DELAY AND DELAY ANALYSIS: ISN'T IT SIMPLE ?

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Abstract

The intended purpose of schedule delay analysis is to determine what happened, what was the impact on the schedule, and what was the cause ? At the outset delay analysis should determine what events occurred and when. From this preliminary review , delay analysis should then determine with some specificity, what was the outcome in terms of the schedule? That is, was the project delayed and, if so, by how much? Finally, delay analysis should be used to determine who was responsible (the proximate cause) for the events which resulted in the project delay. From this analysis, legal and contractual conclusions can be reached as to what type(s) of delay occurred and what, if any, damages are owed as a result. Simple? No! Why not? Because there is no industry-wide agreement on what a delay analysis consists of nor on which schedule delay analysis technique should be employed. Does it matter? After all, scheduling is "quasi-scientific" and "objective" (i.e., fact driven). All analytical techniques should render the same result, shouldn't they? This presentation discusses the status of a Recommended Practice that AACEI has had underdevelopment for nearly two years now – the Recommended Practice on Forensic Schedule Analysis. This Recommended Practice defines, describes and explains the various forensic schedule analysis techniques currently employed in the construction industry. The Recommended Practice neither excludes nor endorses any of the methods discussed. Rather, it classifies and discusses the known methods, offers caveats on the use of each method and discusses best current practices and implementation of each technique. This paper summarizes portions of the Recommended Practice and provides a status update on the document.

INTRODUCTION [1]

At AACEI's 2002 Annual Meeting the Claims and Dispute Resolution (CDR) Committee initiated a debate over methods and practices of calculating lost labor productivity in construction claim situations. What the Committee rapidly determined was that (a) there are many ways to perform such a calculation; (b) various methods are often driven by the size of the dispute, the quality and quantity of project data available to work with, the analyst's budget and the amount of time available to perform such a task; and, (c) there is no industry wide agreement on how to perform such an analysis. The Committee concluded that an acceptable set of standard practices should be promulgated to provide a roadmap for those involved in preparing such studies and calculations. The CDR Committee formed a task force who undertook preparation of a Recommended Practice on the subject. Following AACEI's standard procedure concerning issuance of Recommended Practice's the task force prepared a draft document which was reviewed first by the CDR Committee as a whole and then peer reviewed by a larger group of AACEI members and other practitioners in North America and Europe. Finally, the

[1] Major portions of this paper have been extracted from the AACEI CDR Committee Internal Discussion Draft RP/FSA Project Report, Kenji Hoshino, Project Manager, December 2005, AACEI, Morgantown, WV. This paper should be considered the author's interpretation of the most recent internal discussion draft. The public comment draft of the Recommended Practice – Forensic Schedule Analysis will be available by June 2006. Those interested in contributing to this project prior to it reaching the public comment draft stage should contact the project via its administrative contact, mdennis@pcfconsultants.com .

Recommended Practice was reviewed by AACEI's Technical Board. The result of this effort was the adoption and publication of AACEI's Recommended Practice No. 25R-03, Estimating Lost Labor Productivity in Construction Claims[2] in the spring of 2004 some 21 months after the effort was started.

The CDR Committee at AACEI's 2004 Annual Meeting initiated a second debate, this time concerning the issue of schedule delay analysis – often referred to by North American[3] practitioners as forensic scheduling analysis. Again, the Committee rapidly determined that in North America there is no agreement over the names and identities of analytical methods nor standards of practice concerning means and methods for forensic scheduling. There are numerous ways to perform such schedule delay analysis. Each methodology has strong points and weak points. While Courts in North America tend to prefer critical path method (CPM) analysis when dealing with issues of delay, they have not mandated, nor have they banned, specific practices. The Committee concluded, as they had when dealing with methods of calculating labor productivity, that forensic scheduling methods are often a function of the complexity of the dispute; the amount in controversy; the amount of scheduling related data available to work with; and, the budget and time to perform such analysis. Following on this debate, at AACEI's 2004 Annual Meeting, the CDR Committee formed another task force to begin the process of drafting a Recommended Practice on Forensic Scheduling Analysis referred to hereinafter as the RP/FSA.

The intent of AACEI's RP/FSA is to provide a unifying, standard technical reference for the forensic application of schedule delay analysis. "Forensic" is defined as "belonging to, used in, or suitable to courts of judicature or to public discussion and debate".[4] Thus, forensic schedule analysis is that form of schedule delay analysis intended for use in delay claim situations in negotiation, mediation, arbitration or litigation. As a result, the RP/FSA is focuses primarily on the Critical Path Method (CPM) of scheduling. As defined in the RP/FSA, forensic scheduling is the study and investigation of events on a project using CPM or other recognized schedule calculation methods, for potential use in a legal proceeding. Forensic schedule analysis is the study of how actual events on a project interacted in the context of a complex scheduling model for the purpose of understanding the significance of those events on the following activities within the scheduling model.

The objective of the RP/FSA is to set forth standard terminology and clear definitions; to define and establish minimum procedural protocols for the various accepted techniques of forensic scheduling. Implementation of this RP/FSA should result in reduced disagreement amongst practitioners over technical implementation of accepted techniques and allow professionals and their clients to concentrate on resolving disputes.

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[2] AACE International Recommended Practice No. 25R-03, Estimating Lost Labor Productivity in Construction Claims. AACE International, Morgantown, West Virginia, U.S.A., 2004.
[3] In the context of this paper the term "North American" refers to Canadian and U.S. practices, legal precedents, etc.
[4] Webster's New Collegiate Dictionary, G. & C. Merriam Company, Springfield, MA, 1979.

PURPOSE OF FORENSIC SCHEDULING

The basic purpose and traditional uses of forensic scheduling typically include the following.

- **Identify and Quantify Compensable Delay**

Forensic scheduling analysis is generally used, initially, by a claimant [5] is seeking to prove entitlement to a time extension and time related damages such as extended field and home office overheads, equipment rental, cost escalation, etc .

- **Identify and Quantify Excusable Delay**

Forensic scheduling analysis is also employed to justify entitlement to a time extension in order to avoid late completion damages under the contract. When the contract involves an early completion bonus, forensic scheduling may also be employed to show entitlement the bonus.

- **Identify and Quantify Owner's Compensable Delay**

Owners may employ forensic scheduling to determine whether late completion damages are recoverable in accordance with the contract documents. In other instances, owners may utilize forensic scheduling to defend against claims of owner -caused or compensable delay from contractors.

- **Apportionment of Delay**

Forensic schedule analysis may also play a role in analyzing a delay period or periods and assigning responsibility among the various parties to the contract. This is commonly used when seeking to determine whether delay is concurrent (that is inextricably intertwined) or can be broken down and apportioned to various parties.

- **Identify and Quantify Schedule Variance**

Forensic scheduling is used to determine the differences between planned and as-built schedules or the differences between specific schedule updates. Frequently, this is also the starting point of a defensive forensic schedule analysis.

- **Identify and Quantify Schedule Acceleration**

Forensic scheduling is also used to demonstrate that the schedule was actually shortened by actions of one or both parties and by how much.

[5] The "claimant" is the party making or presenting the claim.

- **Identify and Quantify Schedule Disruption**

Finally, forensic schedule analysis may be employed by a claimant seeking to prove changes to the schedule which resulted in impacts rather than delay. Disruption may include schedule compression, movement of activities from good to bad weather periods, stacking or crowding of trades, out of sequence work, concurrent operations, etc.

BASIC PREMISES AND ASSUMPTIONS

The basic premises underlying the RP/FSA are the following.

