1. ORGANIZATION AND SCOPE ................................................................................................................................. 9
   1.1 Introduction ......................................................................................................................................................... 9
   1.2. Basic Premise and Assumptions ..................................................................................................................... 10
   1.3. Scope and Focus ................................................................................................................................................. 10
   1.4. Taxonomy and Nomenclature .......................................................................................................................... 11
      A. Layer 1: Timing .................................................................................................................................................. 13
         1. Prospective ...................................................................................................................................................... 13
         2. Retrospective .................................................................................................................................................. 13
      B. Layer 2: Basic Methods .................................................................................................................................... 13
         1. Observational ................................................................................................................................................. 13
         2. Modeled ......................................................................................................................................................... 14
      C. Layer 3: Specific Methods ............................................................................................................................... 14
         1. Observational Methods ............................................................................................................................... 14
            a. Static Logic Observation .......................................................................................................................... 14
            b. Dynamic Logic Observation .................................................................................................................. 14
         2. Modeled Methods ........................................................................................................................................... 14
            a. Additive Modeling ................................................................................................................................... 14
            b. Subtractive Modeling ............................................................................................................................. 15
      D. Layer 4: Basic Implementation .......................................................................................................................... 15
         1. Gross Mode or Periodic Model ..................................................................................................................... 15
         2. Contemporaneous / As-Is or Contemporaneous / Split ........................................................................... 15
         3. Modified or Revised ..................................................................................................................................... 15
         4. Single Base, Simulation or Multi-Base, Simulation .................................................................................... 16
      E. Layer 5: Specific Implementation ..................................................................................................................... 16
         1. Fixed Periods vs. Variable Periods / Grouped Periods ............................................................................ 16
         2. Global (Insertion or Extraction) vs. Stepped (Insertion or Extraction) ....................................................... 16
   1.5. Underlying Fundamentals and General Principles ............................................................................................ 17
      A. Underlying Fundamentals ............................................................................................................................... 17
      B. General Principles ............................................................................................................................................. 17
         1. Use CPM Calculations ..................................................................................................................................... 17
         2. Concept of Data Date Must be Used ........................................................................................................... 17
         3. Shared Ownership of Network Float ......................................................................................................... 17
         4. Update Float Preferred Over Baseline Float ............................................................................................... 18
         5. Sub-Network Float Values ........................................................................................................................... 18
         6. Delay Must Affect the Critical Path ............................................................................................................. 18
         7. All Available Schedules Must Be Considered ............................................................................................ 18

2. SOURCE VALIDATION ............................................................................................................................................... 18
2.1. Baseline Schedule Selection, Validation, and Rectification (SVP 2.1) ................................................................. 19
   A. General Considerations .............................................................................................................................. 19
   B. Recommended Protocol ........................................................................................................................... 19
   C. Recommended Enhanced Protocol ......................................................................................................... 20
   D. Special Procedures .................................................................................................................................. 21
       1. Summarization of Schedule Activities ............................................................................................... 21
       2. Reconstruction of a Computerized CPM Model from a Hardcopy ....................................................... 21
       3. De-Statusing a Progressed Schedule to Create a Baseline ................................................................... 22
       4. Software Format Conversions ............................................................................................................. 22

2.2. As-Built Schedule Sources, Reconstruction, and Validation (SVP 2.2) ................................................................. 23
   A. General Considerations .............................................................................................................................. 23
   B. Recommended Protocol ........................................................................................................................... 24
   C. Recommended Enhanced Protocol ......................................................................................................... 25
   D. Special Procedures .................................................................................................................................. 25
       1. Creating an Independent As-Built from Scratch “Daily Specific As-Built” (DSAB) ............................ 25
       2. Creating a Fully Progressed Baseline ................................................................................................. 27
       3. Determination of ‘Significant’ Activities for Inclusion in an As-Built .................................................. 27
       4. Collapsible As-Built CPM Schedule .................................................................................................. 28
       5. Summarization of Schedule Activities ............................................................................................... 28

