AACE INTERNATIONAL RECOMMENDED PRACTICE

121R-21

REQUIRED SKILLS AND KNOWLEDGE OF PROJECT RISK MANAGEMENT

AACE INTERNATIONAL

AACE® International Recommended Practice No. 121R-21

REQUIRED SKILLS AND KNOWLEDGE OF PROJECT RISK MANAGEMENT

TCM Framework: 7.6 – Risk Management

Rev. March 1, 2022

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Any terms found in AACE Recommended Practice 10S-90, *Cost Engineering Terminology*, supersede terms defined in other AACE work products, including but not limited to, other recommended practices, the *Total Cost Management Framework*, and *Skills & Knowledge of Cost Engineering*.

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TABLE OF CONTENTS

1. INTRODUCTION

This recommended practice (RP) is intended to serve as a guideline, not a standard. As a recommended practice of AACE International, the intent of the guideline is to define the required skills and knowledge to perform project risk management (PRM). It serves as the foundation of the skills and knowledge of an AACE certified Project Risk Management Professional (PRMP) and provides an outline for its study guide. PRM requires knowledge ranging from analytical (e.g., statistics and modeling) to socio/psychological (e.g., risk elicitation and communication) to management (e.g., risk response planning and management). PRM is practiced within the context of all the processes and practices of total cost management (TCM). All TCM practices have elements of uncertainty and the need to make some decisions, and interfaces with all the associated disciplines working in a TCM process.

1.1. Purpose

This RP highlights the necessary skills and knowledge of a PRM practitioner from a high-level viewpoint. It identifies competencies for a risk management practitioner as it relates to their broad experience in performing technical analyses such as schedule risk analysis, cost risk analysis (or integrated cost-schedule risk analysis) to qualitative risk management that deal with the development of a risk management plan (RMP), risk identification through risk workshops or interviews, qualitative risk assessment, development of risk response planning, and risk monitoring and control during the life of the project. Detailed skills, knowledge, and methodology are excluded from this recommended practice. These skills and knowledge are applicable to the project risk management profession across any industry, portfolio, program, or project in which TCM applies. It is aligned with RP 11R-88, *Required Skills and Knowledge of Cost Engineering* and the *Total Cost Management Framework*.

1.2. Who is a PRMP?

A PRMP is a skilled and knowledgeable practitioner whose role is to establish an effective risk management plan and implement that plan in accordance with the project/program/portfolio's objectives. It is the PRMP's responsibility to clearly communicate in verbal and written forms, both internally and externally. Certification as a PRMP recognizes certificate holders who have demonstrated their expertise in project risk management, which includes the following:

- Supporting Skills and Knowledge.
- Overall Risk Management Terminologies and Concepts
- Risk Management Skills and Knowledge

1.3. What is Risk Management?

The *TCM Framework* (Section 7.6) defines risk management as a systematic and iterative process comprised of four steps:

1. Plan - establish risk management objectives.
2. Assess - identify and analyze risk.
3. Treat - plan and implement risk responses.
4. Control - monitor, communicate and enhance risk management effectiveness.

The goal of risk management is to increase the probability that a planned asset, project or portfolio achieves its objectives. In TCM, potential deviations from plans are all considered potentially adverse to overall performance. In this sense, perceived opportunities may also pose a threat. However, if properly managed, the project or asset management team may be able to capitalize on opportune uncertainties. As discussed in TCM, a key challenge in

planning is bringing an awareness of risk and probability concepts to decisions whether they are implemented or not.

2. RECOMMENDED PRACTICE

2.1. Basis of Project Risk Management Required Skills and Knowledge

This RP outlines those skills and knowledge topics required for a professional to be able to effectively perform the processes and steps outlined in the *Total Cost Management Framework* chapter on *Risk Management* (TCM 7.6). As these processes are highly integrated with and sometimes practiced within the other TCM processes, elements of those are also included.

