Risk Management Applications for All Airports

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Faith Group
DETOUR METRO • WILLOW RUN
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Information on ACRP

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  - New publications
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- **ACRP Report 74** – Application of Enterprise Risk Management at Airports
- **ACRP Report 107** – Development of a Runway Veer-Off Location Distribution Risk Assessment and Reporting Template
- **ACRP Synthesis 30** – Airport Insurance Coverage and Risk Management Practices

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Today’s Speakers

Moderated by Wayne Sieloff, Vice President of Planning + Strategy Management, Wayne County Airport Authority

1) ACRP Report 116: Guidebook for Successfully Assessing and Managing Risks for Airport Capital and Maintenance Projects
   - Mindy Price, Direct Effect Solutions

2) ACRP Report 131: Safety Risk Management for Airports
   - Dave Fleet, Faith Group LLC, formally of Futron Aviation

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ACRP Report 116: Contributing Team

Enterprise Program Implementation and Previous ACRP Research Publications
Direct Effect Solutions Consultants

Airport Maintenance Project Management and Capital Program Management
Nashville Airport Authority Employees

Construction Contract Management
Hill International Staff
Research Objective

Development of a Guidebook to assist airports in proactively assessing and managing risks associated with capital and maintenance projects to ensure project scope, schedule and budget are met.
## Definition of Project Type

<table>
<thead>
<tr>
<th>Airside</th>
<th>Landside</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects occurring on the airfield, apron, taxiways, runways, tug roads, hangars and landscaping</td>
<td>Projects occurring outside the security perimeter fence. Includes public roadways, parking areas, garages, landscaping</td>
<td>Projects occurring in secure and non-secure areas of the terminal</td>
</tr>
</tbody>
</table>
Research Conclusions

Gap in existing role, use of contractors and consultants with own methods
Lack of common risk management practices and language between departments and airports
Need simple and scalable tools
Small, internal projects need project risk management most
Guidebook Framework

Project Management

Risk Management

Scope

Schedule

Budget

ACRP
AIRPORT COOPERATIVE RESEARCH PROGRAM

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES
ACRP Report 116: Guidebook Purpose

- Consistent Project Risk Management language and tools for airports
- Applicable to all airports regardless of size, geographic location or governance
- Applicable to all project regardless of size, type and complexity
- Organization of material to allow flexibility to reader
- Ability to tailor contents to current environment
- Tool box scalable by project type and complexity
- Immediate applicability of information
Put into Practice

Provide guidebook for all construction consultants and contractors as a resource
Provide guidebook to planning, engineering and maintenance staff as a resource
Embed into internal practices through Enterprise Risk Management, Safety Risk Management, Project Management
Teach project risk management process to internal planning, engineering and maintenance staff
Encourage the use of the simple tools to increase risk management thinking
Practice brainstorming “What could happen”
Focus on both risks and opportunities
Celebrate wins!
Project Risk Analysis

5.3 Project Risk Analysis

5.3.1 Project Risk Analysis

5.3.2 Risk Assessment

Table 5.1 - Project Risk Analysis Results

5.4 Risk Mitigation

5.4.1 Risk Management Plan

5.4.2 Risk Monitoring

5.5 Risk Reporting

The project risk management plan should be developed in collaboration with the project team and stakeholders, and should include the following elements:
- A description of the project risk management process
- Identification of potential project risks
- Analysis of the probability and impact of each risk
- Development of risk strategies for each risk
- Monitoring and communication of risk progress

The project risk management plan should be reviewed and updated regularly throughout the project.
Guidebook Structure

Part I
Overview of risk management process

Part II
Step-by-step process
Best practices
Case Studies

Part III
Tool box

Part IV
Implementation Plan
Part I: Overview of risk management process

1.1.1 What is Project Risk?
Project risk or opportunity is an uncertain event or condition that, if it occurs, has a positive or negative effect on achieving the goals of a project. A risk may also not occur. A risk management plan is developed to identify, analyze, and respond to potential risks.

1.1.2 Project Risk Management Overview

- The purpose of risk management is to identify and mitigate potential risks that could affect project objectives.
- Risk management involves identifying potential risks, assessing their likelihood and impact, and developing strategies to mitigate or control them.

Common Risk Sources:
- Technical
- Funding
- Schedule
- Risk
- External factors

Figure 1.1: General project risk sources.