2.3. Schedule Updates: Validation, Rectification, and Reconstruction (SVP 2.3) .......................................................... 28
   A. General Considerations .............................................................................................................................. 28
   B. Recommended Protocol ........................................................................................................................... 29
   C. Recommended Enhanced Protocol ......................................................................................................... 29
   D. Special Procedures .................................................................................................................................. 29
       1. Reconstructed Updates .......................................................................................................................... 29
          a. “Hindsight” Method .......................................................................................................................... 30
          b. “Blindsight” Method .......................................................................................................................... 30
       2. Bifurcation: Creating a Progress-Only Half-Step Update ..................................................................... 30
       3. Correcting the Contemporaneous Project Schedule for the Analysis ................................................. 30

2.4. Identification and Quantification of Discrete Delay Events and Issues (SVP 2.4) ..................................................... 32
   A. General Considerations .............................................................................................................................. 32
   1. ‘Delay’ Defined ....................................................................................................................................... 33
      a. Activity-Level Variance (ALV) ............................................................................................................. 33
      b. Distinguishing ALV from Project-Level Variance (PLV) .................................................................. 34
      c. Distinguishing Delay-Cause from Delay-Effect .................................................................................. 34
      d. Delay Characterization is Independent of Responsibility ................................................................. 34
   2. Identifying and Collecting Delays ............................................................................................................. 34
      a. Two Main Approaches to Identification and Collection .................................................................... 34
      b. Criticality of the Delay ........................................................................................................................ 35
   3. Quantification of Delay Durations and Activity Level Variances ............................................................ 35
      a. Variance Method .................................................................................................................................. 35
      b. Independent Method ............................................................................................................................ 35
   4. Cause of Variance ................................................................................................................................... 36
   5. Assigning or Assuming Variance Responsibility ..................................................................................... 36
      a. Contractor Delay ................................................................................................................................. 36
      b. Owner Delay ..................................................................................................................................... 37
      c. Force Majeure Delay ........................................................................................................................... 37
B. Recommended Protocol .................................................................................................................. 37
C. Recommended Enhanced Protocol .................................................................................................. 38
D. Special Procedures ............................................................................................................................ 38
   1. Duration and Lag Variance Analysis ............................................................................................... 38

3. METHOD IMPLEMENTATION ........................................................................................................... 38

3.1. Observational / Static / Gross (MIP 3.1) ........................................................................................ 39
   A. Description ........................................................................................................................................ 39
   B. Common Names ................................................................................................................................. 39
   C. Recommended Source Validation Protocols .................................................................................... 40
   D. Enhanced Source Validation Protocols ............................................................................................ 40
   E. Minimum Recommended Implementation Protocols .......................................................................... 40
   F. Enhanced Implementation Protocols .................................................................................................. 41
      1. Daily Delay Measure ....................................................................................................................... 41
   G. Identification of Critical and Near-Critical Paths ............................................................................. 41
   H. Identification and Quantification of Concurrent Delays and Pacing ............................................... 42
      1. Excusable and Compensable Delay (ECD) ..................................................................................... 42
      2. Excusable and Non-Compensable Delay (END) ......................................................................... 42
   I. Determination and Quantification of Excusable and Compensable Delay ........................................ 43
      1. Excusable and Compensable Delay (ECD) ..................................................................................... 43
      2. Excusable and Non-Compensable Delay (END) ......................................................................... 43
   J. Identification and Quantification of Mitigation / Constructive Acceleration .................................... 44
   K. Specific Implementation Procedures and Enhancements .................................................................. 44
   L. Summary of Considerations in Using the Minimum Protocol ......................................................... 44
   M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols .................. 44