- Forensic scheduling is a technical field related to but distinct from project planning and scheduling. It is not simply a subset of traditional scheduling.

- Uniform practices intended to assure correct technical implementation of forensic scheduling can and should be established, independent of legal standards and theories governing claims related to scheduling, delay and disruption.

- Standard practices and protocols that may be sufficient for the purpose of project planning, scheduling and controls may not necessarily be adequate for forensic schedule analysis.

- It is acknowledged that all methodologies are subject manipulation as they all involve judgments made by the analyst either in preparation or examination of a forensic schedule.

- The RP/FSA should be used by practitioners to help establish consistency of practice in the spirit of intellectual honesty.

SCOPE AND FOCUS

The scope and focus of the RP/FSA is set forth below.

- The RP/FSA focuses on the technical aspects of forensic schedule analysis methods and the practices that should be employed.

- While the RP/FSA focuses on technical aspects of forensic scheduling, relevant North American legal principles will be discussed to the extent that they affect the choice of techniques and their relative advantages and disadvantages.

- The RP/FSA defines, describes and explains to use of various forensic schedule analysis methods currently employed by professional practitioners.

- It is not the intent of the RP/FSA to exclude or endorse any particular method. However, the RP/FSA does set forth caveats for use of each type and includes a discussion of the best current practices and implementation of each method.

- The RP/FSA focuses primarily on the use of forensic scheduling techniques for factual analysis as opposed to the assignment of delay responsibility. This focus does not, however, preclude the practitioner from performing such delay analysis based on their own assumptions regarding liability.

- The RP/FSA is not intended to be an exhaustive treatment of schedule analysis techniques. Users of the RP/FSA are assumed to have competent working knowledge of the basic components of project planning and scheduling. While the RP /FSA explains how schedules generated by the planning and scheduling process become the source data for forensic schedule analysis, it is not intended to be a manual for basic scheduling.

- The RP/FSA is not intended to override contract provisions regarding schedule analysis methods or other mutual agreement of the parties regarding the same.

- The RP/FSA is not intended to contradict other similar standards or practices. To the extent that it may be interpreted in this manner, effort needs to be made to reconcile various practices.

- The current version of the RP/FSA deals only with CPM based schedule delay analysis methods. Future versions will be required to deal with delay analysis using such methods as line of balance scheduling, linear scheduling, etc.

- The taxonomic terms used in the RP/FSA are correlated to regionally diverse common names allowing for freedom of use with respect to regional terms.

TAXONOMY

At the outset, the CDR Committee spent considerable time establishing the taxonomy for forensic scheduling. This is a hierarchical classification of known methods of CPM-based schedule impact analysis techniques. The taxonomy is intended to classify techniques used to analyze how delays and disruption affect CPM networks as opposed to the tools used to analyze parts of a network. Classification is an important part of this RP/FSA as it documents the logic of forensic scheduling and establishes a rational basis for recommended practices. For example, techniques such as the Window Analysis or the Collapsed As-Built Analysis are classified in this taxonomy. Procedures such as fragnet modeling, bar charting or linear graphing are considered presentation tools, not systems. As tools, they are not classified under this taxonomy.

- **Level 1: Timing**

The first hierarchical level of the taxonomy is Timing, which consists of two branches – Prospective and Retrospective. What is classified in Level 1 is the actual point in time in which the delay analysis is performed.

- **Prospective Timing:** These methods employ a schedule delay analysis performed in real time (at or near the time the event occurs or is forecast), prior to the delay arising from the event or where the analysis takes place contemporaneously with the delay event itself.

Prospective schedule delay analysis consists of an estimate of delay and delay impact as the reality of the delay is still in the future. This type of schedule analysis typically occurs while the project is still underway and is most often performed by schedulers actively involved in the project.[6] The Time Impact Analysis methodology is an example.

- **Retrospective Timing**: These methodologies are used when the schedule delay analysis is performed after the delay event has arisen and the impacts are known. The timing may be soon after the event but prior to the completion of the project or after the completion of the entire project. In either case, the delay event and its duration are known and what is being modeled is the impact of the event on the remainder of the schedule. It should be noted that forward-looking analysis (referred to as "additive modeling" in the RP/FSA) performed after project completion is still considered retrospective in terms of timing. It is considered in this manner because regardless of the technique being applied, the analyst has the benefit of full knowledge of the event.[7] A Collapsed As-Built forensic schedule analysis is an example.

This is one of the most significant factors in the choice of methods. Many contract documents specify a prospective timing method of delay analysis in order to try to resolve delay issues as they arise. But, at the end of the project, even when using an additive modeling technique, the schedule analyst knows what actually occurred on the project and may need to use as-built information as the basis of the analysis. Further, while prospective analysis is typically performed by individuals actively involved in the project, retrospective analysis is most often performed by specialized forensic analysts who had no involvement in the project.

