



استراتژی مدیریت ریسک در طول چرخه حیات پروژه (بر اساس سند مهمی از CMAA)

معرفی دوره

ارائه دهنده:

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جدید

استراتژی مدیریت ریسک در طول چرخه حیات پروژه (بر اساس تنها سند مرجع CMAA برای مدیران پروژه صنعت ساخت)



ACEMI

مقدمه

از این رو، در این دوره به بررسی و آموزش تخصصی تنها سند مرجع مدیریت ریسک که مختص پروژه‌های صنعت ساخت؛ با تمرکز بر روش‌های اجرا و تحویل پروژه (PDM)؛ بر اساس ساختار قراردادی و روابط اختصاصی کارفرما، پیمانکار، مشاور و بر اساس مراحل پروژه صنعت ساخت، از سوی انجمن مدیریت ساخت آمریکا (CMAA) در سال ۲۰۲۴ منتشر شده، می‌پردازیم و ساختار اصولی و حرفه‌ای را همراه با نمونه چکلیست‌های فنی و پروژه‌ای، مختص این صنعت آموزش می‌دهیم. مبنای مهمی که تمام مشاوران، مدیران طرح، مدیران پیمان و مدیران پروژه در تمام سازمان‌های کارفرمایی، پیمانکاری و مشاور باید آن را به شکل عمیقی فرا بگیرند و یکی از مهم‌ترین اسناد انجمن مدیریت ساخت آمریکا (CMAA) برای تایید صلاحیت مدیران پروژه در این صنعت است.

در نظر داشته باشید که این دوره در تکمیل دوره مدیریت ریسک موسسه ACEMI است و مبنای فنی پیاده‌سازی را در بر نمی‌گیرد، بلکه به حوزه فرایندی، وظایفی و استراتژیک برای پیاده‌سازی این مبنای در پروژه‌های صنعت ساخت می‌پردازد.

صنعت ساخت به دلیل پیچیدگی پروژه‌ها، عدم قطعیت‌های فراوان و عوامل متعدد محیطی، جزو پرریسک‌ترین صنایع در جهان به شمار می‌آید و این وضعیت در کشورمان حتی بحرانی‌تر است. برخی گزارش‌ها نشان می‌دهد که حدود ۷۰ الی ۹۰ درصد پروژه‌های ساخت با انواع ریسک‌های مالی، زمانی و کیفی مواجه هستند که می‌توانند نه تنها پروژه، بلکه سازمان‌های فعال در این صنعت را به ورشکستگی بکشانند.

بنابراین، مدیریت ریسک یک الزام انکارناپذیر برای پروژه‌ها و سازمان‌های فعال در صنعت ساخت است که توجه نکردن به آن می‌تواند حیات سازمان‌های فعال در این صنعت را به خطر بیندازد. اما واقعیت آن است که هر ساختار مدیریت ریسکی برای این صنعت جوابگو نیست و رویه‌هایی که در بسیاری از اسناد بین‌المللی مدیریت ریسک و به صورت عمومی برای تمامی صنایع ارائه شده از کارایی لازم در این صنعت برخوردار نیستند. نقش مدیران پروژه نیز در این بین بسیار کلیدی است و باید فرایندی استفاده شود که مختص این صنعت و پیچیدگی‌های آن طراحی شده باشد.

۵. پایش ریسک (Risk Monitoring) در پروژه‌های صنعت

ساخت

- مبانی و مفاهیم پایش ریسک
- اثر تغییر
- جلسات مدیریت ریسک در فازهای پروژه‌های صنعت ساخت
- حل و فصل ریسک‌ها
- گزارش نهایی ریسک

۶. جمع‌بندی و الحاقیه‌های پروژه‌های صنعت ساخت

- طرح برنامه مدیریت ریسک (Risk Management Plan) یا (RMP)
- نمونه چکلیست ریسک‌های پروژه در صنعت ساخت
- نمونه چکلیست ریسک‌های فنی در پروژه‌های صنعت ساخت

۱. مقدمه و مفاهیم اولیه مدیریت ریسک در پروژه‌های

صنعت ساخت

- مبانی و مفاهیم اولیه مدیریت ریسک
- نقش مدیر پروژه‌های صنعت ساخت در مدیریت ریسک
- برنامه مدیریت ریسک
- فرایند مدیریت ریسک (شناسایی ریسک، تحلیل ریسک، پاسخ ریسک و پایش ریسک)
- جلسات مدیریت ریسک در پروژه
- تخصیص ریسک
- مقیاس ریسک

۲. شناسایی ریسک (Risk Identification) در پروژه‌های

صنعت ساخت

- مبانی و مفاهیم شناسایی ریسک
- ریسک‌های منحصر به فرد (Unique Risks)
- ریسک‌های داخلی و خارجی (Internal and External Risks)
- ساختار شکست ریسک (Risk Breakdown Structure)
- فهرست طبقه‌بندی‌شده ریسک (Risk Register)

۳. تحلیل ریسک (Risk Analysis) در پروژه‌های صنعت

ساخت

- مبانی و مفاهیم تحلیل ریسک
- تحلیل کیفی ریسک در صنعت ساخت به صورت عمومی
- تحلیل پیشرفته کیفی ریسک (Advanced Qualitative Risk Analysis)
- (Risk Analysis) (احتمال، اثر هزینه، اثر زمان، اثر کیفی و اثر کلی ریسک)
- تحلیل کمی ریسک (شبیه‌سازی‌های مونت کارلو و سایر روش‌ها)

۴. پاسخ ریسک (Risk Response) در پروژه‌های صنعت

ساخت

- مبانی و مفاهیم پاسخ ریسک
- ریسک‌ها و تاریخ‌های مهم برای کارفرما
- برنامه‌های پاسخ ریسک (Risk Response Plans)
- (پاسخ‌های فرصت، تهدید و تعدیل)
- به‌روزرسانی فهرست طبقه‌بندی‌شده ریسک

آنچه خواهید آموخت

در این دوره، به صورت گام به گام، نحوه پیاده سازی مدیریت ریسک را از حوزه فرایندی و وظایفی، مختص پروژه های صنعت ساخت و از نگاه مدیران پروژه، مدیران طرح و مدیران پیمان می آموزید. مبنای که به شکل کاملاً یکپارچه با مبنای فنی دوره مدیریت ریسک ارائه می شود تا کل این نقشه در ذهنتان یکپارچه شود. در واقع موارد زیر را به صورت گام به گام فرا می گیرید:

۱. مفاهیم اولیه مدیریت ریسک در پروژه های صنعت ساخت
۲. شناسایی ریسک (Risk Identification) در پروژه های صنعت ساخت
۳. تحلیل ریسک (Risk Analysis) در پروژه های صنعت ساخت
۴. پاسخ ریسک (Risk Response) در پروژه های صنعت ساخت
۵. پایش ریسک (Risk Monitoring) در پروژه های صنعت ساخت
۶. جمع بندی و الحاقیه های پروژه های صنعت ساخت