3.2. Observational / Static / Periodic (MIP 3.2) ...................................................................................... 45
   A. Description ........................................................................................................................................ 45
   B. Common Names ................................................................................................................................. 45
   C. Recommended Source Validation Protocols .................................................................................... 46
   D. Enhanced Source Validation Protocols ............................................................................................ 46
   E. Minimum Recommended Implementation Protocols .......................................................................... 46
   F. Enhanced Implementation Protocols .................................................................................................. 48
      1. Daily Delay Measure ....................................................................................................................... 48
   G. Identification of Critical and Near-Critical Paths ............................................................................. 48
   H. Identification and Quantification of Concurrent Delays and Pacing ............................................... 49
   I. Determination and Quantification of Excusable and Compensable Delay ........................................ 49
      1. Excusable and Compensable Delay (ECD) ..................................................................................... 49
      2. Excusable and Non-Compensable Delay (END) ......................................................................... 49
   J. Identification and Quantification of Mitigation / Constructive Acceleration .................................... 50
   K. Specific Implementation Procedures and Enhancements .................................................................. 50
      1. Fixed Period .................................................................................................................................. 50
      2. Variable Periods .............................................................................................................................. 50
   L. Summary of Considerations in Using the Minimum Protocol ......................................................... 51
   M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols .................. 51

3.3. Observational / Dynamic / Contemporaneous As-Is (MIP 3.3) ..................................................... 52
   A. Description ........................................................................................................................................ 52
   B. Common Names ................................................................................................................................. 52
   C. Recommended Source Validation Protocols .................................................................................... 53
   D. Enhanced Source Validation Protocols ............................................................................................ 53
   E. Minimum Recommended Implementation Protocols .......................................................................... 53
F. Enhanced Implementation Protocols ............................................................................................................. 54
G. Identification of Critical and Near-Critical Paths ............................................................................................. 55
H. Determination and Quantification of Concurrent Delays and Pacing ............................................................. 55
I. Identification and Quantification of Excusable and Compensable Delay ....................................................... 55
   1. Non-Excusable and Non-Compensable Delay (NND) .................................................................................. 56
   2. Excusable and Compensable Delay (ECD) ................................................................................................. 56
   3. Excusable and Non-Compensable Delay (END) ......................................................................................... 56
J. Identification and Quantification of Mitigation / Constructive Acceleration .................................................... 56
K. Specific Implementation Procedures and Enhancements ................................................................................ 57
   1. All Periods .................................................................................................................................................. 57
   2. Grouped Periods ....................................................................................................................................... 57
   3. Blocked Periods ....................................................................................................................................... 57
   4. Changing the Contemporaneous Project Schedule During the Analysis .................................................. 57
L. Summary of Considerations in Using the Minimum Protocol ......................................................................... 58
M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols ............................... 58

3.4. Observational / Dynamic / Contemporaneous Split (MIP 3.4) ........................................................................ 59
   A. Description ............................................................................................................................................... 59
   B. Common Names ....................................................................................................................................... 59
   C. Recommended Source Validation Protocols ............................................................................................. 60
   D. Enhanced Source Validation Protocols .................................................................................................... 60
   E. Minimum Recommended Implementation Protocols .................................................................................. 60
   F. Enhanced Implementation Protocols ........................................................................................................ 61
   G. Identification of Critical and Near-Critical Paths ....................................................................................... 61
   H. Identification and Quantification of Concurrent Delays and Pacing ......................................................... 62
   I. Determination and Quantification of Excusable and Compensable Delay .................................................. 62
   J. Identification and Quantification of Mitigation / Constructive Acceleration ................................................ 62
   K. Specific Implementation Procedures and Enhancements ........................................................................... 62
      1. All Periods ............................................................................................................................................ 63
      2. Grouped Periods .................................................................................................................................. 63
      3. Blocked Periods .................................................................................................................................. 63
      4. Bifurcation: Creating a Progress-Only Half-Step Update ...................................................................... 63
      5. Changing the Contemporaneous Project Schedule During the Analysis .......................................... 65
   L. Summary of Considerations in Using the Minimum Protocol ..................................................................... 65
   M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols ........................... 66