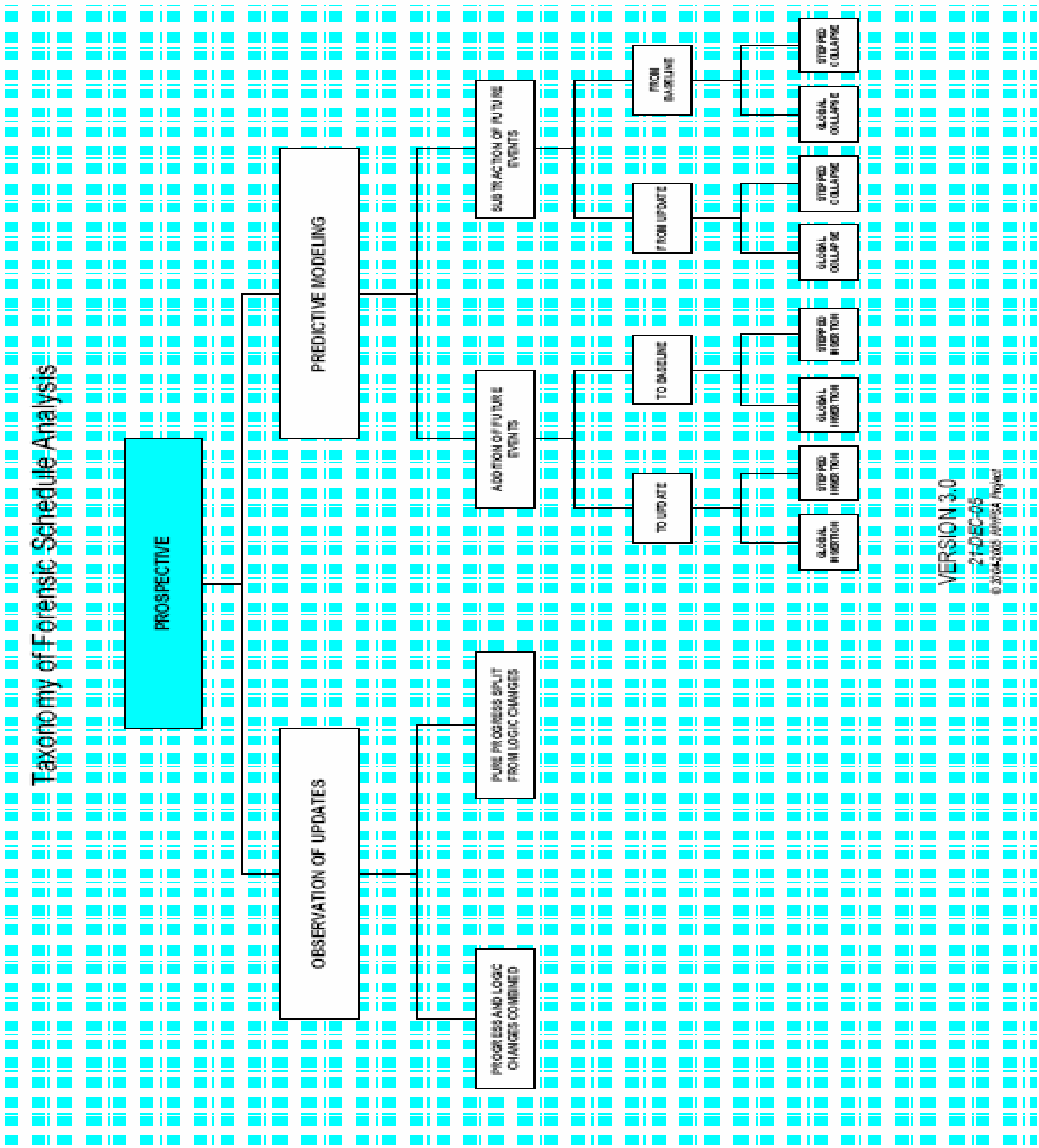
- **Level 2: Basic Methods**

The second level of the hierarchy is the Basic Method which consists of two methods – Observational and Modeled. The distinction between the two methods is whether the analyst's expertise is utilized for the purpose of interpretation and evaluation of existing scheduling data or for constructing models or simulations and then interpreting and evaluating the results.

- **Observational Method:** These methodologies require the analyst to examine a schedule or compare one to another, without making any changes, to perform an analysis. Contemporaneous Period Analysis and As-Built vs. As-Planned forensic scheduling are examples of the observational method.

- **Modeled Method:** These techniques require the analyst to insert or extract activities representing delays to a CPM network and compare the calculated results before and after schedule modeling to determine delays and impacts. Collapsed As-Built, Time Impact Analysis and Impacted As-Planned forensic scheduling are examples of this method.

[6] See following graphic showing the Taxonomy of Prospective Forensic Schedule Analysis.
[7] See following graphic showing the Taxonomy of Retrospective Forensic Schedule Analysis.


Taxonomy of Forensic Schedule Analysis
PROSPECTIVE
PREDICTIVE MODELING
OBSERVATION OF UPDATES
SUBTRACTION OF FUTURE EVENTS
ADDITION OF FUTURE EVENTS
PURE PROGRESS SPLIT FROM LOGIC CHANGES
PROGRESS AND LOGIC CHANGES COMBINED
FROM BASELINE
FROM UPDATE
TO BASELINE
TO UPDATE
STEPPED COLLAPSE
GLOBAL COLLAPSE
STEPPED COLLAPSE
GLOBAL COLLAPSE
STEPPED INSERTION
GLOBAL INSERTION
STEPPED INSERTION
GLOBAL INSERTION
VERSION 3.0
21-DEC-05
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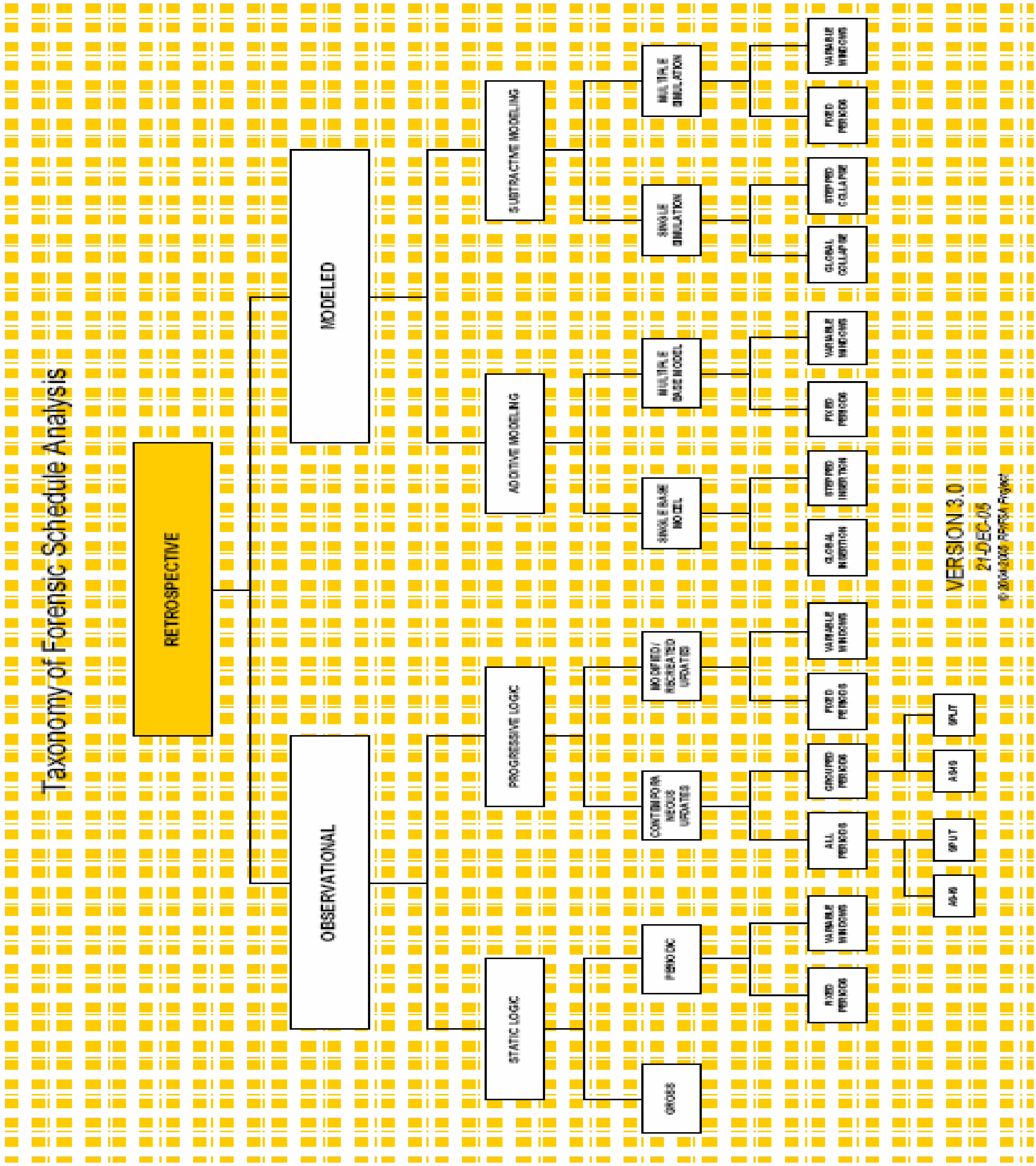
Taxonomy of Forensic Schedule Analysis
RETROSPECTIVE
OBSERVATIONAL
MODELED
STATIC LOGIC
PROGRESSIVE LOGIC
ADDITIVE MODELING
SUBTRACTIVE MODELING
VERSION 3.0
21-DEC-05

➢ Level 3: Specific Methods

At this level are the Specific Methods. The branching at Level 3 is dependent upon whether the technique falls under the Observational or Modeled Method. Under the Observational Method there is a further breakdown based on whether the forensic evaluation considers just the planned schedule logic or revised schedule logic developed during the course of the project (sometime referred to as dynamic or progressive logic.