A comprehensive risk management plan should be developed for each project. The plan should include:

<table>
<thead>
<tr>
<th>Project Risk Management Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Risk Identification</td>
<td>The identification of the potential risks to the project, the probability of occurrence, and the impact on project objectives.</td>
</tr>
<tr>
<td>Project Risk Analysis</td>
<td>The analysis of the identified risks to determine their potential impact on project objectives.</td>
</tr>
<tr>
<td>Project Risk Planning</td>
<td>The planning of strategies to mitigate or control identified risks.</td>
</tr>
<tr>
<td>Project Risk Monitoring and Control</td>
<td>The monitoring of project performance and the control of project risks to ensure project objectives are met.</td>
</tr>
</tbody>
</table>

This framework helps in developing a comprehensive risk management plan that addresses potential risks and ensures project success.

Figure 2.1: Sample project risk management plan.
Part II: Step-by-step
Project Risk Response Planning

Once risks are identified and evaluated as described in Chapters 4 and 5, respectively, the following question remains:

What is the best approach for managing this risk (or exploiting this opportunity)?

The step of risk response planning attempts to answer this question by determining if the identified risks can be:
- Accepted on the basis that the risk and its consequences are minimal or the preventive response would not be feasible;
- Transferred to the contractor or other third party in a manner that is equitable and consistent with the project goals (Note: Risks that are transferred to the contractor or other third party must be managed within their project plan);
- Mitigated by taking certain actions that are expected to reduce the probability of the risk event from occurring or its expected impact; or
- Avoided by eliminating the root cause.

6.1 Key Activities

6.1.1 Process Step Overview

Risk response planning entails the identification, evaluation, and selection of options to reduce risk at acceptable levels given project constraints and objectives. Tasks to be performed under risk response planning include determination and documentation of:
- What should be done.
- When it should be accomplished.
- Who is responsible, and
- How the response should be funded (if there is an associated cost).

Key steps are identified in the following and discussed in further detail in Section 6.3:
- Brainstorm strategies to bring the identified risks to an acceptable level, given the organization’s risk threshold.
- Estimate the cost associated with the implementation strategies.
- Compare benefits of response actions to their estimated cost and benefit.
- Assign individuals to take responsibility for the response action (risk owner).
- Document results and proceed to risk monitoring and control (see Chapter 7).
6.4 Outputs

Once the alternatives have been analyzed, the selected response actions should be documented either by expanding the existing risk register or preparing a stand-alone risk response plan. The following information should be recorded (if not already included in the risk register):

- A description of the identified risk (including a summary of the scope, schedule, and cost impacts; likelihood of occurrence; impact; and whether the risk is within the control of the airport or a third party); and
- Identification of the chosen risk response strategy (i.e., mitigate, avoid, accept, transfer), accompanied by a description of the risk response plan; and
- Cost to respond (i.e., estimated value of the cost to implement the chosen response).

6.5 Best Practices

Risk response planning should generally conform to the following principles and best practices:

- **Consider Project Objectives.** To determine the optimal response strategies, it is important to consider project objectives. It is rarely possible to optimize quality, time, and cost goals on a single project, and therefore, trade-offs may be necessary to ensure that the primary goals are achievable. Understanding the relative importance of individual project goals will help the project team make informed decisions regarding the optimal response strategies to increase the likelihood of achieving the primary project goal (e.g., enhanced quality), even if at the expense of secondary goals (e.g., cost).

- **Consider Risk Prioritization.** The prioritization of risks resulting from the risk analysis step should, for the most part, drive the allocation of resources allocated to reducing the risks to acceptable levels. However, it may be useful to address small or insignificant risks immediately if it would be quick and lose in cost to do so.

- **Engage Stakeholders.** Increased collaboration and communication between project team members and key stakeholders can enhance the identification and development of possible risk response strategies.

- **Incorporate the Planned Responses into the Overall Project Management Plan.** The planned responses should be incorporated into the overall project management plan to the extent that they affect the project budget, schedule, and resource assignments.

- **Assign a Risk Response Owner.** Each risk response should be assigned a single owner who has clear responsibility and accountability for its execution. This individual may or may not be the same as the overall risk owner.

6.6 Summary

Risk response planning entails identifying and implementing actions to address the identified risks and bring them to acceptable levels. Like all of the steps in the risk management process, risk response planning is a scalable activity, as summarized in Table 6.3.

See the continuation of the excerpt from the case study on taxiway reconstruction for more discussion of project risk planning.
Part II: Case Studies

Case Study: Taxiway Reconstruction

This case study will be used later in this guidebook to illustrate the various steps of the risk management process. The complete case study is presented in Appendix A.

