AACE® International Recommended Practice No. 52R-06

PROSPECTIVE TIME IMPACT ANALYSIS – AS APPLIED IN CONSTRUCTION

TCM Framework: 6.4 – Forensic Performance Assessment

7.2 – Schedule Planning and Development

10.2 – Forecasting

10.3 – Change Management

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Note: As AACE 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) for prospective time impact analysis (TIA) is intended to provide a guideline, not to establish a standard. This recommended practice of AACE International on TIA, as applied in construction industry projects and programs, provides guidelines for the project team to assess and quantify the effects of an unplanned event or events on current project completion. While TIAs are usually performed by a project scheduler and can be applied on a variety of project types, the practice is generally used as part of the total cost management (TCM) change management and forecasting processes.

KEY TERMS

The following terms are used throughout this recommended practice; please refer to the latest revision of RP 10S-90, Cost Engineering Terminology for the current definitions:

- EVENT
- FRAGNET
- UNIMPACTED SCHEDULE
- IMPACTED SCHEDULE
- TARGET ACTIVITY
- DELAY

OVERVIEW

This recommended practice focuses on the basic elements necessary to perform a time impact analysis (TIA) to a construction project CPM schedule. Necessary considerations and optional analysis practices are described. The TIA is a forward-looking, prospective schedule analysis technique that adds a modeled event or events to an unimpacted schedule to determine the potential impact of that event(s) to the longest path and therefore project completion. The prospective TIA procedure is performed while a project is on-going, and thus has a forward-looking or a prospective analysis perspective in near-real time context. Retrospective (forensic) TIA is not typically required during the execution of a project as a prospective TIA is a forecast designed to facilitate a timely contract adjustment prior to the actual work being completely performed. Retrospective TIA analysis is addressed in AACE International Recommended Practice 29R-03, Forensic Schedule Analysis.

This TIA practice concerns itself with time aspects, not cost aspects of projects. The time impact must be quantified prior to determining any potential cost implications. No practical advantage is obtained by including cost factors into a time impact analysis. Linking time and cost into one analysis implies that time impacts are a function of costs, which for the purposes of a prospective TIA is not necessarily true. Separating time analysis from cost analysis makes TIA inherently easier to accomplish and accept contractually, thereby eliminating the cost-driven considerations.
A TIA may also be performed in-house to evaluate the potential or most likely results of alternatives being considered by the contractor in terms of means and methods of completing the project. This is commonly referred to as a *what-if analysis*.

**RECOMMENDED PRACTICE**

Unplanned events on a construction project are inherently unavoidable. If the party responsible for executing the scope of the contract (contractor) has been delayed by the effects of a change in the work or an event that was beyond its ability to reasonably foresee and plan as contracted, then the entity responsible for overseeing performance of the contract (typically, the owner) may be obligated to adjust the contract, depending upon the terms and conditions of contract.

TIA is a simplified analytical procedure oftentimes specified on construction projects to facilitate the award of excusable days to project completion, due to delays caused by events that were not the responsibility of the contractor. The TIA process may also be used by the contractor as an internal method to evaluate alternatives to regain or improve project completion.

Construction law in most localities require the injured party (in this case the contractor) to petition for a contract time extension, if they have been delayed by events not under the control. To this goal, many contracts specify that a TIA be prepared and submitted to objectively substantiate the contractor’s request for a project time extension. Once the duration of time has been agreed upon then the added time-related costs of such a delay can be determined in terms of the contract.

The TIA procedure should be reduced to the most basic level possible and still reflect a reasonable assessment of the result of a delay caused by an event. It is recommended that the time adjustment to the contract be calculated in a timely manner, using an agreed upon method with the results appropriate to the actual delay to a reasonable degree of certainty. In addition to validating the contractor’s entitlement to the issues the contractor claims impacted the project schedule, the owner should approve or reject this TIA based on the validity of the logic, durations, and all other revisions presented in the report. Time impact analysis is not an attempt to simulate past or future reality. It provides a forecast estimate of the impact to the critical path and completion milestones based on the assumptions and plan to execute the changed and, otherwise, impacted work. It is a recognized analytical technique intended to facilitate a reasonable estimation of the time impact to the project caused by a single event or series of events.

The prospective TIA procedure is performed while a project is on-going, and thus has a *forward-looking* or a *prospective analysis* perspective in near-real time context. Retrospective (forensic) TIA is not typically required during the execution of a project as a prospective TIA is a forecast designed to facilitate a timely contract adjustment prior to the actual work being completely performed.

The longer the period between the event and the approval of the TIA, the less useful and valid the prospective TIA becomes. Because *time* is the event being negotiated, the value obtained from a timely resolution of this contractual adjustment is greatly diminished by delay in preparation and/or approval of the TIA. Delay in approval of a TIA may result in a supplemental claim by the contractor of constructive acceleration. Also with the passage of significant time, the owner may feel that delays caused by the contractor have diluted any impacts previously known to have been caused by the owner. At some point, delay in preparation and/or approval of a TIA so diminishes the value of the analysis that a more thorough retrospective, forensic analysis becomes more appropriate as any impact will have been absorbed and subject to actual data, not estimated.

The TIA is typically associated with the modeling of the effects of a single change or event, however if several events occur within the same update period, their total effect could be modeled in the same analysis. This would be important if there are multiple delay causes that are assigned to different parties and it is necessary to identify...