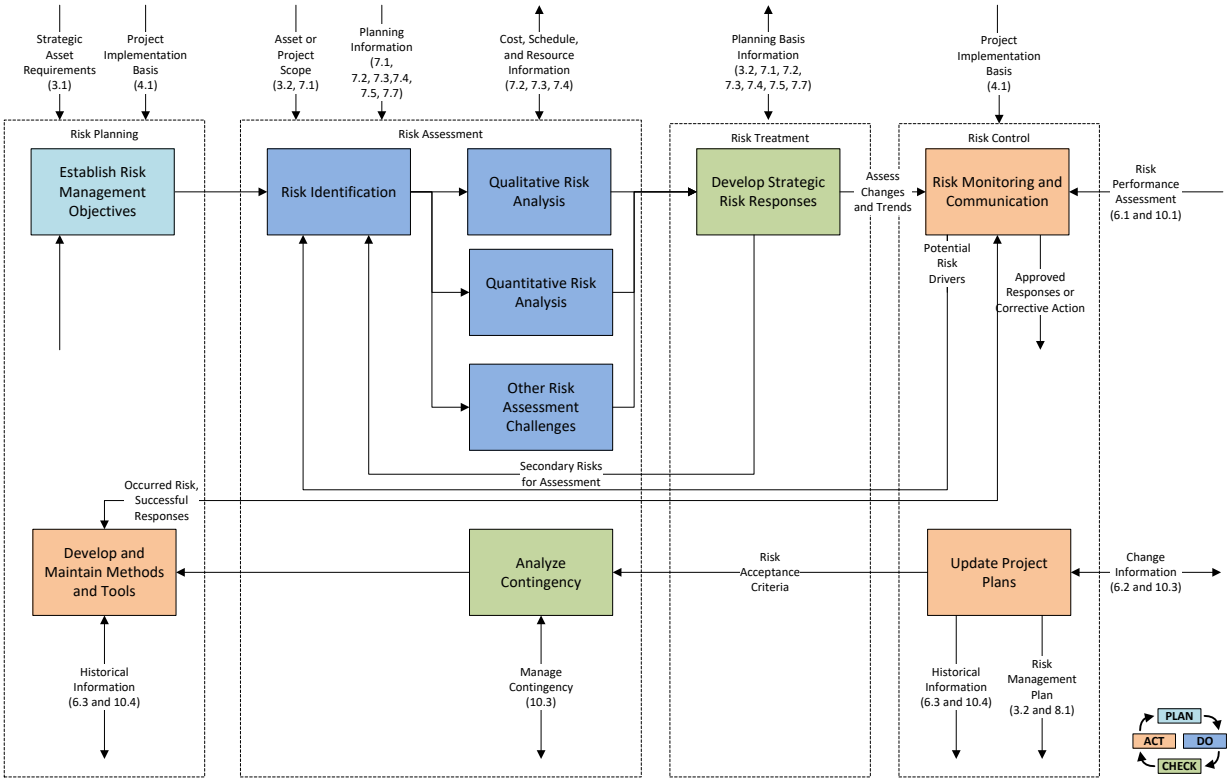

Figure 1. Process Map for Risk Management (TCM 7.6)

The required skills and knowledge of cost engineering are documented in RP 11R-88, *Required Skills and Knowledge of Cost Engineering*, which is a structured outline including performance statements for most topics (e.g., "Be able to define…"). The scope or topic headings for this RP and 11R-88 largely overlap; the difference is primarily in emphasis or the level of required skills. For example, the cost engineer should have application knowledge of schedule model development (e.g., given a schedule network with durations, perform CPM forward and backward pass calculations to determine float) while the project risk management practitioner must have comprehension (e.g., understand the concept of logic networks and CPM). On the other hand, the PRM practitioner must have application knowledge of a range of probability distribution functions (PDF) while a cost engineer need only have comprehension.

In summary, this RP looks at the process and steps of TCM 7.6 and summarizes those in a topic outline focused solely on PRM, adding the missing priority designations. In some cases, additional detail is added (e.g., typical PDFs) and/or performance statements are modified to address specific PRM requirements.

2.1.1. Skills and Knowledge Priority Designations

When assessing the level or degree of skills and knowledge, the following are some generic performance statements that apply:

- Knowledge: Recalls facts and information (e.g., define, list, state, identify, label, name).
- Comprehension: Demonstrates understanding of facts and terminology (e.g., describe, explain, predict, interpret, summarize).
- Application: Can use information in concrete situations (e.g., apply, solve, show, make use of, modify).
- Analysis: Can break material down into its parts, identifying both the parts and their relationships to each other (e.g., differentiate, compare/contrast, distinguish).
- Synthesis: Can put the parts together to produce a unique entity, generate a plan, or derive new relationships (e.g., design, construct, develop, formulate).
- Evaluation: Can use evidence and criteria to judge the value of a thing for a given purpose (e.g., appraise, evaluate, justify, judge, recommend).

This RP only has two designations: primary and secondary (P or S). A primary (P) skills and knowledge topic will be one that the PRM practitioner should be able to understand and perform at any of the levels in the list above. A secondary (S) skills and knowledge topic will be one where the expected understanding is only knowledge and comprehension.