Project Overview
A medium-hub airport was preparing to conduct the taxiway reconstruction as defined in the airport’s master plan.

The project was scheduled to begin design in June, with construction expected to begin 6 months later. The reconstruction project was scheduled in alignment with FAA funding schedules in anticipation of receiving funds in time to begin and conduct construction.

The taxiway project was originally scoped for 1,000 ft of asphalt pavement, with an estimated $6 million budget funded by the FAA and airport passenger facility charges at a 75/25 percent ratio.

The funding for this project was fixed. Scope and schedule were the areas that were affected by the risks and mitigations of this project.

The project was being managed by an internal airport project manager, consultants for design, construction by contractors, and inspections by consultant staff.

For the scope of this project, the design-bid-build construction process was selected.

The project risk management process was included in the project management of the project. Many risks were realized throughout the project duration and will be highlighted at each phase throughout this example.
### Part III: Tool Box Template

Exhibit 8.4. The risk register.

<table>
<thead>
<tr>
<th>#</th>
<th>Risk Description</th>
<th>Owner</th>
<th>Date Identified</th>
<th>Risk Analysis</th>
<th>Response</th>
<th>Action to Be Taken</th>
<th>Cost to Respond</th>
<th>Status</th>
<th>Monitoring and Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Probability</td>
<td>Impact</td>
<td>Risk Ranking</td>
<td></td>
<td></td>
<td>Date, Status, and Review Comments</td>
</tr>
</tbody>
</table>


Part III: Tool Box Instructions

Exhibit 8.4. (Continued).

**RISK REGISTER INSTRUCTIONS**

This document is an annotated version of the risk register template and outlines the type of information to be included in the template. Customize the template with appropriate language and content for the unique needs of the airport environment and each project specifically.

<table>
<thead>
<tr>
<th>PROJECT RISK REGISTER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Identification</strong></td>
</tr>
<tr>
<td><strong>Risk Analysis</strong></td>
</tr>
<tr>
<td><strong>Risk Controls</strong></td>
</tr>
<tr>
<td><strong>Risk Summary</strong></td>
</tr>
<tr>
<td><strong>Risk Matrix</strong></td>
</tr>
</tbody>
</table>

- **Risk Identification**
  - Identify the risk name.
  - Describe the risk in detail.
  - Determine the impact and likelihood.

- **Risk Analysis**
  - Calculate the risk priority number (RPN).
  - Evaluate the risk impact.
  - Assess the risk likelihood.

- **Risk Controls**
  - Identify the controls and mitigation strategies.
  - Assign responsibilities.

- **Risk Summary**
  - Summarize the risk details.
  - Provide recommendations.

- **Risk Matrix**
  - Place the risk in the matrix based on impact and likelihood.

For example, were the risks addressed? Based on new information, should the estimates be revised? What are the residual risks, costs, etc.?
### PROJECT RISK REGISTER EXAMPLE

The following is an example of the risk register for an airport project.

<table>
<thead>
<tr>
<th>#</th>
<th>Risk Description</th>
<th>Owner</th>
<th>Date Identified</th>
<th>Risk Identification</th>
<th>Probability</th>
<th>Impact</th>
<th>Risk Ranking</th>
<th>Response</th>
<th>Action to be Taken</th>
<th>Cost to Respond</th>
<th>Status</th>
<th>Monitoring and Control Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regulatory change affects design, affecting project scope, budget, and schedule</td>
<td>John Smith</td>
<td>12/27/2012</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>Accept</td>
<td>Liaison with FAA to remain apprised of upcoming changes</td>
<td>None</td>
<td>Meeting with FAA held on 2/13/2013</td>
<td>As of 2/13/2013, FAA advised of changes to paving requirements on taxiways. Will require describing because budget is fixed. Circular #7</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Limited number of local bidders, resulting in higher cost and schedule uncertainty</td>
<td>Paul Jones</td>
<td>12/27/2012</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>Mitigate</td>
<td>Industry outreach to engage bidder pool</td>
<td>None</td>
<td>None</td>
<td>Circular #7</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Competing priorities among current project, ongoing airport operations, and other projects result in schedule delays</td>
<td>Sue Johnson</td>
<td>12/27/2012</td>
<td>4</td>
<td>4</td>
<td>16</td>
<td>Mitigate</td>
<td>Formal prioritization of program level</td>
<td>Negligible</td>
<td>Standing program review meetings set for every Monday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Construction vehicle access and traffic flow may be limited to accommodate ongoing airport operations, resulting in schedule delays and inefficiency</td>
<td>Sue Johnson</td>
<td>12/27/2012</td>
<td>5</td>
<td>3</td>
<td>15</td>
<td>Mitigate</td>
<td>Minimize traffic disruption by optimizing construction phasing plan</td>
<td>Negligible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Unforeseen conditions delay schedule and affect budget</td>
<td>John Noman</td>
<td>12/27/2012</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>Mitigate</td>
<td>Additional field investigation</td>
<td>$40,000</td>
<td></td>
<td>As of 3/14/2013, additional field investigations indicated underground utility line, requiring redesign.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Airfield incursion resulting in work stoppage</td>
<td>Mike Allen</td>
<td>12/27/2012</td>
<td>5</td>
<td>5</td>
<td>15</td>
<td>Avoid</td>
<td>Training, barriers, markings</td>
<td>$100,000</td>
<td>Training completed on 1/30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part IV: Implementation Plan

