

AACE
INTERNATIONAL
**RECOMMENDED
PRACTICE**

70R-12

**PRINCIPLES OF SCHEDULE
CONTINGENCY MANAGEMENT -
AS APPLIED IN ENGINEERING,
PROCUREMENT, AND
CONSTRUCTION**

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AAACE® International Recommended Practice No. 70R-12

PRINCIPLES OF SCHEDULE CONTINGENCY MANAGEMENT – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION

TCM Framework: 7.2 – Schedule Planning and Development
7.6 – Risk Management

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Note: As AAACE International Recommended Practices evolve over time, please refer to www.aacei.org for the latest revisions.

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Disclaimer: The opinions expressed by the authors and contributors to this recommended practice are their own and do not necessarily reflect those of their employers, unless otherwise stated.

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PURPOSE

This recommended practice (RP) describes schedule contingency implementation and schedule risk management techniques to consider when developing a capital construction project execution phase schedule. AACE International recommended practices are intended to provide guidelines, not to establish standards. This RP describes general principles for applying schedule contingency in engineering, procurement and construction project schedules.

Although this RP was written as a stand-alone document it can be used as a companion with the AACE recommended practices related to schedule planning and development, risk management, forecasting, and change management. Overlapping information has been eliminated from this document in deference to the more detailed guidelines in the other RP documents.

INTRODUCTION

There are a wide range of opinions regarding whether or not to allow the use of schedule contingency. This RP reflects the general consensus concerning guidelines for the proper use of schedule contingency when schedule contingency is allowed to be used.

Because the application of schedule contingency is not an area of generally accepted practice, this RP is focused on describing the schedule contingency definition, attributes and principles that professionals can generally consider for application. This RP excludes discussion of schedule risk modeling processes and analysis as well as the integrated cost and schedule risk analysis. It also excludes the detailed procedure for managing contingency through change management and other project cost/schedule control methods. AACE recommended practices have been developed to provide detailed guidelines for those related processes.

This RP describes guidelines for implementing schedule contingency as part of the overall capital project risk management process when schedule contingency is desired. These principles may be applied to any phase of a project, but become more relevant at the time of planning for project control during the execution phase. After analysis of schedule risks on the established schedule model, the project team should plan the methods to establish time contingency in the project schedule logic, and describe these procedures in the project execution and control plans.

SCHEDULE CONTINGENCY DEFINITION

Schedule contingency is defined as an amount of time included in the project or program schedule to mitigate (dampen/buffer) the effects of risks or uncertainties identified or associated with specific elements of the project schedule. When applying this definition, the generally accepted attributes of schedule contingency are as follows:

- Schedule contingency must be visible in the schedule.
- Schedule contingency is time only and does not contain scope, resources or costs.
- Schedule contingency is only established based upon an analysis of schedule risk.
- Schedule contingency is not float (i.e. neither project float nor total float).

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- Schedule contingency is not lag/lead (relationship durations).
- Schedule contingency is not hidden artificial lengthening of schedule activities.
- Schedule contingency is not the improper use of what some term as “preferential logic”.
- Schedule contingency is not a non-work period in the software calendar.
- Schedule contingency is not management reserve.

There are other terms often used interchangeably for schedule contingency. The term *schedule buffer* originated in Critical Chain Theory (CCPM) and has been used interchangeably by practitioners to mean schedule contingency. The term *schedule margin* is related to production scheduling and *is time for unforeseen conditions, such as imprecise production rates, material shortage, etc.* Schedule margin is used and increasingly required in aerospace and defense (A&D) schedules.

Schedule management reserve (SMR) is a designated amount of time to account for risks that cannot be quantified and/or managed with contingency; or to allow time for management purposes and the use of management reserve generally requires a formal baseline change.

COST AND SCHEDULE CONTINGENCY LINK

Schedule contingency shares certain attributes with cost contingency. Both are typically established using statistical analysis or judgment based on past asset or project experience. Both cost and schedule estimates are by definition uncertain and there is general agreement that the uncertainty should be explicitly addressed in project planning. Cost contingency by definition is expected to be expended while schedule contingency may also serve a risk mitigation role (i.e., time buffering).

As a rule of thumb, when there are contingency costs added to the project estimate, there most likely is an element of time contingency. Conversely, most project risks that affect schedule durations also affect costs. Contingency estimating methods that link risk drivers and cost/schedule outcomes are described in AACE Recommended Practice No. 40R-08, *Contingency Estimating – General Principles*. Practitioners should refer to AACE’s RPs on risk analysis and contingency estimating for additional guidance.

Contingency usually excludes major scope changes such as changes in end product specification, capacities, facility sizes and/or the location of the asset or project. Contingency time for construction rework is not normally included in construction schedules. Contingency also excludes *force majeure* (extraordinary events such as major strikes and natural disasters).

Contingency is included to address risks due to items such as:

- Incomplete designs
- Errors & omissions
- Contract (prime and subcontracts) terms and conditions
- Project location and environmental factors
- Availability of skilled labor resources and equipment
- Capabilities and experience of available subcontractors and suppliers
- Construction disturbances (accidents or breakdowns)
- Changes in market conditions
- Regulatory risk
- Land acquisition issues
- Permitting issues
- Technological changes
- Abnormal construction and start-up problems