3.5. Observational / Dynamic / Modified or Recreated (MIP 3.5) ......................................................................... 66
   A. Description ............................................................................................................................................... 66
   B. Common Names ....................................................................................................................................... 67
   C. Recommended Source Validation Protocols ............................................................................................. 67
   D. Enhanced Source Validation Protocols .................................................................................................... 67
   E. Minimum Recommended Implementation Protocols .................................................................................. 68
   F. Enhanced Implementation Protocols ........................................................................................................ 68
      1. Daily Progress Method .......................................................................................................................... 68
   G. Identification of Critical and Near-Critical Paths ....................................................................................... 68
   H. Identification and Quantification of Concurrent Delays and Pacing ......................................................... 69
   I. Determination and Quantification of Excusable and Compensable Delay .................................................. 69
   J. Identification and Quantification of Mitigation / Constructive Acceleration ................................................ 69
   K. Specific Implementation Procedures and Enhancements ........................................................................... 69
      1. Fixed Periods ....................................................................................................................................... 69
      2. Variable Periods .................................................................................................................................. 70
3. Fixed Periods vs. Variable Periods .......................................................... 70
L. Summary of Considerations in Using the Minimum Protocol ....................................................... 70
M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols .................. 70

3.6. Modeled / Additive / Single Base (MIP 3.6) ............................................. 71
A. Description ........................................................................................................... 71
B. Common Names .................................................................................................... 72
C. Recommended Source Validation Protocols .......................................................... 72
D. Enhanced Source Validation Protocols ................................................................. 72
E. Minimum Recommended Implementation Protocols ............................................... 72
F. Enhanced Implementation Protocols ....................................................................... 73
G. Identification of Critical and Near-Critical Paths .................................................... 73
H. Identification and Quantification of Concurrent Delays and Pacing ................................. 74
I. Determination and Quantification of Excusable and Compensable Delay ......................... 74
   1. Excusable and Compensable Delay (ECD) ............................................................ 74
   2. Non-Excusable and Non-Compensable Delay (NND) ........................................... 75
   3. Excusable and Non-Compensable Delay (END) .................................................... 75
J. Identification and Quantification of Mitigation / Constructive Acceleration ....................... 75
K. Specific Implementation Procedures and Enhancements ............................................... 75
   1. Global Insertion .................................................................................................... 75
   2. Stepped Insertion ................................................................................................. 76
L. Summary of Considerations in Using the Minimum Protocol ............................................ 76
M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols ......... 76

3.7. Modeled / Additive / Multiple Base (MIP 3.7) ............................................. 77
A. Description ........................................................................................................... 77
B. Common Names .................................................................................................... 77
C. Recommended Source Validation Protocols .......................................................... 77
D. Enhanced Source Validation Protocols ................................................................. 77
E. Minimum Recommended Implementation Protocols ............................................... 77
F. Enhanced Implementation Protocols ....................................................................... 78
G. Identification of Critical and Near-Critical Paths .................................................... 78
H. Identification and Quantification of Concurrent Delays and Pacing ................................. 79
I. Determination and Quantification of Excusable and Compensable Delay ......................... 79
   1. Excusable and Compensable Delay (ECD) ............................................................ 80
   2. Non-Excusable and Non-Compensable Delay (NND) ........................................... 81
   3. Excusable and Non-Compensable Delay (END) .................................................... 81
J. Identification and Quantification of Mitigation / Constructive Acceleration ....................... 82
K. Specific Implementation Procedures and Enhancements ............................................... 82
   1. Fixed Periods .................................................................................................... 82
   2. Variable Periods ................................................................................................. 82
   3. Global Insertion ................................................................................................. 82
   4. Stepped Insertion ............................................................................................... 82
L. Summary of Considerations in Using the Minimum Protocol ............................................ 82
M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols ......... 83

3.8. Modeled / Subtractive / Single Simulation (MIP 3.8) ............................... 83
A. Description ........................................................................................................... 83
B. Common Names .................................................................................................... 84
C. Recommended Source Validation Protocols .......................................................... 84
D. Enhanced Source Validation Protocols ....................................................................... 84
4. ANALYSIS EVALUATION