وجه تمایز این دوره

- ارائه گواهینامه معتبر با امضای مدرس رسمی و تأیید شده انجمن مدیریت ساخت آمریکا (CMAA) در ایران
- ارائه ساختار استاندارد مدیریت ریسک به صورت اختصاصی برای پروژه های صنعت ساخت بر اساس سند مرجع برای حرفه مدیریت ساخت، شرکت های مدیریت طرح و مدیریت پیمان
- آموزش جدیدترین سند مرجع مدیریت ریسک انجمن مدیریت ساخت آمریکا (CMAA) (منتشر شده در سال ۲۰۲۴)
- متمایز سازی فراگیران به دلیل آموزش به روزترین اسناد تخصصی مدیریت ساخت در دنیا که بعضاً دسترسی به برخی از آن ها در کشور سخت و یا ناممکن است.
- ارائه ویدیوها و جزوات به صورت کامل (جزوات تنها در اختیار اعضای کانون قرار می گیرند).
- گروه پشتیبانی ۶۰ روزه از زمان شروع دوره (پشتیبانی دائمی از پنل کاربری برای اعضای کانون مادامی که عضو هستند).
- ارائه محتوا به صورت جامع، ساختار یافته و هدفمند در راستای نقشه راه CM



گواهینامه حضور

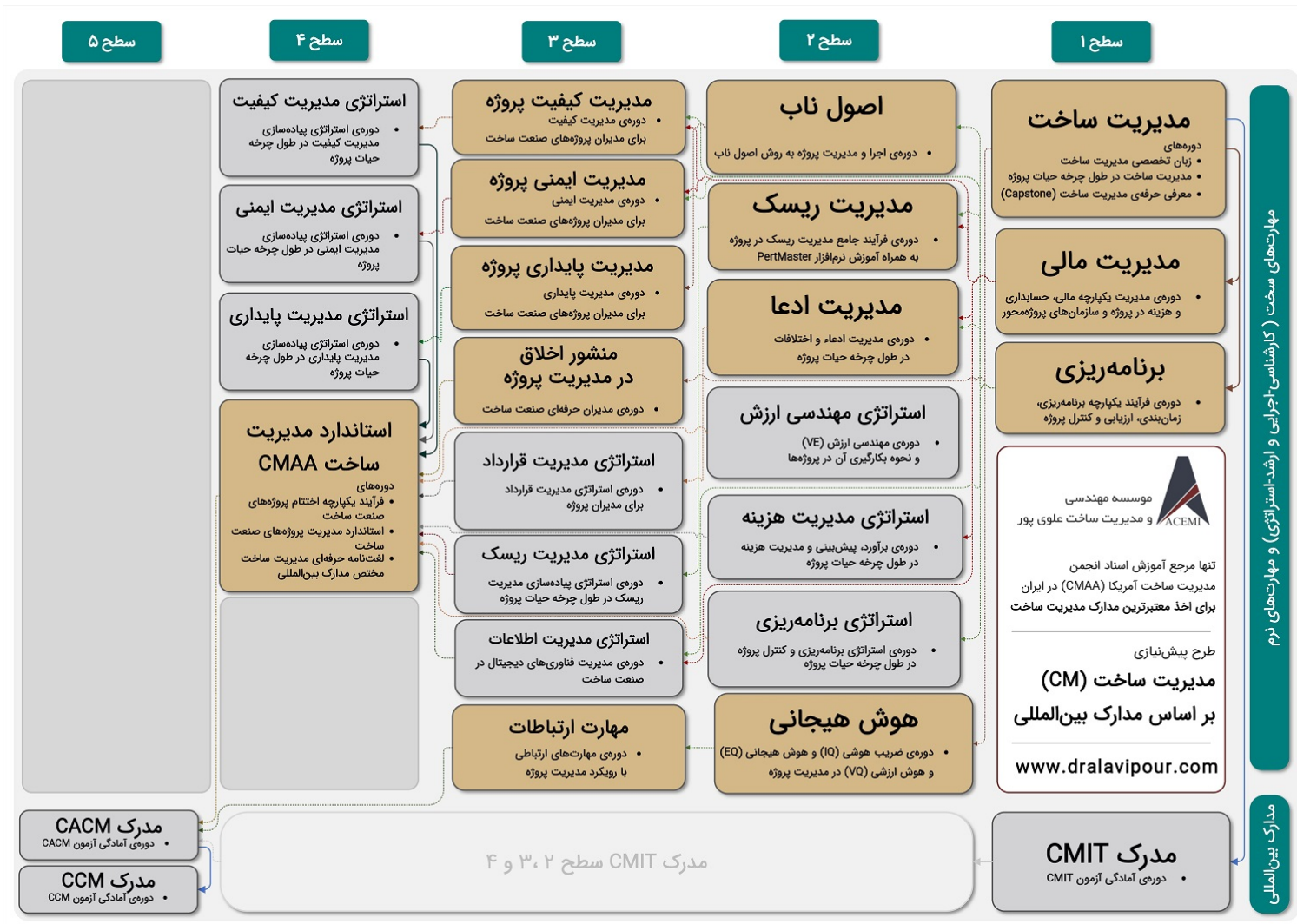
نوع: مدیریت ساخت (CM)

نوع دوره: مهارت سخت	دپارتمان: مدیریت ریسک
سطح تخصص: سطح ۳	سطح دوره: ارشد - استراتژی
مدرس: دکتر سید محمدرضا علوی پور	
پیش نیاز: فرایند یکپارچه برنامه ریزی، زمان بندی، ارزیابی و کنترل پروژه مدیریت یکپارچه مالی، حسابداری و هزینه در پروژه و سازمان های پروژه محور فرایند جامع مدیریت ریسک در پروژه + آموزش نرم افزار PertMaster	