- **Static Logic Observation:** These methods compare one set of network logic to another set of the same schedule. The comparison may be with the as -built logic or with a statused logic of a later schedule. "Static" refers to the fact that the observation consists of comparing the later or as-built logic with only one set of as-planned logic. The As-Planned vs. As-Built forensic schedule analysis is an example.

- **Dynamic Logic Observation:** By contrast, these methods involve the use of schedule updates whose logic varies both from the as-planned logic as well as from other updates. This method specifically allows changes in logic implemented during the project. The Contemporaneous Period Analysis is an example of this method.

Under the Modeled Method there is a further logical breakdown between those techniques that add delays to a schedule versus those that subtract delays.

- **Subtractive Modeling:** These techniques requires the analyst to compare one schedule with another that the analyst has calculated by subtracting certain events , activities or durations from a schedule to model a situation. The Collapsed As-Built technique is an example of Subtractive Modeling.

- **Additive Modeling:** Another set of techniques compare one schedule with another created by the analyst by adding certain events, activities or durations to a schedule to model a scenario. The Impacted As-Planned, some forms of the Windows Analysis, the Time Impact Analysis (TIA) or Time Impact Evaluation (TIE) techniques are examples of Additive Modeling. [8]

➢ Level 4: Basic Implementation

This level differentiates the implementation of the various methods outlined above. The Static Method can be implemented in a Gross or a Periodic Mode. The Progressive Logic Method can be implemented as Contemporaneous: As-Is, Contemporaneous: Split, Modified or Recreated Modes. And the Additive or Subtractive Modeling Methods can be implemented as a Single Base/Simulation or a Multi Base/Simulation.

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[8] Caution must be employed with utilizing the terms Time Impact Analysis (TIA) and Time Impact Evaluation (TIE) as these terms are frequently used in North American contract documents to refer to other basic and specific methods as well. This RP attempts to treat these terms very specifically but the loose writing of many scheduling specifications have almost made these generic terms.

- **Gross or Periodic Modes:** There are two implementation modes under the Static Logic variation of the Observational Method. Gross implementation considers the entire project as one single analysis period without any segmentation. Periodic implementation breaks the project duration into two or more periods for specific analysis focusing on each period.

- **Contemporaneous/As-Is or Contemporaneous/Split:** This implementation occurs under the Progressive Logic variation of the Observational Method. Both methodologies utilize schedules updated prepared contemporaneously on the project. As-Is implementation evaluates the differences between successive updates as a whole while Split implementation bifurcates each update into progress and logic change components. The intended purpose of this bifurcation is to isolate schedule slippage or recovery due to actual progress from that brought about by changes in sequence, logic or duration.

- **Modified or Recreated:** This logical pairing, occurring under the Progressive Logic variation of the Observational Method, also involves the observation of schedule updates. This implementation involves extensive modification of contemporaneous updates or recreation of entire updates where contemporaneous updates do not exist.

- **Single Base/Simulation or Multi Base/Simulation:** This implementation occurs under the Modeled Method. The distinction is whether the Additive or Subtractive Modeling is performed on a single CPM network or on several CPM networks. For example, a modeled analysis that adds delays to a single baseline CPM is a Single Base/Simulation of the Additive Method whereas one that subtracts delays from multiple as-built simulations is a Multi Base/Simulation implementation of the Subtractive Method. The Impacted As-Planned technique is an example of the Single Base/Simulation Additive Model. The Collapsed As-Built technique is an example of a Single Base/Simulation Subtractive Method while certain types of Window Analysis are examples of Multi/Base Simulation.

- **Level 5: Specific Implementation**

  - **Fixed Periods vs. Variable Windows/Grouped Periods:** In the Fixed Period implementation the periods for analysis are fixed in date and duration by the data dates used for the contemporaneous schedule updates. These are typically regular periods, such as the schedule's monthly updates. Each period is analyzed in this methodology on a stand alone basis. The act of grouping the segments for summarization after each segment is analyzed is called Blocking. The Variable Window/Grouped Period technique establishes analytical periods other than Fixed Periods. For example, a Variable Window analysis may use the completion dates of various project phases as the analytical period. Either technique may be employed when performing the Window Analysis method.

  - **Global (Insertion or Extraction) vs. Stepped (Insertion or Extraction):** This implementation pair occurs under the Single Base/Simulation basic implementation under either the Additive or Subtractive Model methods. Under Global implementation delays are inserted or collapsed all at once, while under the Stepped implementation delays are inserted or extracted sequentially (either individually or grouped). While there are other variations in the sequence of stepping insertions or subtractions, the typical insertion technique is from the beginning of the project towards the end whereas stepped collapse typically starts at the end of the project and progresses toward the start.

NOMENCLATURE

The various methods and implementation variations identified in the RP/FSA are known by various names. Current usage of these names is loose and undisciplined even amongst practicing forensic scheduling professionals which frequently leads to misunderstanding and needless arguments. While the RP/FSA certainly cannot enforce a more disciplined use of common names, it is hoped that by establishing a clear correlation between each taxonomic classification and a common name, usage will become more specific and better understood over time. The following Nomenclature Correspondence Table shows the commonly associated names for each taxonomic classification which has been agreed upon to date.[9]

SOURCE VALIDATION PROTOCOLS

While forensic schedulers have to rely upon contemporaneous project documentation, they would be less than objective analysts if they made no effort to corroborate the documentation they are relying upon. Accordingly, the RP/FSA sets forth a series of recommended protocols designed to assist the analyst in validating the source data upon which they rely.

➢ Baseline Schedule: Selection, Validation and Rectification

This portion of the RP/FSA sets forth some validation protocols which ought to be applied to the baseline schedule to determine whether the baseline schedule is a reliable document from which to start a forensic analysis. Note that validation for forensic purposes is fundamentally different from validation for the purposes of project controls. What may be adequate for project controls may not be adequate for forensic scheduling, and vice versa. Thus, the initial focus in the RP/FSA is in assuring the functional utility of the baseline data as opposed to assuring the reasonableness of the information that is represented by the data. The recommended minimum validation checks an analysis ought to make are the following.

- Full scope of work – Represented in the schedule.
- Data date – Set at Notice to Proceed (NTP) or earlier with no actual progress on any event.
- Continuous critical path – Using the longest path criteria, see that there is at least one continuous critical path from NTP to the last activity.
- Activities – Have at least one predecessor and one successor activity – Except for the start and finish milestones.
- Controlling constraints – Should be replaced with logic or activities.
- Each change made to the baseline for purposes of rectification must be carefully documented and the basis for the change explained.

[9] See the graphic on the following page, Nomenclature Correspondence Table.

1.4 Nomenclature Correspondence Table

Taxonomy	1	RETROSPECTIVE														
	2	OBSERVATIONAL							MODELED							
	3	Static Logic			Progressive Logic				Additive				Subtractive			
	4	Gross	Periodic		Contemporaneous Updates (As-Is or Split)		Modified / Reconstructed Updates		Single Base		Multi Base		Single Simulation		Multi Simulation	
	5		Fixed Periods	Variable Windows	All Periods	Grouped Periods	Fixed Periods	Variable Windows	Global Insertion	Stepped Insertion	Fixed Periods	Variable Windows	Global Collapse	Stepped Collapse	Fixed Periods	Variable Windows
Commonly Associated Names		As-Planned vs As-Built	Window Analysis		Contemporaneous Period Analysis, Time Impact Analysis	Contemporaneous Period Analysis, Time Impact Analysis, Window Analysis	Contemporaneous Period Analysis, Time Impact Analysis	Window Analysis, Time Impact Analysis	Impacted As-Planned	Time Impact Analysis, Impacted As-Planned	Time Impact Analysis	Window Analysis, Impacted As-Planned	Collapsed As-Built	Time Impact Analysis, Collapsed As-Built	Time Impact Analysis	Window Analysis, Collapsed As-Built

Taxonomy	1	PROSPECTIVE														
	2	OBSERVATIONAL							MODELED							
	3				Progressive Logic				Additive				Subtractive			
	4				Contemporaneous Update (As-Is or Split)				Single Base				Single Base			
	5								Global	Stepped			Global	Stepped		
Commonly Associated Names					Contemporaneous Period Analysis, Time Impact Analysis, Window Analysis				Impacted As-Planned. Time Impact Analysis				But For, Time Impact Analysis			

- Non-standard toggle and option settings – The basis for the settings must be documented.
- Milestone dates that violate the contract terms – The basis must be documented .
- Other aspects of schedule which violate contract terms – Must be documented.