3.9. Modeled / Subtractive / Multiple Base (MIP 3.9)

A. Description ......................................................... 91
B. Common Names .................................................. 92
C. Recommended Source Validation Protocols ................. 92
D. Enhanced Source Validation Protocols ......................... 92
E. Minimum Recommended Implementation Protocols ........ 92
F. Enhanced Implementation Protocols .......................... 92
G. Identification of Critical and Near-Critical Paths for Each Periodic Update .............................................. 93
H. Identification and Quantification of Concurrent Delays and Pacing ............................................................ 94
I. Determination and Quantification of Excusable and Compensable Delay ......................................................... 94
   1. Excusable and Compensable Delay (ECD) .................... 95
   2. Non-Excusable and Non-Compensable Delay (NND) ...... 95
   3. Excusable and Non-Compensable Delay (END) .......... 95
J. Identification and Quantification of Mitigation / Constructive Acceleration ..................................................... 95
K. Specific Implementation Procedures and Enhancements .......................................................... 95
   1. Choice of Analysis Periods ............................................. 95
      a. Fixed Periods ..................................................... 95
      b. Variable Periods ............................................... 95
      c. Fixed Periods vs. Variable Periods ........................ 96
   2. Order of Analysis Periods ............................................ 96
   3. Choice of Modeling Increments .................................... 96
      a. Periodic Modeling .................................................. 96
      b. Cumulative Modeling ............................................. 97
   4. Choice of Extraction Modes ......................................... 98
      a. Global Extraction .................................................. 98
      b. Stepped Extraction ............................................... 98
   5. Creating a Collapsible As-Built CPM Schedule ............... 99
   6. Identification of the Analogous Critical Path (ACP) ........ 99
L. Summary of Considerations in Using the Minimum Protocol ....................................................... 99
M. Caveats in Using the Minimum Protocol / Conditions Requiring Enhanced Protocols ......................... 91
4.1. Excusability and Compensability of Delay

A. General Rules .......................................................................................................................... 100
B. Accounting for Concurrent Delay .......................................................................................... 100
C. Equitable Symmetry of the Concept ..................................................................................... 102

4.2. Identification and Quantification of Concurrent Delay

A. Relevance and Application ........................................................................................................ 103
B. Various Definitions of Concurrency ....................................................................................... 103
C. Pre-Requisite Findings Concerning the Delays Being Evaluated for Concurrency .......... 104
   1. Two or More Delays that are Unrelated and Independent .................................................. 104
   2. Two or More Delays that are the Contractual Responsibility of Different Parties .......... 105
   3. The Delay Must be Involuntary ......................................................................................... 105
   4. The Delay Must be Substantial and Not Easily Curable .................................................... 105
D. Functional Requirements Establishing Concurrency and the Factors that Influence Findings 105
   1. Literal Concurrency vs. Functional Concurrency .............................................................. 106
   2. Least Float vs. Negative Float ............................................................................................ 108
   3. Cause of Delay vs. Effect of Delay .................................................................................... 108
   4. Frequency, Duration, and Placement of Analysis Intervals ............................................. 109
      a. Frequency and Duration ................................................................................................. 109
      b. Chronological Placement .............................................................................................. 110
   5. Order of Insertion or Extraction in Stepped Implementation ........................................... 110
   6. Hindsight vs. Blindsight ..................................................................................................... 110
E. Defining the Net Effect of Concurrent Combinations of Delay ........................................... 112
F. Pacing ...................................................................................................................................... 113
G. Demonstrating Pacing ........................................................................................................... 114
   1. Existence of the Parent Delay ......................................................................................... 115
   2. Showing of Contemporaneous Ability to Resume Normal Pace .................................... 115
   3. Evidence of Contemporaneous Intention ........................................................................ 115

4.3. Critical Path and Float ........................................................................................................ 115