Certifications

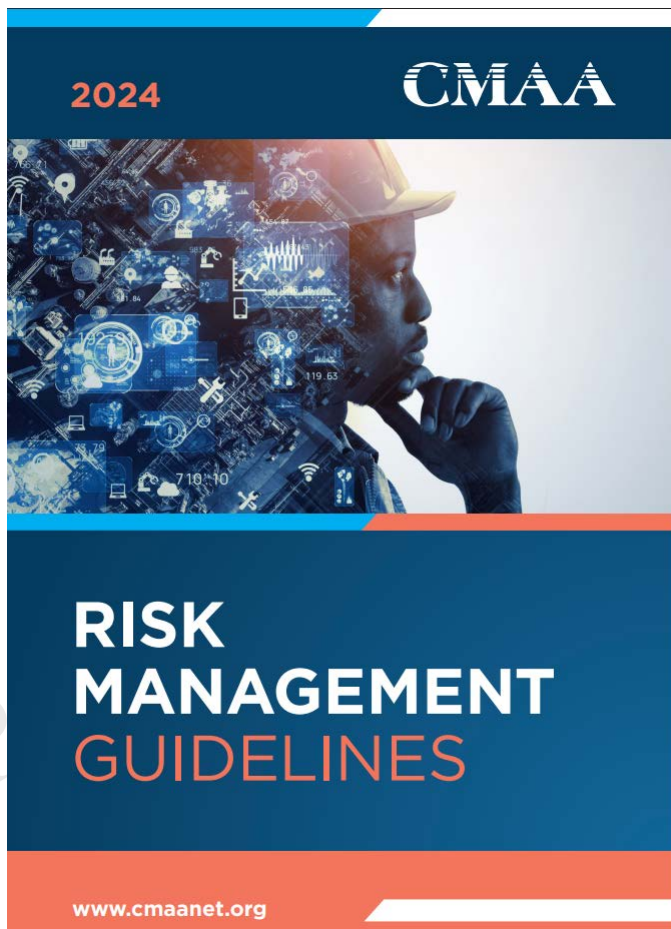
		
Certified Construction Manager (CCM)	Certified Associate Construction Manager (CACM)	Construction-Manager-in-Training (CMIT)
مدیر ساخت تاییدشده	همیار تاییدشده مدیر ساخت	مدیر ساخت تحت تعلیم
مدیر ساخت تاییدشده (CCM) استاندارد طلایی در تایید صلاحیت مدیران ساخت است. این تنها گواهینامه مدیریت ساخت است که توسط موسسه ملی استاندارد آمریکا (ANSI)، هیئت اعتباربخشی ملی (ANAB) و تحت استاندارد ISO-۱۷۰۲۴ سازمان بین‌المللی استاندارد تأیید شده است. مدیران ساخت با اخذ این مدرک صلاحیت خود را برای مدیریت پروژه‌ها و طرح‌های صنعت ساخت اعلام می‌کنند.	CACM برای متخصصانی مناسب است که قصد ادامه فعالیت در مدیریت ساخت به شکل حرفه‌ای و تخصصی‌تر دارند. این افراد باید معیارهای برنامه تایید صلاحیت مدیریت ساخت را بر اساس تحصیلات آکادمیک، تجربه اجرایی، توانمندی عملیاتی و درک مناسب از استانداردهای اجرایی انجمن مدیریت ساخت آمریکا (CMAA)، اثبات کنند. این مدرک برای افرادی مناسب است که چند سالی از سابقه اجرایی آن‌ها می‌گذرد و برای دریافت مدرک CCM آماده می‌شوند.	CMIT یک برنامه اعتبارسنجی خودآموز است که به متخصصان مدیریت ساخت کمک می‌کند تا به صورت حرفه‌ای در یک مسیر شغلی در صنعت ساخت گام بردارند و دانش و مهارت خود را توسعه دهند. این گواهینامه نشان دهنده شایستگی در تخصص مدیریت ساخت در اوایل حرفه‌ای یک فرد است. این مدرک بخصوص برای دانشجویان یا افرادی که سابقه کمی دارند مناسب است.

<https://dralavipour.com/where-to-start-ic>

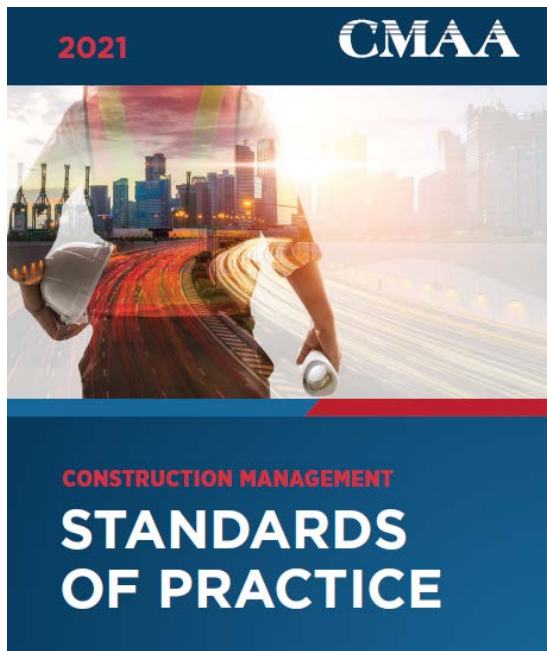


References Used in This Course

Primary references



Other references



Other references

صفحه اصلی	منوی اصلی	
مسیر متخصص شدن		
کانون دانش پژوهان		
آموزش		
انتشارات		
پایگاه دانش		
خدمات و مشاوره پروژه		
درباره ما		
رسالت‌های اجتماعی		
تماس با ما		
راهنما		

<https://dralavipour.com/publications/construction-management-standards-of-practice>