Recommended enhanced protocols applicable to Baseline Validation include the following.

- Finish/Start (FS) logic with lag values greater than one week – Should be replaced with an activity.
- Start/Start (SS) logic with lag values greater than 50% of the duration of the predecessor – Should be replaced with an activity.
- Finish/finish (FF) logic with lag values larger than 50% of the duration of the successor – Should be replaced with an activity.
- FS logic with negative values larger than one week – Should be replaced with another type of logic with a zero or positive lag that does not violate the protocols above.
- SS or FF logic with any negative value – Should be replaced with another type of logic that does not contravene the protocols above.
- Non-controlling constraints – The basis of the constraint date must be documented.
- Level of detail – Such that no one activity carries more than 0.5% of the contract value.

➢ As-Built Schedule: Sourcing, Organization and Validation

This section of the RP/FSA discusses issues associated with the use of the as-built schedule as the basis of the forensic schedule analysis. The recommended minimum protocols follow.

- As-built data – Tabulate and document all sources for data and evaluate each for reliability.
- If the primary source of as-built dates is a schedule update – Perform a check of the dates using other source documentation, if possible.
- Random check of as-built activity dates – Randomly check at least 2% - 5% of the as-built dates against other sources of data. Determine whether a more thorough check is needed and, if so, perform it.
- Dates of significant activities – Accurate within 1 working day and dates of other activities accurate within 5 working days.
- If a baseline schedule exists – Create a fully progressed baseline schedule.

Some general comments and caveats applicable to validation of as-built schedules include the following.

- Level of detail – Although typically dependent upon the nature of the claim and specific issues, the recommended level of detail is the same as the accepted baseline schedule.
- Schedule delay scenarios – Delays often involve external factors not included in the baseline schedule (such as changes, differing site conditions, force majeure events, etc.) the analyst may be required to add activities and expand the level of detail beyond that of the baseline schedule to property account for these external activities.

➢ Schedule Updates: Validation and Reconstruction

This section discusses the protocols which are recommended for validation of the various schedule updates which the analyst intends to use are part of the forensic schedule analysis. The minimum recommended protocols are the following.

- Start point – Starts with a recognized baseline schedule.
- Entire project – Analyzes the entire project from start to finish or to current date if forensic scheduling is to be performed during the life of the project.
- Actual start and finish dates – Once progressed, the actual dates remain the same at all times.
- Calculation mode – The calculation mode of each schedule update is consistent with all other updates.
- Changes to updates – Each change made to any update for rectification must be fully documented and explained.
- Remaining durations and percentages complete – Spot checked for accuracy.

Recommended enhanced protocols applicable to schedule updates include the following.

- Submitted updates – Use officially submitted updates.
- Each updates – Should be validated and rectified in accordance with the protocols listed for baseline schedules.
- As-built data – Should be validated and rectified as per the protocols for as-built schedules.
- Bifurcation of updates – Schedule update data should be bifurcated from logic revisions for each update and examined separately.

➢ As-Built Critical Path Identification

This section discusses considerations relevant to a systematic identification of the as-built controlling or critical path. The general protocol impacts all specific protocols that use the as-built schedule or schedule updates. The proper implementation of this protocol depends upon sound data captured during the life of the project. The recommended minimum protocol includes the following.

- Sources of data – Tabulate all sources of data used to identify the as-built critical path and evaluate each for reliability.
- Schedule updates – If any are available consider the critical and near critical path activities starting at each data date.
- Chain of controlling predecessor activities – Review carefully and validate the chain of activities immediately prior to the data date for each update.
- Calculation mode – A consistent calculation mode should be employed for each update.
- Longest path criteria – Should be used in calculating the critical path for each update.
- Subcritical activities – Carefully review and validate those activities with the near lowest float and on the near longest path.

Some general comments, caveats and exceptions pertaining to this general protocol follow.

- As-built critical path – The analyst must recognize that the as-built critical path cannot be determined solely by float calculations. It must be ascertained from multiple sources of project data.
- Perception of criticality – The perception of criticality is as important as the fact of criticality as real time project decisions are made on perceptions current at that point.
- Objective identification – Objective identification is difficult without the benefit of a baseline schedule and at least some schedule updates.
- No updates – In the absence of schedule updates a highly detailed as-built schedule is critical to any forensic schedule analysis.

Identification and Quantification of Discrete Impact Events and Issues

This section of the RP/FSA discusses the compilation of information regarding delay events, discrete impact events and the activities that are inserted, extracted or considered in the various specific protocols. The recommended minimum protocol includes the following.

- Sources of data – Tabulate all sources of data used to identify the as-built critical path and evaluate each for reliability.
- Actual dates – Identify the actual start and finish dates for each delay along with the events which occurred on those dates and their relevance to the delay.
- Not a complete stoppage – If the delay is not a complete stoppage or is not continuous throughout the delay period, quantify the net duration of the delay during the overall period.
- Each delay issue – For each issue, distinguish the informational delay portion from the actual performance of the disrupted, changed or extra work.
- Each delay issue – For each issue, document and reconcile the claimed delay duration against any time extension received.
- Each discrete delay activity – Identify the activity number of each schedule activity impacted by the delay.
- For each association of delay activity to impacted schedule activity – Identify whether the resulting impact was a delayed start or extended duration of the impacted activity.

Some general comments and caveats applicable to this general protocol follow.

- Distinguish cause from effect – Be aware of successive linkage of cause and effect relationships in documenting and establishing the logic for delay activities.
- Do not prejudge criticality – Criticality must be calculated and not prejudged by the analyst. The quantification of each delay can ultimately be segregated into local, fragnet and total project impacts.

METHOD IMPLEMENTATION PROTOCOLS

This section of the RP/FSA, perhaps the longest, and certainly the most complex, discusses the implementation of each of the methodologies mentioned earlier. Each forensic schedule analysis technique is identified and guidance on how to implement each is offered. It is noted that the use of the Source Validation Protocols is a condition precedent to each of the specific method implementation protocols. The specific methodologies included in the RP/FSA are listed herein below along with the appropriate recommendations concerning implementation and usage.

- **Observational – Static – Gross**

  - **Description of Methodology** – This is a method where the planned schedule is compared either to an as-built schedule or to some schedule update. On the surface the method does not require the use of CPM scheduling techniques but observes the differences between the schedules compared and then attempts to identify what caused the differences. It is classified as a static method because it relies on logic underlying the baseline schedule. It is characterized as gross because the analysis is performed on the total continuum between the schedules compared on not on periodic updates.

  - **Common Names** – The most common names given to this approach are the **As-Planned vs. As-Built**, **AP v AB**, **Planned vs Actual** or **As-Planned vs Update** method.