A. Identifying the Critical Path .................................................................................................. 115
   1. Critical Path: Longest Path School vs. Total Float Value School .................................. 115
   2. Negative Float: Zero Float School vs. Lowest Float Value School ................................. 116
B. Quantifying ’Near-Critical’ .................................................................................................. 116
   1. Duration of Discrete Delay Events .................................................................................. 117
   2. Duration of Each Analysis Interval ................................................................................. 117
   3. Historical Rate of Float Consumption ............................................................................ 118
   4. Amount of Time or Work Remaining on the Project ......................................................... 118
C. Identifying the As-Built Critical Path ................................................................................... 118
D. Common Critical Path Alteration Techniques ...................................................................... 120
   1. Resource Leveling and Smoothing ................................................................................... 120
   2. Multiple Calendars .......................................................................................................... 120
   3. Precedence Logic / Lead and Lag .................................................................................... 121
   4. Start and Finish Constraints ........................................................................................... 121
   5. Various Calculation Modes ............................................................................................. 121
      a. Schedule Calculation .................................................................................................... 121
      b. Duration Calculation ................................................................................................... 122
   6. Use of Data Date .............................................................................................................. 122
   7. Judgment Calls During the Forensic Process .................................................................. 122
E. Ownership of Float .............................................................................................................. 122
4.4. Delay Mitigation and Constructive Acceleration

A. Definitions

B. General Considerations

1. Differences between Directed Acceleration, Constructive Acceleration, and Delay Mitigation

2. Acceleration and Compensability

3. Delay Mitigation and Compensability

C. Elements of Constructive Acceleration

1. Contractor Entitlement to an Excusable Delay

2. Contractor Requests and Establishes Entitlement to a Time Extension

3. Owner Failure to Grant a Timely Time Extension

4. Implied Order by the Owner to Complete More Quickly

5. Contractor Notice of Acceleration

6. Proof of Damages

5. CHOOSING A METHOD

5.1 Factor 1: Contractual Requirements

5.2 Factor 2: Purpose of Analysis

5.3 Factor 3: Source Data Availability and Reliability

5.4 Factor 4: Size of the Dispute

5.5 Factor 5: Complexity of the Dispute

5.6 Factor 6: Budget for Forensic Schedule Analysis

5.7 Factor 7: Time Allowed for Forensic Schedule Analysis

5.8 Factor 8: Expertise of the Forensic Schedule Analyst and Resources Available

5.9 Factor 9: Forum for Resolution and Audience

5.10 Factor 10: Legal or Procedural Requirements

5.11 Factor 11: Custom and Usage of Methods on the Project or the Case

REFERENCES

CONTRIBUTORS

APPENDIX A: FIGURE 1 – NOMENCLATURE CORRESPONDENCE FIGURE

APPENDIX B: FIGURE 2 – TAXONOMY OF FORENSIC SCHEDULE ANALYSIS
1. ORGANIZATION AND SCOPE

1.1. Introduction

The purpose of the AACE® International Recommended Practice 29R-03 Forensic Schedule Analysis is to provide a unifying reference of basic technical principles and guidelines for the application of critical path method (CPM) scheduling in forensic schedule analysis. In providing this reference, the RP will foster competent schedule analysis and furnish the industry as whole with the necessary technical information to categorize and evaluate the varying forensic schedule analysis methods. The RP discusses certain methods of schedule delay analysis, irrespective of whether these methods have been deemed acceptable or unacceptable by courts or government boards in various countries around the globe.

This RP is not intended to establish a standard of practice, nor is it intended to be a prescriptive document applied without exception. Therefore, a departure from the recommended protocols should not be automatically treated as an error or a deficiency as long as such departure is based on a conscious and sound application of schedule analysis principles. As with any other recommended practice, the RP should be used in conjunction with professional judgment and knowledge of the subject matter. While the recommended protocols contained herein are intended to aid the practitioner in creating a competent work product it may, in some cases, require additional or fewer steps.

AACE recognizes that the method(s) of analysis to be utilized in a given situation, and the manner in which a particular methodology might be implemented, are dependent upon the contract, the facts, applicable law, availability and quality of contemporaneous project documentation, and other circumstances particular to a given situation. Therefore, the RP should be read in its entirety and fully understood before applying or using the information for any purpose. The reader should refrain from using the RP in a manner which is not consistent with its intended use, and not quote any of the contents in an out-of-context manner. As with any other recommended practice published by AACE, this RP is subject to future revisions as new methodologies are identified; new forensic scheduling software is developed; etc.