Other references

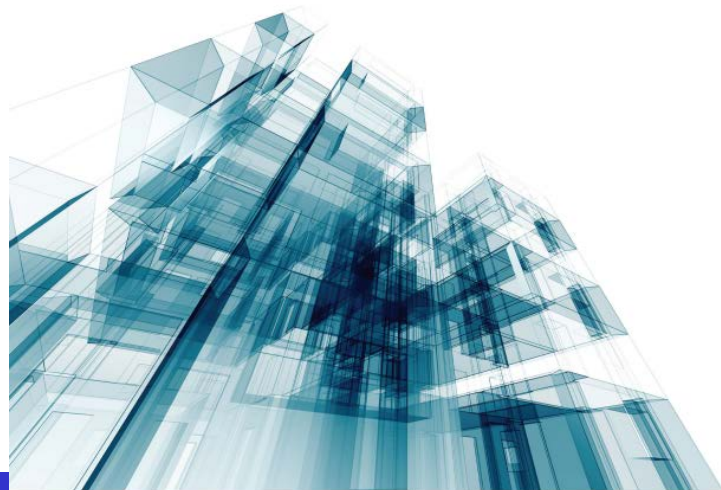
RICS guidance note



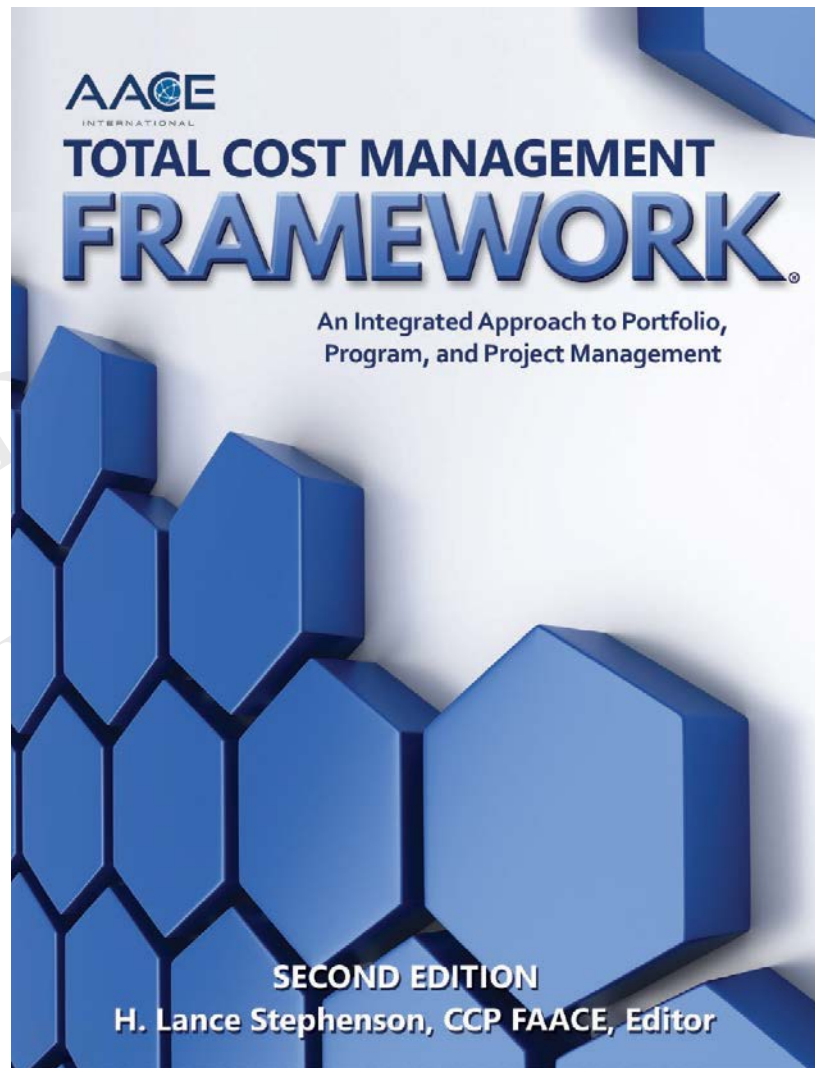
RICS professional guidance, UK

Management of risk

1st edition



rics.org/guidance





استراتژی مدیریت ریسک در طول چرخه حیات پروژه (بر اساس سند مهمی از CMAA)

بخش اول: مقدمه و مفاهیم اولیه مدیریت ریسک در پروژه‌های صنعت ساخت

ارائه دهنده:

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What we will learn?

- ☐ Introduction
- ☐ Risk Management Definitions (AACE TCM)
- ☐ The CM's Role in Risk Management
- ☐ Risk Management Plan
- ☐ Risk Management Process (AACE TCM)
- ☐ Risk Management Process (CMAA)
- ☐ Risk Meetings
- ☐ Risk Allocation
- ☐ Scale

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Introduction

Introduction

❑ These Risk Management Guidelines **supplement** the CMAA Construction Management Standards of Practice and provide **practical guidance** for the construction manager (CM) to

1. Identify,
2. Analyze,
3. Respond to, and
4. Monitor

risk from project/program **conception** to **post-occupancy**.



Introduction

- ❑ This document uses the term “**CM**” to refer to project management and program management professionals who **lead teams** to deliver projects/programs in the built environment.



Introduction

❑ This document intends to **prescribe** an industry standard of practice which the CM will **meet** or **exceed**,
regardless of

1. The delivery method,
2. Owner,
3. Location, or
4. Type of project/program (renovation vs. New construction, horizontal vs. Vertical, small vs. Large, etc.).



Introduction

❑ For simplicity, these Guidelines refer to **five delivery phases**:

pre-design, design, procurement, construction, and post-construction.

❖ However, on an **actual project/program**, these phases may not have clear start and end points.

✓ Activities **may overlap** between phases or occur in a different order.





Introduction

□ Note that

1. CM **may deliver services** throughout all project or program phases, or
2. CM may **only be involved** with one phase, e.g., the construction phase.

What the CM should do if joins in the later phase?

Introduction

- ❑ If the **CM** joins the team in a later phase,
the CM may **need to apply** management concepts from **earlier phases**,
if those **services** are in the **CM's agreement** with the owner.

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Introduction

- ❑ Accordingly, the **CM** must **tailor** the **details** provided in this document to **fit** the needs of a particular project/program and the CM's scope of services.
- ❑ **Not every project/program** will require every service, and a **particular project/program** may require **unique services not listed** in this document.
- ❑ **Whatever** service the CM provides, **this manual** provides **details** for providing risk management services but does **not define** a CM's scope of services, as those services are **specific to the CM's agreement** with the owner.



Introduction

- ❑ **CMAA's other publications** address specific guidance in cost management, time management, quality management, contract administration, sustainability, etc.

Definition of risk?

❑ A risk is an uncertain

1. Event or
2. Condition

with the **potential** to **impact** a construction project or program
negatively or positively.



1. A negative risk is a **threat**, which has the potential for loss, damage, or any other undesirable event.
2. A positive risk is an **opportunity**, which has the potential to reduce costs, save time, or improve quality.

- ❑ A risk can be defined as an uncertain event or **circumstance** that, if it occurs, will **affect the outcome** of a programme/project.

Some alternative risk definitions:

Risk definitions
'The likelihood of an event or failure occurring and its consequences or impact' [NRM1, RICS, 2012]
'Risk is a possible future event combining the probability or frequency of occurrence of a defined threat or opportunity and the magnitude of the consequences of that occurrence' [IEC Guide 73:2002, British Standard, 2002].
'An uncertain event or set of circumstances that should it or they occur would have an effect on the achievement of one or more of the project objectives' [APM Body of Knowledge, APM, 2006].
'Uncertainty of outcome (whether positive opportunity or negative threat). It is the combination of the chance of an event and its consequences' [Management of Risk: Guidance for Practitioners, OGC, 2002].
'Uncertainty of outcome (whether positive opportunity or negative threat)' [The Orange Book Management of Risk - Principles and Concepts, HM Treasury 2004].

RICS guidance note



RICS professional guidance, UK
Management of risk
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What is risk management?

Risk management

- ❑ Risk management involves **methodical management processes** designed to
 - ❖ **Reduce** the negative impact of threats and
 - ❖ **Realize** the positive impact of opportunitieson a project's/program's scope, cost, schedule, and quality requirements.

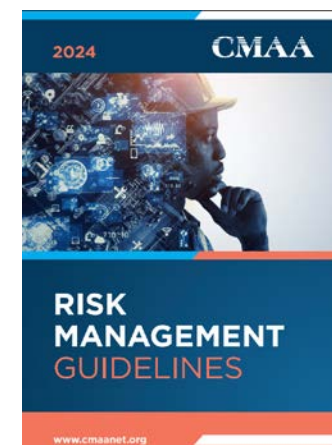


Risk management

❑ Risk management is a **continuous** process throughout **all phases** of a construction project or program to

1. Identify,
2. Analyze,
3. Respond to, and
4. Monitor

threats and opportunities.



Risk management

- ☐ Risk identification is when a team **evaluates** a **project/program** to **discover** its potential threats and opportunities.
- ☐ **After** a team **identifies** threats and opportunities, they analyze those risks' potential **impacts** to the project or program.
- ☐ Teams may respond to threats or opportunities through design, engineering, or management decisions.
- ☐ Finally, the team should continuously track **risks** throughout the entire project or program.

