<td>Federal Bureau of Investigation</td>
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<tr>
<td>US Coast Guard</td>
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<tr>
<td>City, State, and Federal Fish and Game</td>
</tr>
<tr>
<td>US Customs and Border Protection</td>
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<tr>
<td>Federal Highway Administration</td>
</tr>
<tr>
<td>Naval and Maritime Administration</td>
</tr>
<tr>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>Construction</td>
</tr>
<tr>
<td>Contractors on Site</td>
</tr>
</tbody>
</table>
## Risk (Threat & Opportunity) Brainstorming Prompt List

This Risk Brainstorming Prompt List is provided to aid in the identification of Threats and Opportunities which may arise. It is not exhaustive and should be checked to ensure it is appropriate for the review being undertaken. These prompt words can be related to either opportunities or threats.

The questions to consider are: “What can threaten the key success factors or objectives?”, and “Are there opportunities to enhance successful outcomes?”

### Political
- Civil Disorder
- Economic Stability
- Instability
- Inflation
- Pressure Groups
- Racial/Religious Conflict
- Revolution
- Sanctions
- Terrorism
- War
- Labor Unions

### Political Change
- Government
- Law
- Policies

### Regulations/Permissions
- Approvals
- Chemical
- Credits
- Environmental
- Labor and Human Rights
- Legislation
- Licenses
- Noise
- Occupational Health and Safety
- Permissions
- Radiological
- Reporting Requirements

### Contract
- Arbitration
- Completion Requirements
- Confidentiality
- Contractors
- Funding
- HSE Primacy
- Insurance
- Intellectual Property
- Interaction (Other Contracts)
- Language
- Legal Jurisdiction
- Payment Currency
- Payment Terms

### Provisions
- Scope and Completeness
- Termination
- Terms and Conditions
- Variations/Claims

### Contract Liabilities
- Consequential Damages
- Design Liabilities
- Force Majeure
- Guarantees
- Liquidity Liabilities
- Penalties
- Performance/Acceptance

### Finance
- Cash flow
- Cost Management
- Foreign Exchange (FX)
- Funding
- Information
- Invoicing
- Liquidity
- Non-Billable
- Revenue/Profits
- Repatriation
- Taxation
- Transparency

### Customer
- Cancellation
- Contractors
- Culture/Attitude
- Design Standards
- Experience
- Funding
- HSE Management System
- Interface
- Involvement
- Language
- Litigation
- Ownership
- Process
- Program
- Relationship
- Repudiation
- Site/Location

### Solvency/Stability

### Community
- Archaeology and Cultural
- Heritage
- Conflict, Security and Crime
- Cultural Identity
- Health Impacts
- Livelihood
- Local Communities
- Noise
- Public Perception
- Recreational Use
- Resettlement
- Visual Impacts

### Environmental/Climate
- Air Quality
- Avalanche/Landslide/Mudslide
- Biodiversity – Flora and Fauna
- Climate Change
- Disease Incidence
- Endangered/Threatened
- Species
- Emissions/Discharges
- Fire/Flood/Drought Potential
- Land Contamination
- Land Use
- Liquid Wastes/Solid Wastes
- Natural Disasters
- Preservation
- Reclamation/Remediation
- Seal Level
- Severe Weather Potential
- Surface/Ground Water
- Watershed Protection
- Wetlands

### Health and Safety
- Conflict
- Crime

### Health and Safety (cont’d)
- Field Work
- Health and Wellness
- Induction
- Medical Assistance
- Overwork/Stress
- Remote Location
Appendix C

Safety
Security Site Activity

Human Resources
Availability
Commitment
Conditions
Contractors
Corporate Memory
Culture
Development
Excess
Experience
Industrial Relations
Leadership
Location/Mobility
Occupational Health and Safety
Retention
Satisfaction/Morale
Skills
Stability/Continuity
Succession Training

Systems
Adequacy
Failure/Lack Of
Information Security
Knowledge Management
Overload
Support
Systems Rollout
Training/Competency
Work Practices

Location/Office
Assets/Equipment
Business Continuity Planning
Crisis and Emergency
Management
Demobilization
Expansion
Infrastructure
Office Space
Overheads
Performance
Reputation
Skill Silo

Delivery Model
Compromise
Differentiators
Economies of Scale
Fast Track
Inefficiency
Delivery Model (cont’d)
Innovation
Leverage
Market Gap/Emerging Markets
Mobilization
Rework
Support
Uncompetitive