  - **Minimum Source Validation Protocols** – The analyst needs to validate the baseline, validate the as-built or the schedule update and implement the delay identification and quantification protocol.

  - **Minimum Implementation Protocols** – As the baseline schedule is a CPM model, CPM principles should be applied to the analysis of the as-planned schedule. The comparison shown should use a properly time scaled diagram. The duration of corresponding activities on each schedule should be based on the same calendar. All claimed delay events and time extensions should be depicted properly and labeled.

  - **Enhanced Implementation Protocols** – Assuming the as-built schedule is a fully progressed baseline schedule an activity to activity comparison should be performed, where possible. A table should be prepared comparing the planned and actual durations for activities impacted, along with specific causation. Finally, a table should be prepared comparing the planned controlling predecessor logic of each delay activity to the actual controlling predecessor logic and listing the cause of each variance.

  - **Caveats and Limitations** – The minimum implementation protocol of this method ought to be supplemented by another analytical method. This method should not be used by itself except in the simplest cases – such as a schedule where there is only one single clearly defined chain of activities on the longest path which stayed as the longest path throughout the entire project.

- **Observational – Static/Periodic**

  - **Description of Methodology** – Also observational, this technique compares the planned to the as-built schedule or a schedule update. However, this method does so in multiple segments rather than a single comparison. It is classified as a static method because it relies on logic underlying the baseline schedule. It is characterized as periodic because the analysis is performed on multiple segments of time throughout the life of the project.

- **Common Names** – Some of the more common names applied to this methodology include **As-Planned vs As-Built**, **AP v AB**, **Planned vs Actual**, **As-Planned vs Update**, **Window Analysis** and **Schedule Windows Analysis**.

- **Minimum Source Validation Protocols** – As with the previous method, the analyst must perform the following minimum source validations – Baseline, As-Built, Update and Delay Identification and Quantification.

- **Minimum Implementation Protocols** – As the baseline schedule is a CPM model, CPM principles should be applied to the analysis of the as-planned schedule. The comparison shown should use a properly time scaled diagram. The duration of activities on each schedule should be based on the same calendar. All claimed delay events and time extensions should be depicted properly and labeled. A tabulation summarizing the variances quantified for each period should be prepared and the total of the variances reconciled.

- **Enhanced Implementation Protocols** – If the as-built schedule is a fully progressed baseline schedule a one to one comparison of each activity should be prepared. Additionally, a duration and lag variance analysis can also be prepared.

- **Specific Implementation Protocols**

  <u>Fixed Periods</u> – The analytical periods are identical in duration and may coincide with regular schedule updates

  <u>Variable Periods</u> – The analysis periods vary in duration (such as when the periods are tied to completion of project milestones) and are characterized by different types of work being performed, delaying influences and their impact on the schedule may change period to period.

- **Caveats and Limitations** – Tabulation of the variances by period and reconciliation of all delays must be performed to eliminate the possibility of skewing the results of the analysis. As with the previous method, this method should be supplemented by another analytical method unless the "simple case" scenario described earlier exists.

➢ **Observational – Dynamic/Contemporaneous – As-Is**

- **Description of Methodology** – This is a retrospective method which uses schedule updates to quantify delays and identify causation. It relies upon forward looking calculations imposed at the time the updates were prepared. It is an observational technique in that it does not involve modeling of delays. Rather, the analyst observes changes from update to update, measures the schedule variances and seeks documentation of causation for such variances. It is a dynamic logic technique because the method relies upon schedule updates whose logic may have changed over time. It is referred to as contemporaneous because the updates were prepared during the life of the project, not after project completion. And, it is labeled "as-is" because the updates are evaluated in their as-is condition are not revised during the analysis.

- **Common Names** – This method is sometimes referred to as **Contemporaneous Period Analysis**, **Contemporaneous Project Analysis**, **Observational CPA**, **Update Analysis**, **Month-to-Month Analysis**, **Window Analysis** or **Schedule Windows Analysis**.

- **Minimum Source Validation Protocols** – The analyst must implement the schedule update validation protocol for each schedule update relied upon.

- **Enhanced Source Validation Protocols** – The analyst may also need to implement both the baseline and the as-built validation protocols mentioned earlier.

- **Minimum Implementation Protocols** – In performing this type of analysis, all contract time extensions granted during the project must be recognized and accounted for. Activities used to track time losses and gains must be identified in the network. Separately, activities used to track other schedule network time losses or gains must also be identified. Finally, the analyst must use both the longest path and the least float criteria to identify the controlling chain of activities.

- **Specific Implementation Protocols**

  All Periods – Analysis of each and every period update must be performed. Whether the update periods are fixed or variable is irrelevant as the analyst must rely upon the contemporaneous updates and cannot change them.

  Grouped Periods – The schedule updates may be grouped for a single observational analysis in order to calculate schedule variances. For example, the analyst may use all updates between January and May in a single grouping to make such observations and calculations.

  Blocked Periods – After individual periods are analyzed, they may be blocked solely for the purposes of summarization. This practice is distinguished from grouping as blocking is a summarization of an analysis that has already undergone an All-Periods implementation.

- **Caveats and Limitations** – Except for very simple networks this technique is generally incapable of distinguishing between delays caused by logic changes as opposed to those brought about by delays and impacts to schedules. The all periods implementation is generally more precise than grouped periods. The grouped periods methodology may mask unfavorable events for the party performing such an analysis. In the rare occurrence that the logic of the network never changed during the performance of the work, this method cannot be classified as dynamic but, by default, becomes a static logic method which relies wholly on the logic of the baseline schedule.

- **Observational – Dynamic/Contemporaneous – Split**

  - **Description of Methodology** – This methodology is virtually identical in all respects to the previously discussed method except that between each update the analyst creates a file consisting solely of progress update information, absent all logic changes. This allows the analyst to look at each update in a two step process – first, progress only and second, logic changes between updates. This bifurcation of the updates makes the analysis of delay (and its causation) more precise. As with the above method, it is a retrospective analysis using forward looking calculations. It is both an observational technique, a dynamic method, and contemporaneous for the same reasons discussed in the previous methodology.

  - **Common Names** – Names variously associated with this methodology include **Contemporaneous Period Analysis**, **Contemporaneous Project Analysis**, **Bifurcated CPA**, **Half Stepped Update Analysis**, **Two Stepped Update Analysis**, **Month-to-Month Analysis**, **Window Analysis** or **Schedule Windows Analysis**.

  - **Minimum Source Validation Protocols** – The analysis should perform the Update Validation Protocol.

  - **Enhanced Source Validation Protocols** – The analyst may also need to perform the Baseline Validation Protocol and the As-Built validation Protocol.

  - **Minimum Implementation Protocols** – At a minimum, this method must recognize all time extensions granted on the project. Activity(ies) used to track time losses and gains must be identified in the network. Separately, activities used to track other schedule network time losses or gains must also be identified. Finally, the analyst must use both the longest path and the least float criteria to identify the controlling chain of activities.

  - **Specific Implementation Protocols**

    <u>All Periods</u> – Analysis of each and every period update must be performed. Whether the update periods are fixed or variable is irrelevant as the analyst must rely upon the contemporaneous updates and cannot change them.

    <u>Grouped Periods</u> – The schedule updates may be grouped for a single observational analysis in order to calculate schedule variances. For example, the analyst may use all updates between January and May in a single grouping to make such observations and calculations.

    <u>Blocked Periods</u> – After individual periods are analyzed, they may be blocked solely for the purposes of summarization. This practice is distinguished from grouping as blocking is a summarization of an analysis that has already undergone an All-Periods implementation.