Difference between risk and crisis management?





Risk management

¹Note that risk management is not identical to crisis management. Risk management is proactive. Risk management attempts to identify, analyze, respond to, and monitor negative and positive events before they occur. Meanwhile, crisis management is reactive to negative events. Crisis management is typically a response to an unforeseen negative event during or after the event.



Risk management

❑ **Risk management** ideally begins in the pre-design phase and continues throughout **all phases**,

particularly on **larger and more complex** projects and programs.

❑ **All construction plans** are based on **estimates** containing uncertainty, so projects/programs should include adequate contingency in

budgets and **schedules** to respond to risk.

❑ The **sooner** the team **starts managing risk**, the **greater** the potential value to the owner and the project/program.

❑ **Early planning** can help teams

1. reduce or eliminate threats' impacts and
2. maximize opportunities' benefits.



Focus on owner's needs

- ❑ Note that the team's risk management processes should **reflect** the project's or program's overall requirements.
- ❑ **Those requirements** might be **more complex** than budget and schedule performance (e.g., the owner may have requirements for quality, sustainability, procurement, etc.).
- ❑ The **team should remember** the owner's intent and **maximize** the benefits that the **owner is trying to achieve**, **not focus only** on the budget and schedule.



- ❑ For simplicity, this document refers to **five delivery phases**: pre-design, design, procurement, construction, and post-construction.
 - ❖ However, on an actual project/program, these phases may **not have clear start and end** points.
 - ❖ Activities may overlap between phases or occur in a different order.
- ❑ A **construction manager (CM)** is a management professional who **leads teams** to deliver projects and programs in the built environment.
- ❑ On an actual project/program, the CM may **join the team** in a later phase and need to **apply concepts** from **earlier phases**.



Risk Management Definitions

(AACE TCM)

Description

❑ Risk management is a systematic and iterative process comprising four steps:

1. **Plan** - to establish risk management objectives;
2. **Assess** - to identify and analyze risk;
3. **Treat** - by planning and implementing risk responses; and
4. **Control** - by monitoring, communicating and enhancing risk management effectiveness.

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Description

❑ The **risk management process** is applied in **conjunction** with the **other asset and project control planning processes** such as

1. Scope development,
2. Cost estimating,
3. Schedule planning,
4. Schedule development,
5. Resource planning,
6. Procurement planning and
7. Financial systems integration.

Description

- ☐ In the context of **TCM's strategic asset management process**, the term **enterprise risk management (ERM)** recognizes that the risk management process should be applied to
1. overall enterprise,
 2. portfolio and
 3. program level objectives,
- not to just a single business unit, asset or project.

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Description – The definition debate

- ❑ To be an **effective facilitator** of the risk management process, professionals should be aware of the **two major issues** on which this **debate** centers.

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Description – The definition debate

❑ First is the issue of risk versus uncertainty.

❖ The controversy here concerns

1. How far we should be trying to **manage uncertainty** or
2. Whether we **must restrict** our efforts to **managing risk**.

❖ The economist Frank H. **Knight** in his work Risk, Uncertainty, and Profit (1921), made a **distinction** between risk and uncertainty when he argued that

“...measurable uncertainties do not introduce into business any uncertainty whatever.”

- ✓ For Knight, measurable uncertainty was not true uncertainty.
 - o To describe measurable uncertainty he assigned the term risk.

Description – The definition debate

❑ Knight's view should be **balanced against** the views held by **mathematicians long before him** such as Poisson, Bernoulli and Bayes.

❖ They referred to

1. **Uncertainty as measurable** in terms of quantified probabilities and

2. Did **not distinguish** between uncertainty and risk.

✓ This can help explain **why economists** may choose to **define** uncertainty and risk **differently** from mathematical purists.

Description – The definition debate

- ❑ Since **AACE chooses** to frame risk in terms of its **effect on business goals** or project objectives,

we are **not concerned** with non-quantitative uncertainty

but **simply risk** that matters.

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Description – The definition debate

- ❑ Second is the question of positive or upside risk, commonly called opportunity (as opposed to negative or downside risk, commonly called threats).
- ❖ **Traditionally**, risk was considered to only have an **adverse, harmful or negative** impact on objectives (and it still has in many quarters).
- ❖ In the **1960s**, risk management began to be recognized as an **essential management skill**
but **at that time** organizations tended to focus on insurance management, seeking to maintain **financial capacity** following the **negative effects** of adverse events.

Description – The definition debate

- ❑ A **broader view** began to emerge in the **1970s** as organizations developed a **better understanding** of the nature of risks and sought **alternatives to insurance**, however, the focus **remained on overcoming negative effects**.
- ❑ In recent years, more and more organizations have spoken of risk management in a broader sense where the intent is to
 1. **Proactively reduce** the impact of **negative** threats and
 2. **Increase** the probability of **positive opportunities**.



Description – The definition debate

- ❑ **Listed below** is a selection of definitions to help appreciate the **differing views** currently held by some of the **more renowned professional groups** who are **shaping best practice** in this discipline:

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Description – The definition debate

1. “An ambiguous term that can mean any of the following:

- 1) all uncertainty (threats and opportunities);
 - 2) undesirable outcomes (uncertainty = risks + opportunities); or
 - 3) the net impact or effect of uncertainty (threats - opportunities).
- ❖ The convention used in any work should be clearly stated to avoid misunderstandings”.

[Ref. AACE Risk Management Dictionary, 1995]

Description – The definition debate

2. “Combination of the probability of an event and its consequence.”

- ❖ Note: 3.1.1-1, The term “risk” is generally **used only when** there is **at least** the **possibility** of **negative** consequences.
- ❖ Note: 3.1.2-2, Consequences can range from **positive** to **negative**.
 - ✓ However, **consequences** are **always negative** for safety aspects.

[Ref. PD ISO/IEC Guide 73:2002].

Description – The definition debate

3. “The chance of something happening that will have an impact on objectives.”

- ❖ Note 1: A risk is often specified in terms of an **event** or **circumstance** and the **consequences** that may flow from it.
- ❖ Note 2: Risk is measured in terms of a **combination** of the consequences of an event and their likelihood.
- ❖ Note 3: Risk may have a positive or negative impact.

[Ref. AS/NZS 4360:2004].

Description – The definition debate

4. “Uncertainty **inherent in plans** and the **possibility** of something happening (i.e. a **contingency**) that can affect the prospects of **achieving business or project goals**.”

[Ref. BS 6079-3:2000].

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Description – The definition debate

5. “An **uncertain event** or **set of circumstances** that, should it occur, will have an **effect on achievement** of one or more of the **project’s objectives**.”

[Ref. APM PRAM Guide 2004].

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Description – The definition debate

6. “**Uncertainty** presents both **risk** and **opportunity**,
with the **potential** to erode or enhance **value**.”

[Ref. The Committee of Sponsoring Organizations of the Treadway Commission’s (COSO’s) Enterprise Risk Management - Integrated Framework, 2004].