Forensic scheduling analysis refers to the study and investigation of events using CPM or other recognized schedule calculation methods. It is recognized that such analyses may potentially be used in a legal proceeding. It is the study of how actual events interacted in the context of a complex model for the purpose of understanding the significance of a specific deviation or series of deviations from some baseline model and their role in determining the sequence of tasks within the complex network.

Forensic schedule analysis, like any other technical fields, is both a science and an art. As such, it relies upon professional judgment and expert opinion and usually requires many subjective decisions. One of the most important of these decisions is what technical approach should be used to measure or quantify delay and identify the affected activities in order to focus on causation. Equally important is how the analyst should apply the chosen method. The desired objective of this RP is to reduce the degree of subjectivity involved in the current state of the art. This is with the full awareness that there are certain types of subjectivity that cannot be minimized, let alone eliminated. Professional judgment and expert opinion ultimately rest on subjectivity, but that subjectivity must be based on diligent factual research and analyses whose procedures can be objectified.

For these reasons, the RP focuses on minimizing procedural subjectivity. It does this by defining terminology, identifying methodologies currently used by forensic scheduling analysts, classifying them, and setting forth recommended procedural protocols for the use of these techniques. By describing uniform procedures that

---

1 The word ‘forensic’ is defined as: 1. Relating to, used in, or appropriate for courts of law or for public discussion or argumentation. 2. Of, relating to, or used in debate or argument; rhetorical. 3. Relating to the use of science or technology in the investigation and establishment of facts or evidence in a court of law: a forensic laboratory.[9] relating to, or used in debate or argument; rhetorical. 3. Relating to the use of science or technology in the investigation and establishment of facts or evidence in a court of law: a forensic laboratory.[9]
increase the transparency of the analytical method and the analyst’s thought process, the guidelines set forth herein will increase both the accountability and the testability of an opinion and minimize the need to contend with “black-box” or “voodoo” analyses.

Implementation of this RP should result in minimizing disagreements over technical implementation of accepted techniques and allow the providers and consumers of these services to concentrate on resolving disputes based upon substantive, factual and legal issues.

1.2. Basic Premise and Assumptions

a. Forensic scheduling is a technical field that is associated with, but distinct from, project planning and scheduling. It is not just a subset of planning and scheduling.

b. Procedures that may be sufficient for the purpose of project planning, scheduling, and controls may not necessarily be adequate for forensic schedule analysis.

c. It is assumed that this document will be used by practitioners to foster consistency of practice and be used in the spirit of intellectual honesty.

d. All methods are subject to manipulation as they all involve judgment calls by the analyst whether in preparation or in interpretation.

e. No forensic schedule analysis method is exact. The level of accuracy of the answers produced by each method is a function of the quality of the data used therein, the accuracy of the assumptions, and the subjective judgments made by the forensic schedule analyst.

f. Schedules are a project management tool that, in and of themselves, do not demonstrate root causation or responsibility for delays. Legal entitlement to delay damages should be distinct and apart from the forensic schedule analysis methodologies contained in this RP.

1.3. Scope and Focus

The scope and focus of this RP are:

a. This RP covers the technical aspects of forensic schedule analysis methods. It identifies, defines, and describes the usage of various forensic schedule analysis methods in current use. It is not the intent of the RP to exclude or to endorse any method over others. However, it offers caveats and considerations for usage and cites the best current practices and implementation for each method.

b. The focus of this document is on the technical aspects of forensic scheduling as opposed to the legal aspects. This RP is not intended to be a primary resource for legal factors governing claims related to scheduling, delays, and disruption. However, relevant legal principles are discussed to the extent that they would affect the choice of techniques and their relative advantages and disadvantages.

c. Accordingly, the RP primarily focuses on the use of forensic scheduling techniques and methods for factual analysis and quantification as opposed to assignment of delay responsibility. This, however, does not preclude the practitioner from performing the analysis based on certain assumptions regarding liability.

d. This RP is not intended to be a primer on forensic schedule analysis. The reader is assumed to have advanced,
hands-on knowledge of all components of CPM analysis and a working experience in a contract claims environment involving delay issues.