- **Caveats and Limitations** – The all periods implementation is generally more precise than grouped periods. The grouped periods methodology may mask unfavorable events for the party performing such an analysis. In the rare occurrence that the logic of the network never changed during the performance of the work, this method cannot be classified as dynamic but, by default, becomes a static logic method which relies wholly on the logic of the baseline schedule.

➢ **Observational – Dynamic/Modified or Recreated**

- **Description of Methodology** – This method is also observational. This methodology, however, rests upon modified schedule updates or completely recreated updates. Thus, this methodology is fundamentally different than the previous two. The methodology is retrospective as it relies, in part, on schedule updates but also uses forward looking calculations. It is not purely an observational technique in that the analyst is free to modify or create schedule updates based on other project documentation. As such, it is a dynamic logic method.

- **Common Names** – Names commonly associated with this technique include **Update Analysis**, **Reconstructed Update Analysis**, **Month-to-Month Analysis**, **Window Analysis** and **Schedule Windows Analysis**.

- **Minimum Source Validation Protocols** – At a minimum the schedule analyst must perform the following source validation protocols – Update Validation, Baseline Validation and As-Built Validation and possibly may have to perform a Modified Baseline Validation Protocol.

- **Minimum Implementation Protocols** – Minimally, this method must recognize all time extensions granted on the project. Activity(ies) used to track time losses and gains must be identified in the network. Separately, activities used to track other schedule network time losses or gains must also be identified. Finally, the analyst must use both the longest path and the least float criteria to identify the controlling chain of activities.

- **Specific Implementation Protocols**

  Fixed Periods – The analytical periods are identical in duration and may coincide with regular schedule updates

  Variable Periods – The analysis periods vary in duration (such as when the periods are tied to completion of project milestones) and are characterized by different types of work being performed, delaying influences and their impact on the schedule may change period to period.

- **Caveats and Limitations** – The all periods implementation is generally more precise than grouped periods. The grouped periods methodology may mask unfavorable events for the party performing such an analysis.

- **Modeled – Additive – Single Base**

  - **Description of Methodology** – This is a modeled methodology as it relies upon a simulation of a CPM model. The methodology consists of inserting or adding delaying activities into a schedule network representing the as-planned schedule. Thus, this is also an additive method. The single base method adds all delaying events to a single schedule and is, therefore, a static logic modeling technique. This method may be used prospectively or retrospectively. Prospectively the method predicts impacts while retrospectively the modeling technique analyzes outcome.

  - **Common Names** – The most common names associated with this methodology are the **Impacted As-Planned (IAP)**, **Impacted Baseline (IB)**, **As-Planned Plus Delay**, **Impacted Update Analysis**, **Time Impact Analysis (TIA)**, **Time Impact Evaluation (TIE), Fragnet Insertion** or **Fragnet Analysis,**

  - **Minimum Source Validation Protocols** – At a minimum the analyst must perform the following source validation protocols discussed earlier – Baseline Validation, Update Validation and Delay Identification and Quantification.

  - **Enhanced Source Validation Protocols** – The analyst may need to perform the As-Built Validation Protocol also.

  - **Minimum Implementation Protocols** – All contract time extensions must be recognized. There must be at least one continuous critical path using the longest path criterion. Each change to the baseline model to create the delay impacted model schedule must be documented and justified. The analyst must use the longest path and least float criteria to identify the controlling chain of activities.

  - **Enhanced Implementation Protocols** – A listing of known significant delays not incorporated into the model must be created. Comparison of the impacted schedule to the as-built schedule and explanation of any variances may be necessary.

  - **Specific Implementation Protocols**

    Global Insertion – All delay events are added together and the impact of the combined effect added in at one time.

    Stepped Insertion – Delays are added individually or in groups and impact determined after each addition.

  - **Other Extensions and Enhancements** – The analyst can use the simulation calendar to model the impact of actual weather on the unimpacted baseline schedule .

- **Caveats and Limitations** – This methodology cannot account for concurrent delays and may not be appropriate when evaluating compensable delays if compensation is not allowed in the event of concurrent delays.

➢ Modeled - Additive – Multiple-Base

- **Description of Methodology** – Again, this is a modeled method relying upon a simulation of a scenario based on a CPM model. This is an additive modeling technique relying upon the addition of events or impacts into the network to calculate the delay. This methodology is a multiple base method since the additive simulations are performed on multiple network analysis models. Each simulation creates a base model to delay quantification and serves as the base for the next simulation. It is a dynamic logic technique and retrospective in its application.

- **Common Names** – The methodology is variously referred to as a **Window Analysis, Schedule Windows Analysis**, **Impacted Update Analysis**, **Time Impact Analysis (TIA)**, **Time Impact Evaluation (TIE), Fragnet Insertion** or **Fragnet Analysis**.

- **Minimum Source Validation Protocols** – Minimum source validation protocols to be performed include the Baseline Validation, Update Validation and Delay Identification and Quantification.

- **Enhanced Source Validation Protocols** – The analyst may also need to perform the As-Built Validation Protocol.

- **Minimum Implementation Protocols** – All contract time extensions must be recognized. There must be at least one continuous critical path using the longest path criterion. Each change to the baseline to create the impacted as-planned schedule must be documented and justified. The analyst must use the longest path and least float criteria to identify the controlling chain of activities. A new analysis period must be established with each significant change in critical path activities. A tabulation that summarizes variances quantified during each period must be prepared and the total must result in a match with the project end date.

- **Enhanced Implementation Protocols** – A listing of known significant delays not incorporated into the model must be created. Comparison of the impacted schedule to the as-built schedule and explanation of any variances may be necessary. The analyst must use the accepted baseline, updates and schedule revisions.

- **Specific Implementation Protocols**

  <u>Fixed Periods</u> – Analysis periods all have the same duration and may coincide with regular schedule update periods.

  <u>Variable Periods</u> – Analysis periods have varying durations and are generally tied to specific project milestone dates or periods of time.

Global Insertion – All delay events and impacts are added together and entered at one time to determine the cumulative impact of all events.

Stepped Insertion – Delaying events and impacts are added individually or in groups and the impacts assessed after each insertion.

- **Other Extensions and Enhancements** – The analyst may choose to utilize the U.S. Army Corps of Engineers methodology outlined in their publication, Modification Impact Evaluation Guide.[10] The analyst may also choose to implement the Update Plus Delay technique as a comparison to the next update.

- **Caveats and Limitations** – This methodology on its own does not account for concurrent delay. It may not be appropriate when evaluating compensable delays if compensation is not allowed in the event of concurrent delays.

➢ **Modeled - Subtractive – Single Simulation**

- **Description of Methodology** – This methodology is a modeled technique relying on a simulation of a scenarios based on a CPM model. Unlike other modeling techniques, this methodology extracts or subtracts delays from a network representing the as-built schedule to determine the impact of the subtracted activities on the overall network. Hence, it is a subtractive model. This method is a single base model in that it subtracts all delaying events from a single as-built model. It is a static logic technique as it uses but one network analysis model – the as-built schedule – to perform the analysis. Finally, the methodology is typically employed in a retrospective manner but may be employed prospectively if the subtraction is made from the planned schedule versus the as-built.

- **Common Names** – This methodology is most commonly referred to as a **Collapsed As-Built (CAB), But For Analysis, As-Built Less Delay** or **Modified As-Built.**

- **Minimum Source Validation Protocols** – Source validation protocols which must be employed include an as-built validation, a delay identification and quantification validation and an as-built controlling path validation.