Description – The definition debate

7. “An **uncertain event** or **condition** that, if it occurs,
has a **positive** or **negative** effect on a **project objective**.”

[Ref. PMI® PMBoK® Third Edition, 2004].

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Description – The definition debate

8. An **uncertain event** or **set of circumstances** that, should it **occur**, will have an effect on **achievement** of **one or more** of the project's objectives.
[Ref. Management of Risk: Guidance for Practitioners (Published by TSO (The Stationery Office – UK Office of Government Commerce)].

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Description – The definition debate

9. **Project risk** may be defined simply as the **possibility** of an unintended future event with **potential** undesirable consequences.

[Ref. National Research Council (US), The Owner's Role in Project Risk Management, The National Academies Press, 2005].

Description – The definition debate

10. Risk refers to uncertainty of **outcome**,

whether positive opportunity or negative threat, of actions and events.

❖ It is the **combination** of likelihood and impact, including perceived importance.

[Ref. Risk: Improving government's capability to handle risk and uncertainty, Strategy Unit Report, November 2002 (UK Cabinet Office)].

Description – The definition debate

11. A **measure** of future uncertainties in **achieving** program performance **goals** within defined cost and schedule constraints.

❖ It has **three components**:

1. a future root cause,
2. a likelihood assessed at the present time of that future root cause occurring,
and
3. the consequence of that future occurrence.

[Ref. Risk Management Guide for DOD Acquisition,
Sixth Edition (Version 1.0) August, 2006].

Description – The definition debate

12. Risk = f(hazard, safeguard)

[Ref. Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Harold Kerzner, Ph.D., John Wiley and Sons Tenth Edition, 2009].

❖ Also “**Future events** (or **outcomes**) that are **favorable** are called opportunities, whereas **unfavorable** events are called risks.”

[Ref. Project Management, Harold Kerzner, Ph.D., Fifth Edition 1995, Van Nostrand Reinhold].

Description – The definition debate

13. The probability and magnitude of a **loss**, **disaster**, or **other undesirable event**.

[Ref. The Failure of Risk Management: Why It's Broken and How to Fix It, Douglas W. Hubbard, John Wiley and Sons, 2009].

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Description – The definition debate

14. The **chance of things not turning out as expected.**

[Ref. <http://www.economist.com/research> 2010].

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Description – The definition debate

15. The potential for realization of unwanted, adverse consequences to human life, health, property, or the environment.

[Ref. The Society for Risk Analysis, www.sra.org].

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Description – The definition debate

- ❑ It may be noted that AACE is **neutral** in respect to threat and opportunity.
 - ❖ However, with this in mind, the **risk professional** should be aware that,
although it may be **tempting** to consider the **treatment** of threat and opportunity as **separate activities**,
in practice they are **seldom independent**.
- ❑ The AACE recommended risk management processes adopt a **progressive interpretation** of this definition by managing **both threats and opportunities in parallel**.

Description – Definition of risk

❑ For the **purpose** of the risk management process within the TCM process, **risk** can be defined as follows;

- ❖ An **uncertain** event or condition that could affect a project objective or business goal.

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Description – Decision and risk analysis

- ❑ The **full risk management process**, as mapped in this section, is designed for **addressing uncertainty in project outcomes** (from a project control context).

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Description – Risk management versus value management and value improving practices

- ❑ As defined, value management in TCM is a process employed by an enterprise to help **ensure that** its assets provide or maintain the usefulness and/or value required by the stakeholders.

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Description – Risk management versus value management and value improving practices

- ❑ Risk management is considered a value improving practice because it helps **increase** the **probability** that a **planned asset or project** achieves its **optimum potential** (as stakeholders would require).
- ❑ As discussed, it is recommended that **risk management processes** manage both threats and opportunities in **parallel**.
- ❑ **One way to accomplish** this is have separate but integrated risk and value management processes to ensure that both threats and opportunities get all due attention.

The CM's Role in Risk Management

The CM's role in risk management

- ❑ Risk is **part of any business**, so a **CM may provide** risk management services to the owner (or client) to identify, analyze, respond to, and monitor risks on capital projects and programs.



However, the CM's risk management responsibilities may vary greatly, so the CM must tailor the details provided in this document to fit the owner's needs, the owner's risk tolerance, and the CM's **scope of services**. Not every project or program will require every service listed in these *Guidelines*.

The CM's role in risk management

- ❑ **Some owners** may also require **unique services** not listed here.
- ❑ Risk management services should also be **scaled to fit** the project's/program's size, budget, complexity, etc.
- ❑ **Whatever services** the CM provides, this course provides **details** for providing risk management services which a CM should **reference** throughout all project or program phases.



A CM must always understand the risk management process well enough to recognize risks which apply to the current project/program and ensure that the team identifies, analyzes, responds to, and monitors risk appropriately.

The CM's role in risk management

❑ In other words,

if the CM is not directly **responsible** for managing risk, the CM **must still**

1. **Be aware** of the project's/program's risks and
2. **Ensure** that the **team follows** good risk management **processes**.

❑ If the CM's **agreement** with the owner includes **risk management services**,
the CM should

1. **Thoroughly understand** the applicable risks and
2. **Competently lead** the team's risk management processes.

The CM's role in risk management

1. A **CM** may act as the team's risk manager, or
 2. The **team may** have a designated risk specialist to manage risk.
 - ❖ The CM or risk specialist **who fills** the risk manager role
 1. **Must be** a risk expert and
 2. **May hold** additional risk credentials, such as a **professional certification**.
- ❑ A **dedicated risk specialist** is common on larger and more complex projects and programs.
- ❖ However, **some owners** may require a separate risk specialist on **all their** projects and programs, regardless of the size or complexity.

The CM's role in risk management

- ❑ Risk managers should be as **impartial** as possible.
 - ❖ As a **best practice**, risk managers may be a separate entity from the designer, builder, and other important stakeholders so that they may **operate independently** from the rest of the team.
- ❑ If the risk manager does **not** have **independent authority**,
other team members or stakeholders **may influence the risk manager** to
 1. Provide an **overly optimistic** opinion or
 2. Focus on **one entity's risks** more than others.

The CM's role in risk management

❑ For example,

if the CM is the **risk manager** and the CM is in an **at-risk agreement** with the owner (i.e., the CM is responsible for all aspects of construction delivery),

the CM at-risk (CMAR) may be **overly optimistic** about their own work.

❖ **Even if the CMAR is realistic**, the CMAR

❖ **Still faces significant risk** and

❖ **May have an incentive to focus on their own risks **more than other** stakeholders' risks.**

❑ In this example, it may be in the owner's best interests to hire a separate, independent risk manager instead to manage the team's risk.

Risk Management Plan

Risk management plan

- ❑ **Risk management** requires an effective risk management plan (RMP) that defines the team's **risk management process**.
- ❑ **Teams** should **develop** and **implement** RMP as **early as possible** to deal with risk's uncertainty and potential consequences.
- ❖ The **RMP** may be part of
 1. project management plan (PMP),
 2. program management plan (PgMP), or
 3. separate document that the PMP/PgMP references.