Implementing Project Risk Management

9.1 Characteristics of Successful Project Risk Management Processes

Successful project risk management processes will have the following characteristics:

- A focus on managing risk through the use of risk management plans that incorporate risk analysis, risk planning, and risk monitoring and control issues.
- Processes, systems, and methods that are simple to understand and apply to any type of project (construction, investment, financial, marketing, etc.).
- Risk analysis tools that are simple to use and understand.
- Project staff members who understand project risk management and processes, as part of their daily work responsibilities, and whose organization’s risk management processes are consistent with their organization’s risk management practices.
- Processes that are tailored to the risk levels and risk management processes as part of the organization’s overall management processes.
- Processes that can be implemented effectively through the life of a project and are adaptable to an organization’s need to rapidly respond to the changing market and external conditions.
ACRP Report 116

For additional information:
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Mindy.Price@DirectEffectSolutions.com
ACRP Webinar: Risk Management for Airports

Dave Fleet, Faith Group LLC, formally Futron Aviation Principal Investigator
Agenda

• The Project
• Current Status
• Guidebook Contents
• Important Materials
• Conclusion
The objective of this research was to develop a guidebook for airports that:

- Explains Safety Risk Management (SRM)
- Describes how SRM contributes to the SMS
- Details how the SRM process is applied
The guidebook includes the following elements:

- SRM concepts
- The five steps of the SRM process
- Tailoring the process to match the issue’s complexity
- Triggers that identify need for the SRM process
- Glossary of key terms
The guidebook includes the following elements:

• Relevant resources
• Instruction on conducting an SRM panel
  o When – How – Steps – Challenges – Best practices
• SRM documentation and tools
• SRM process summary
  o One-page description / customizable checklist for each SRM role
Current Status

• The Draft Guidebook is completed and under review by ACRP editing staff
• Publication target: May – June 2015
Guidebook Contents

- Divided into Five Parts
- I: Using the Guidebook
- II: Safety Risk Management Concepts
- III: The SRM Process & Application
- IV: SRM in Daily Operations
- V: Safety Risk Assessment (SRA)
- Appendices (A through H)
Guidebook Contents

• I: Using the Guidebook
  o Glossary of Key Terms
  o Introduction
  o Using the Guidebook
    o Key Points
    o Small Airports
Guidebook Contents

- II: Safety Risk Management Concepts
  - The Big Picture – SRM and SMS
  - Risk and Risk Management
  - SRM Phases
  - SRM at Small Airports
Guidebook Contents

• **III: The SRM Process and Application**
  • SRM Five Step Process
  • Applying the SRM Process
  • SRM Applied to Small Airports
Guidebook Contents

- IV: SRM in Daily Operations
  - SRM in Daily Operations
  - Time Critical SRM – ABCD Model
  - Implementing Mitigation Actions
  - Daily SRM for Small Airports
Guidebook Contents

• V: Safety Risk Assessment
  • Introduction to SRA
  • Conducting an SRA
  • Facilitating an SRA
  • SRA for Small Airports
Guidebook Contents

• Appendices:
  A. SRM and the FAA
  B. SRM Handbook
  C. SRM Process Tools
  D. SRM Templates
  E. Preliminary Hazard Lists (PHL)
  F. Typical Accident and Incident Rates
  G. Typical KPI & Associated Data
  H. Basic Probability and Statistics for SRM
Conclusion

• Not a prescription !!!
• Chapters intended to be stand alone
• Provide what YOU need to make YOUR own risk-based decisions
• SRM is worth while regardless of regulation!
THANK YOU!

QUESTIONS?