2.2. Outline of Project Risk Management Skills and Knowledge

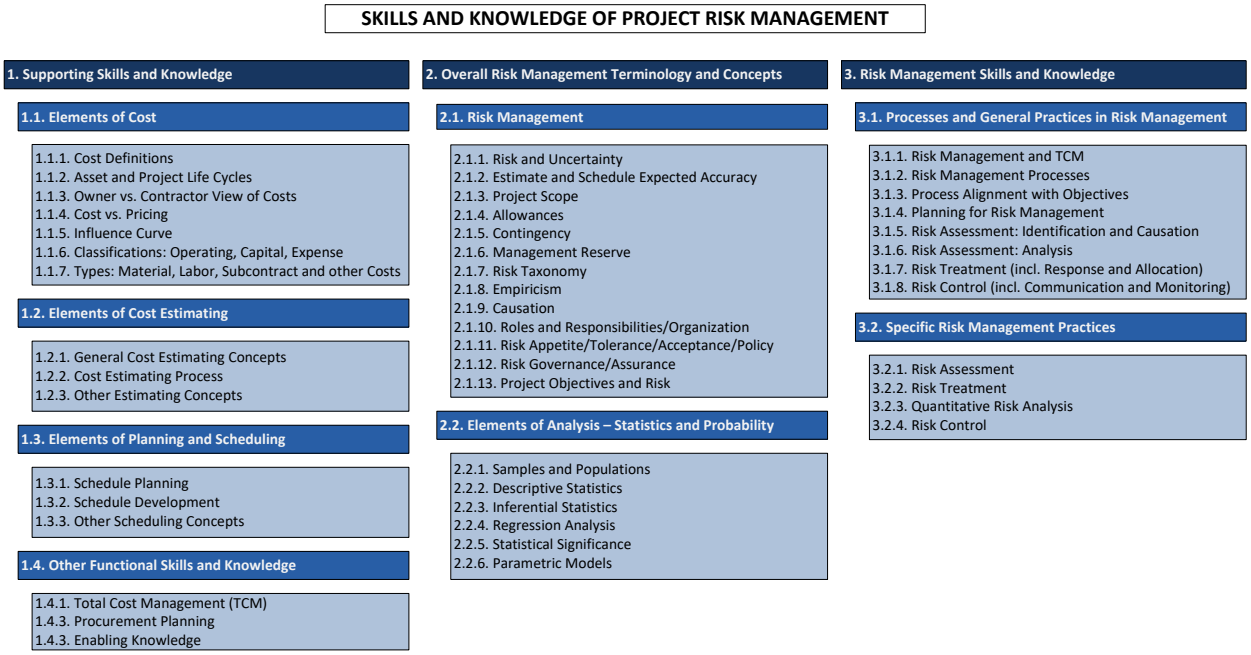

Figure 2. High Level Outline of Skills and Knowledge of Project Risk Management

A detailed table that correlates the project risk management topics and performance statements to the skills and knowledge areas described in 11R-88, *Required Skills and Knowledge of Cost Engineering* is included as an appendix. This table includes additional skills and knowledge required specifically for a PRM professional.

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APPENDIX – DETAILED OUTLINE OF SKILLS AND KNOWLEDGE OF PROJECT RISK MANAGEMENT

In the following detailed outline, a "P" in the leftmost column indicates key concepts that form the major emphasis for required skills and knowledge of project risk management; while an "S" identifies concepts with less emphasis in the examination (although not necessarily of less importance).

OUTLINE OF THE SKILLS AND KNOWLEDGE OF PROJECT RISK MANAGEMENT (P = Primary, S = Secondary)	
	1. Supporting Skills and Knowledge
	1.1. Elements of Cost
	1.1.1. Cost Definitions
S	Resources
S	Time
S	Cost
	1.1.2. Asset and Project Lifecycles
S	Lifecycle: be able to describe this term and differentiate the life cycle of an asset and a project.
	1.1.3. Owner vs. Contractor View of Costs
S	Responsibility: Be able to describe and differentiate the cost perspectives of an owner and a contractor/supplier.
	1.1.4. Cost vs. Pricing
S	Pricing
S	Be able to explain the difference between cost and pricing.
S	Price Strategy:
S	Be able to describe how business strategy and market forces may affect pricing.
S	Be able to describe from an owner or buyer perspective concerns about pricing (e.g., risks, competitiveness, cash flow).
S	Be able to describe how profit affects pricing
S	Be able to describe how profit may be determined how the different types of contracts may influence the amount
	1.1.5. Influence Curve
S	Influence: Be able to explain the concept of the influence curve.
	1.1.6. Classifications: Operating, Capital, Expense
S	Cost classifications:
S	Explain the general differences between the ways costs are classified for various cost management purposes.
S	Capital vs. Operating
S	Capital vs. Expense
S	Direct vs. Indirect
S	Fixed vs. Variable
	1.1.7. Types: Material, Labor, Subcontractor and other Costs
S	Material:
S	Material Types: Be able to describe the types and their cost drivers
S	Raw
S	Bulk
S	Fabricated
S	Engineered or designed
S	Consumables
S	Material Pricing: Be able to describe market pricing, and their influence on material costs