Risk management plan

❑ The plan

1. **Explains** the risk management processes,
2. **Identifies** their purposes, and
3. **Sets** performance objectives.
 - ❖ In other words, the RMP should **describe**
 1. The **owner's risk requirements** and
 2. **How the team** will **perform** risk management processes.
4. **Defines** key risk terminology
5. **Establishes** specific policies for identifying, analyzing, responding to, and monitoring potential **threats** and **opportunities**.
6. **Establishes** that risk meetings will occur throughout all phases.
 - ❖ These meetings help the team manage the risks that are most important to **each phase**.

Risk management plan

❑ The RMP **must define** or **list** the following:

- ❖ Purpose: The reason why risk management is important to the project/program;
- ❖ Roles and Responsibilities: An organization chart identifying the people responsible for managing risk by name and title, including their relationship(s) to other team members;
- ❖ Risk analysis thresholds and contingency: Any value thresholds which require a formal risk analysis to determine an appropriate contingency and related processes to develop and use the contingency;
- ❖ Risk management budget: Documentation of any funds for risk management, such as travel costs for meetings, software costs, or third-party consultant fees;

Risk management plan

❑ The RMP **must define** or **list** the following:

- ❖ Risk meeting structure: The meeting times, frequency, required attendees, and goals for any risk meetings, which may happen more often on larger projects/programs and in later phases;
- ❖ Risk reporting requirements: The content, distribution list, format, and frequency of reports to internal stakeholders;
- ❖ Version history and approvals: Documentation of all changes from previous versions to the current version, which may require concurrence from all team members, especially the owner.



Risk management plan

- ☐ The RMP is **project- or program-specific**.
- ☐ The outline in appendix is **only an example**.
- ☐ This example may **not necessarily** reflect the **owner's specific requirements**.
- ☐ If
 1. the CM is the **risk manager**,
the CM **must customize** the RMP to the specific project/program and owner's requirements.
 2. the CM is **not the risk manager**,
the CM should **still**
 1. **understand** the project's/program's unique, applicable risks and
 2. **monitor** the team's risk management processes.



Risk management plan

1. Version History and Approvals
2. Introduction – RMP Purpose – Key Terms

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Risk management plan

3. Policies and Organization

- ❖ Roles and Responsibilities
- ❖ Risk Management Budget
- ❖ Tools
- ❖ Analysis Thresholds
- ❖ Meeting Structure
 - ✓ Schedule
 - ✓ Required Attendees
 - ✓ Objectives – Reporting Requirements ◦ Report Content and Format ◦ Distribution List ◦ Frequency

Risk management plan

4. Risk Management Procedures

- ❖ Risk Identification
- ❖ Risk Analysis
 - ✓ Qualitative Analysis
 - ✓ Quantitative Analysis
- ❖ Risk Response Planning
- ❖ Risk Monitoring

5. Risk Resolution

6. Final Report

Risk management plan

- ❑ The CM or risk specialist should **draft** an **RMP** as part of delivering risk management services.
- ❑ An **RMP** should be project- or program-specific.
- ❑ The CM or risk specialist may
 1. **Customize a template** based on the owner's particular needs or
 2. Write the **entire RMP**.
- ❖ Regardless, an RMP's length and complexity should be appropriate for the project/program.
 - ✓ For example, the RMP on a **small project** with relatively **simple risks** may be a **few short paragraphs** in the PMP.
 - ✓ Meanwhile, a **large program** may require a separate, detailed, and lengthy RMP.

Risk management plan

- ❑ Even if the CM is **not responsible** for providing risk management services, the CM **should advise** the owner to have an RMP that is appropriate for the project or program.
- ❖ A CM **should explain** to the owner that an **RMP helps** the team **focus on risk across** the full project/program **lifecycle**.

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Risk management plan

- ❑ An RMP's benefits include (but are not limited to):
 - ❖ A reduction or avoidance of losses;
 - ❖ Better preparation for opportunities;
 - ❖ Clarification of the team members' roles and responsibilities for risk;
 - ❖ Clear communication protocols concerning risk;
 - ❖ Formal documentation of the risk management process;
 - ❖ Greater risk awareness, leading to improved resource allocation;
 - ❖ Improved contingency management;
 - ❖ Transparency for all stakeholders on the potential impacts of risk; and
 - ❖ Transparency for team members, particularly for risk meetings and any required deliverables.

Risk management plan

- ❑ Finally, the **risk manager (the CM or a risk specialist)** should **update** the **RMP** as **needed throughout** all project/program phases.
- ❑ As a project or program progresses, **risk events** may occur or fail to occur which **change** the team's risk environment.
- ❑ With the **owner's approval**, the **risk manager modifies** the RMP to reflect any **necessary changes**.
 - ❖ For example, the **latest version** of the RMP should reflect **any changes** in team members' roles, frequency of meetings, and risk management budget.
- ❑ If the **CM is not the risk manager**,
the CM **must still verify** that the RMP is up to date and understand any changes.

Risk Management Process

(AACE TCM)

Process map for risk management

- ❑ The risk management process is iterative, centering on steps that
 1. Establish objectives,
 2. Identify risk drivers occurring throughout the project or asset life-cycle, and
 3. Essentially manage that risk by continually seeking to assess, treat and control their impacts.

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Process map for risk management

❑ The **primary outputs** of the risk management process are:

1. the risk management plan;
2. the risk register;
3. risk analyses (including contingency allowances for cost and schedule);
4. risk response plans; and
5. the baseline project scope definition.

Figure 7.6-1 is the TCM process map for risk management.