- **Enhanced Source Validation Protocols** – The enhanced source validation protocols to be performed may include both a baseline validation and an update validation.

- **Minimum Implementation Protocols** – All contract time extensions must be recognized. Each change made to the base impacted model to create the unimpacted schedule must be documented and justified. Both the base impacted model and the unimpacted model must be CPM logic driven and not just schedule graphics. The logic ties used to generate the base impacted model must conform to sound logic rules. The

[10] Modification Impact Evaluation Guide, U.S. Army Corps of Engineers, EP 415-1-3, Department of the Army, Office of the Chief of Engineers, Washington, D.C., 1979. While this publication was quietly withdrawn by the Corps of Engineers in 1997, it is still frequently used by North American practitioners.

base impacted model must contain both the critical as well as near critical activities; baseline critical path and longest path; all contractual milestones and predecessor activities; all activities alleged to show concurrent delay; and all delays for which a contract time extension has been awarded. The collapse process shall not involve any adjustment to logic or removal of constraints unless documented and justified. Finally, a constructability analysis of the collapsed as-built schedule must be performed to show it was achievable.

- **Enhanced Implementation Protocols** – Enhanced protocols include performing an analogous critical path reconciliation; reconciling the as-built and collapsed as-built critical paths to the as-planned critical path; and, creating a calendar based upon actual weather conditions.

- **Specific Implementation Protocols**

  Global Extraction – All delay events are added together and the impact of the combined effect subtracted at one time.

  Stepped Extraction – Delays are subtracted individually or in groups and impact determined after each extraction.

- **Caveats and Limitations** – This method, by itself, cannot be used to identify the as-built critical path.

Modeled - Subtractive – Multi Simulation

- **Description of Methodology** – Also a modeled technique, this relies upon a simulation of a situation based on a CPM model. As with the above method, this methodology likewise extracts delays from the as-built schedule to determine delay impact. As this is a multiple base method, extraction of delaying events involves multiple analysis networks. Each base model created is a period or window of analysis. This is a dynamic logic method and is also retrospective in application.

- **Common Names** – This methodology is variously referred to as **Window Analysis, Schedule Window Analysis, Windowed Collapsed As-Built** or **Modified Update.**

- **Minimum Source Validation Protocols** – Source validation protocols that should be performed include a baseline validation, as-built validation, update validation, as-built critical path validation and delay identification and quantification.

- **Minimum Implementation Protocols** – All contract time extensions must be recognized. Each change made to the base impacted model to create the unimpacted schedule must be documented and justified. Both the base impacted model and the unimpacted model must be CPM logic driven and not just schedule graphics. The logic ties used to generate the base impacted model must conform to sound logic rules. The base impacted model must contain both the critical as well as near critical activities;

baseline critical path and longest path; all contractual milestones and predecessor activities; all activities alleged to show concurrent delay; and all delays for which a contract time extension has been awarded. The collapse process shall not involve any adjustment to logic or removal of constraints unless documented and justified. Finally, a constructability analysis of the collapsed as-built schedule must be performed to show it was achievable.

- **Enhanced Implementation Protocols** -- Enhanced protocols include performing an analogous critical path reconciliation and reconciling the as-built and collapsed as-built critical paths to the as-planned critical path.

- **Specific Implementation Protocols**

  Fixed Periods – Analysis periods all have the same duration and may coincide with regular schedule update periods.

  Variable Periods – Analysis periods have varying durations and are generally tied to specific project milestone dates or periods of time.

  Global Extraction – All delay events are added together and the impact of the combined effect subtracted at one time.

  Stepped Extraction – Delays are subtracted individually or in groups and impact determined after each extraction. Note that stepping differs from windowing in that windows create a straight delineation of analysis periods whereas delays for each step extraction may not fit neatly into an existing analysis periods.

ANALYSIS EVALUATION PROTOCOLS

This section will offer guidelines on the evaluation and interpretations of the results obtained by the methods described above.

Concurrency of Delay

This section of the RP/FSA will contain a thorough discussion of the definition, concept and applicability of concurrent delay in a schedule delay analysis. Included in this section will be recognized tests for concurrency of delay and other discussion related to the impact of concurrent delay on the outcome of a delay analysis.

Float and Pacing

Definition of float, float ownership and float utilization, and the impact of float utilization on a forensic schedule analysis will be highlighted in this section of the RP/FSA.

- **Compensable Delay**

A brief discussion of delays typically considered as compensable, with examples, will be included in this section of the RP/FSA. Reliance upon typical North American industry interpretation and mainstream law will be the basis for this portion.

- **Excusable Delay**

A brief discussion of delays typically considered as excusable, non-compensable, with examples, will be included in this section of the RP/FSA. Reliance upon typical North American interpretation and mainstream law will be the basis for this portion.

- **Schedule Recovery, Delay Mitigation and Acceleration**

A discussion of the practical scheduling impacts of recovering or mitigating delay or accelerating the work of the project will be contained in the RP/FSA. Included in this section will be a discussion of how to find and demonstrate such impacts while performing a forensic schedule analysis.

- **Schedule Disruption**

The RP/FSA will include a discussion of the difference between impact and delay and how forensic scheduling can aid in documenting impact, including impact to otherwise unchanged work.

- **Interpreting Combined Methodologies**

The potential exists for an analyst to combine some of the methodologies identified in the RP/FSA. Accordingly, the RP/FSA will offer some guidance on which methodologies can be combined and which ought not to be combined with reasoning for each point.

- **Choosing a Method**

The RP/FSA will also offer some practical and pragmatic suggestions concerning methodology selection. Focus will be primarily on what level of documentation needs to exist in order to properly perform various forensic scheduling methods. Some discussion of the time to perform certain methods and the related cost may also be included in this section of the RP/FSA.

GLOSSARY

The RP/FSA will include a Glossary of scheduling related terms built, in the first instance, upon the existing 43 page glossary of Scheduling Terms published by AACEI's Education Board and included in the Planning and Scheduling Professional (PSP) Certification Preparation Workshop. The RP/FSA Task Force will supplement this existing document with terms specific to forensic scheduling analysis as required, but will not supply definitions for the common names of methods. Current usage of these common names is loose and undisciplined with many regional differences and even subject to dubious proprietary claims. Instead of attempting to enforce a more disciplined use of common names, the RP/FSA defines the common names indirectly by establishing a correlation between each taxonomic classification and associated common names.

BIBLIOGRAPHY

Finally, the RP/FSA will include a thorough bibliography of texts, papers and articles related to schedule delay analysis which will serve as a reference guide to users of the RP/FSA should they wish to delve more deeply into various areas of scheduling and forensic scheduling.

CONCLUSION

Going back to the original question posed, is schedule delay analysis simple? Absolutely not! AACEI's CDR Committee has concluded that this is an extremely complex subject. However, much of the complexity arises because of a lack of standard terminology and standard practices. It is believed that the RP/FSA will act as a platform for forensic scheduling practitioners to foster consistency of practice thus allowing forensic schedulers and their clients to focus on facts, leading to resolution, not continuation, of disputes concerning delay.

CAVEAT

This paper is the author's interpretation of the current internal discussion draft of the RP/FSA. The actual RP/FSA public comment draft will be available by June 2006 and the CDR Committee will meet twice at AACE International's Annual Meeting in Las Vegas, Nevada, U.S.A to discuss this draft RP/FSA. Whether one is a member of the Committee or AACE International or not, all are invited to participate in these Committee Meetings on June 20 and 21, 2006.