e. This RP is not intended to be an exhaustive treatment of CPM scheduling techniques. While the RP 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.

f. This RP is not intended to override contract provisions regarding schedule analysis methods or other mutual agreement by the parties to a contract regarding the same. However, this is not an automatic, blanket endorsement of all methods of delay analysis by the mere virtue of their specification in a contract document. It is noted that contractually specified methods often are appropriate for use during the project in a prospective mode but may be inappropriate for retrospective use.

g. It is not the intent of this RP to intentionally contradict or compete with other similar protocols. All efforts should be made by the user to resolve and reconcile apparent contradictions. AACE requests and encourages all users to notify AACE and bring errors, contradictions, and conflict to its attention.

h. This RP deals with CPM-based schedule analysis methods. It is not the intent of the RP to exclude analyses of simple cases where explicit CPM modeling may not be necessary, and mental calculation is adequate for analysis and presentation. The delineation between simple and complex is admittedly blurry and subjective. For this purpose, a ‘simple case’ is defined as any CPM network model that can be subjected to mental calculation whose reliability cannot be reasonably questioned and allows for effective presentation to lay persons using simple reasoning and intuitive common sense.

i. Finally, the RP is an advisory document to be used in conjunction with professional judgment based on working experience and knowledge of the subject matter. It is not intended to be a prescriptive document that can be applied without exception. When used as intended, this RP will aid the practitioner in creating a competent work product, but some cases require additional steps and some require less. Thus, a departure from the recommended protocols should not be automatically treated as an error or a deficiency as long as such departure is based on a conscious and sound application of schedule analysis principles.

1.4. Taxonomy and Nomenclature

The industry knows the forensic schedule analysis methods and approaches described herein by various common names. Current usage of these names throughout the industry is loose and undisciplined. It is not the intent of this document to enforce more disciplined use of the common names. Instead, the RP will correlate the common names with a taxonomic classification. This taxonomy will allow for the freedom of regional, cultural, and temporal differences in the use of common names for these methods.

The RP correlates the common names for the various methods to taxonomic names much like the biosciences use Latin taxonomic terms to correlate regionally diverse common names of plants and animals. This allows the common variations in terminology to coexist with a more objective and uniform language of technical classification. For example, the implementation of method implementation protocol (MIP) 3.7 (aka “TIA”) has a bewildering array of regional variations. Not only that, the method undergoes periodic evolutionary changes while maintaining the same name.

---

2 For example, the prospective mode of “Time Impact Analysis” method that inserts estimated delay fragments into the current schedule update for the purpose of contemporaneously demonstrating entitlement to time extensions.

3 The only other similar protocol known at this time is the “Delay & Disruption Protocol” issued in October 2002 by the Society of Construction Law of the United Kingdom [1]. The DDP has a wider scope than this RP.
By using taxonomic classifications, the RP allows the discussion of the various forensic analysis methods to become more specific and objective. Thus, the RP will not provide a uniform definition for the common names of the various methods, but it will instead describe in detail the taxonomic classification in which they belong. Figure 1 – Nomenclature Correspondence shows the commonly associated names for each of the taxonomic classifications.

The RP’s taxonomy is a hierarchical classification system of known methods of schedule impact analysis techniques and methods used to analyze how delays and disruptions affect entire CPM networks. For example, methods like the window analysis and collapsed as-built are included in the taxonomy, while procedures such as fragnet modeling, bar charting, and linear graphing are not included. Procedures are tools, not methods, and therefore are not classified under this taxonomy.

The taxonomy is comprised of five layers: timing, basic and specific methods, and the basic and specific implementation of each method. Please refer to Figure 2 – Taxonomy of Forensic Schedule Analysis for a graphic representation of the taxonomy. The elements of the diagrams are explained below.

Footnotes
1. Contemporaneous or Modified / Reconstructed
2. The single base can be the original baseline or an update.

Figure 1 – Nomenclature Correspondence (see enlarged size figure in Appendix A)

Figure 2 – Taxonomy of Forensic Schedule Analysis (see enlarged size figure in Appendix B)