Work share

Project Management/Plans
Adequacy/Suitability
Baseline
Communication
Compression
Contingency
Critical
Flexibility/Float
Interface/Interaction
Lessons Learned
Loading
Mobilization
Program

Design Engineering
Abatement Technologies
Assumptions
Authorization/Acceptance
Basis of Design
Change Management
Check Engineering/Verification
Communication
Complexity
Contractors
Control
Cost Estimates
Deliverables
Design Change
Document/Data Management
Economics Theme
Emerging Technology
Engineering Design Systems
Experience
Information
Innovation
Interfaces
Limitations
Maintainability
Materials
Optimization
Organization and Control
Packages Third Party
Contractors
Reliability
Research and Development (R&D)
Responsibilities
Reviews
Scope
Specification

Design Engineering (cont’d)
Safe and Sustainable
Engineering for Asset Lifecycle (SEAL)

Studies
Sustainability
Value Improving Practices

Quality
Assurance Schedule/Program
Assessment (Audit and Review)
Certification (Fraudulent)
Compliance
Competency (Qualification/Training)
Criticality
Continuous Improvement
Control (Process Controls)
Corrective Action
Customer Feedback/Complaints
Document
Management/Changes
Inspection/Testing
Records Management/Review
Preventative Action (Risk)
Standards
System Compliance (ISO 9001)
Tolerances/Calibration
Verification

Procurement
Confidentiality
Contractors
Delays
Evaluation
Expediting
Export Restrictions
Inspection
Logistics
Materials Control
Quality Control
Strategy
Vendor/Supplies

Site/Construction
Access
Accommodation
Change Control
Conflict
Delays
Emergency/Evacuation
Equipment/Tooling
Facilities
Ground/Weather Conditions
Industrial Relations (IR)
Inspection/Tests
Interaction
Interfaces
Labor
Logistics

Site/Construction (cont’d)
Methods
Medical
Modifications/Authorization
Organization and Control
Plant
Productivity
Program
Relocation
Responsibility Control
Appendix C

Restrictions  Security  Transport
Safety  Supervision
Utilities
Working Conditions

Operations/Commissioning
Acceptance/Testing
Authorizations
Availability/Reliability
Commissioning
Decommissioning
Costs
Operability
Performance
Start Up
Throughput
Training
Appendix D

Facilitating the Process

During the risk assessment workshop, the facilitator helps to brainstorm and gather all the risks and opportunities of a project. Knowledge of the project scope and background is required to navigate the participants in a discussion of the concerns and issues on the project in order to identify the risks and opportunities as comprehensively as possible. As the project owner, the Program Manager, with assistance from the Risk Coordinator, can typically perform the role of the facilitator. However, for very large or complex projects a specialized consultant, with additional sophisticated risk analysis tools, may be needed to facilitate the workshops. At the beginning of the project, the Program Manager should discuss with the Risk Coordinator the need for a third-party facilitator.

Facilitation Skills

This portion of the manual is provided to increase the skills of the Program Manager and Risk Coordinator related to their ability to lead or facilitate risk assessment workshops. Facilitation skills are something that must be learned and not all staff members may feel comfortable in that role. The following information is provided as an aid to the Program Manager in their efforts to become a skilled facilitator to ensure the best possible outcomes of the risk process.

“A facilitator is an individual who enables groups and organizations to work more effectively; to collaborate and achieve synergy. She or he is a 'content neutral' party who by not taking sides or expressing or advocating a point of view during the meeting, can advocate for fair, open, and inclusive procedures to accomplish the group’s work” - Michael Doyle quoted in the Facilitator’s Guide to Participatory Decision Making by Sam Kaner.

The basic skills of a facilitator are as follow:

- Timekeeping; keeping the team moving forward
- Keeping the team on track and following an agreed-upon agenda
- Capturing a clear record of the information
- Watching the group and its individuals relative to group dynamics to ensure people are participating and in agreement, as needed
- Tactful communication skills

Facilitators for the Port’s assessment program require a variety of communication skills, such as:

- Complete proficiency in the risk assessment processes and the completion of the risk register
- Ability to ask questions or paraphrase to gain clarity in a discussion
- Keeping the group on topic and knowing when to move on to the next phase in the process
- Draw / elicit comments from people; some may not participate as much as others
- Balance participation; some may participate too much; overwhelming other participants
- Having the appropriate knowledge and skill to intervene in a way that adds to the group's creativity rather than taking away; non-confrontational
- Respect for others
- Assist the group in understanding the differences that divide consensus
Appendix E

References

4) Port of Long Beach Project Delivery Manual