Process map for risk management

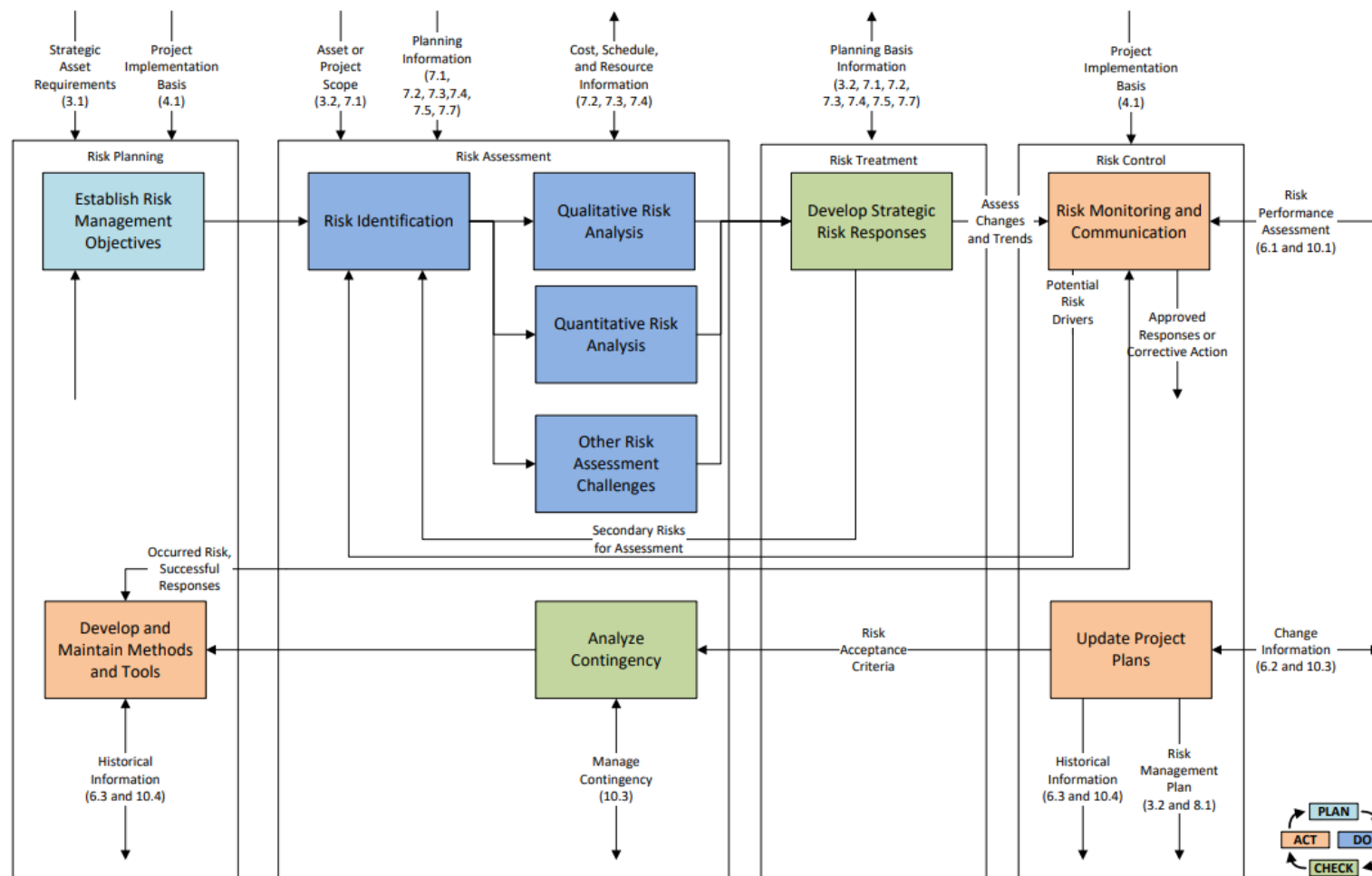


Figure 7.6-1 Process Map for Risk Management

Risk planning

☐ Leadership must

1. liaise with stakeholders **at all levels** and
2. use the **risk management plan** to
establish the **scope of risk management**.

☐ This will help clarify **expectations** and ensure all **parties are aligned**.

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Risk planning

❑ For example:

- ❖ Are there any preferred methods or practices?
- ❖ Are there preferred metrics and/or report formats?
- ❖ Does the operational definition of risk support the specific process and methods being used?
- ❖ How frequently will the team be expected to meet and update their qualitative analyses? Each month or at different periodic intervals?
- ❖ How frequently are cost and/or schedule risk analyses to be run? Each quarter or at agreed milestones?

Risk planning

❑ For example:

- ❖ Is there a predetermined budget or an estimated number of hours that can be expended in support of the risk management process?
- ❖ Alternatively, is this venture unique requiring special consideration?
- ❖ Are there any assumptions that need to be formalized? (E.g. the entire contractual chain may, at some point, be expected to support the implementation of risk response plans).

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Risk planning

❑ **Roles and responsibilities** should also be identified; this may include

1. A risk champion to lead the risk management initiative at **project level**,
2. A risk study team to complete the **initial risk identification** and
3. A review committee to **complete periodic** monitoring and risk control.

❖ Such **review committees** are typically at the **project level** but, **more frequently**, organizations are utilizing independent groups to fulfill an additional **parallel oversight** and/or **audit function**.

Risk planning

❑ The **objective** may be expressed in terms of risk appetite and risk tolerance.

❖ **Risk appetite** can be **described in terms of**

a confidence interval or confidence level

e.g., **percentage confidence** of underrun or P value.

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Risk planning

❑ The **objective** may be expressed in terms of risk appetite and risk tolerance.

❖ **Risk tolerance** for example, could be described by **using**

1. a simple threshold or
2. range of +/- number of days and/or
3. range expressed using the agreed project currency (or currencies).

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Risk planning

- ❑ **Depending** on client needs or expectations it may, for example, be necessary to consider **other risk consequences** such as
a **reasonable number** of safety and/or environmental incidents.

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Risk planning

- ☐ Risk management is **applicable** to all enterprises and all asset or project life cycle stages.
- ☐ The **four iterative steps**,
planning, assessment, treatment and control
are **initially applied** in a phased manner consistent with the project
scope development phases described.

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Risk planning

- ❑ During planning, it is especially important to **understand** the **synergies** between value engineering and risk management.
- ❖ Changes to plans to address value issues **may affect risk**, and vice versa.
 - ✓ Therefore, as indicated in the process map,
the value engineering and risk management processes generally need to be revisited together.

Risk planning

❑ **Diversity** of the risk management team is **strongly encouraged**, with participation by all stakeholders and end users.

❖ However, risk management success is so **closely linked** to the other strategic asset and project processes that it is best **facilitated** by having experienced management personnel coordinate it.

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Risk Management Process

(CMAA)

Risk management process

- ❑ Teams in the built environment face many **dynamic** threats and opportunities throughout all delivery phases.
- ❖ Risks can **change** and **new risks** can emerge as a project or program moves into later phases.
 - ✓ *Examples include differing site conditions, market changes, new technologies, scope changes, the public's perception of the project or program, and weather.*
 - The **potential consequences** of these risk events include **changes** in cost, schedule, and quality, which all affect successful delivery.

Risk management process

- ❑ Therefore, a CM must understand that risk management is a **continuous process** to identify, analyze, respond to, and monitor threats and opportunities **throughout all phases** on a construction project or program.
- ❖ Risk management processes are **iterative** and must **repeat at regular intervals** throughout the entire project or program.
 - ✓ The CM should **understand** and **participate** in risk management processes throughout all phases, **even if** the team is using a **separate risk specialist**.

Risk management process



Risk management process

- ❑ **Continuous risk management** begins as early as possible (ideally during the pre-design phase) and follows the **processes defined in the team's RMP**.
- ❑ **Integrating** a continuous risk management process will:
 - ❖ Focus the team on the project's/program's requirements and constraints;
 - ❖ Improve consensus;
 - ❖ Increase the probability that the team will meet the owner's cost, schedule, and quality requirements; and
 - ❖ Reduce the number of surprises.

Risk identification

❑ **Risk identification** is **when** a team evaluates a project/program to **discover** its potential threats and opportunities.

❖ These risks relate to scope, cost, schedule, and quality.

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