Alpha Corporation

Construction Delay & Disruption: Using Symptoms to Develop Appropriate Claims Avoidance Documentation

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D&D: Symptoms, Support & Mitigation

- Alpha Corporation
  - Engineering & construction manager/consultant
  - CM firm – 45th Largest U.S. CM firm by ENR
  - Program Manager – 28th Largest U.S. PGM by ENR
  - Provide CM services; scheduling, schedule review, claims analysis, claims defense, all other services
  - Work for Owners, CMs, Contractors

Alpha Corporation

Alpha Corporation

- CM Roles
  - Jefferson Lab Accelerator Expansion
  - APM Terminals, VA Port Authority
  - National Park Service
- Schedule Review Services
  - Miami International Airport
  - VDOT Projects
  - State Department, Overseas Operations
- Scheduling
  - Fort Lee Dining Hall
  - Harbor Heights Condominiums
  - Kings Fork High School
  - Pentagon 9-11 Restoration
- Neutral Mediation Support
  - Ohio School Facilities Commission
- Dispute Resolution Services
  - VDOT, MDOT, DCDOT
  - State Department
  - Meydan Racecourse, Dubai
- Risk Management Services
  - King Abdullah Financial District, Saudi Arabia

D&D: Symptoms, Support & Mitigation

- Rob Kelly Jr., PMP, PSP, CFCC
  - Senior Project Manager
  - Project Controls Manager, Ohio
  - Alpha Corporation – Dublin, OH
  - Active in AACEI, PMI
    - Southwestern Ohio Chapter – AACEi
    - Certified Forensic Claims Consultant
  - 21 years of construction management /consulting experience

D&D: Symptoms, Support & Mitigation

- Chris Carson, PSP, CCM, PMP
  - Corporate Director of Project Controls
  - Alpha Corporation - Norfolk, VA
  - Active in PMI College of Scheduling, AACEi, CMAA
    - Vice President of Scheduling Excellence, PMI CoS
    - Managing Director, PMI-CoS SEI (Scheduling Excellence Initiative) writing Best Practices & Guidelines for Scheduling
  - Active in AACEi
    - Author, AACEi, Schedule Recovery Recommended Practice
    - Co-Author, AACEi, Schedule Design & Identifying the Critical Path RPs
  - Active in CMAA
    - Member of CMAA Editorial Team, Revision of Time Management Chapter of CM Standards of Practice
  - Chief U.S. Editor, Planning Planet Accreditation Team
  - 37 years of construction management experience

D&D: Symptoms, Support & Mitigation

Current Experience with Delay & Disruption Claims

- Nature of Claims
- Improved Contractor Understanding
- Misleading Methodology Implementation
- Claims Phrases and Calculations
- Strong Cause, Unsupported Effect
- Failure to Follow Contract

D&D: Symptoms, Support & Mitigation

What is "Delay & Disruption"?

Event

Result

Results of Delay easy to spot

Results of Disruption can be very difficult, not just to identify, but also to evaluate once identified

Difference between Delay and Disruption

- Delay
  - Delay is related to <u>when</u> an activity is performed
  - Delay involves slippage of any activity, no matter the criticality
    - Although this is the definition of delay, often delay implies Critical Path delay
  - Critical Path Delay involves slippage of any Contract Milestone, interim or completion, that extends the contractual completion date
- Disruption
  - Disruption is related to <u>how</u> an activity is performed
  - Disruption can occur without slippage of any activities
  - Disruption can still occur during slippage of any activities including Contract Milestones

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Schedule 'Impact'

'Notice'

<silence or chatter>

CLAIM

$$

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Notice of the Potential Results:

- *"…Tasks will be inefficient, possible shift work will be required, as well as overtime, additional crews, additional supervision, and additional equipment. The School Board is responsible for these costs…"*
- *"…Work will have to be accelerated…"*
- *"…Under these circumstances we are unable to complete even one task in an efficient productive manner…"*

Actual Contractor Claims Submission Quotes

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What is “Inefficiency”? “Acceleration”?

Do these introduce or detail impact?

Difference between Delay and Disruption

- Concept of Disruption
  - "*An Interference (action or event) with the orderly progress of a project or activity(ies*).
  - "*Schedule disruption is any unfavorable change to the schedule that may, but does not necessarily, involve delays to the critical path or delayed project completion.*"
  - *"Disruption has been described as the effect of change on unchanged work which manifests itself primarily as adverse labor productivity impacts."*

Quotes from AACEi's Forensic Schedule Analysis Recommended Practice

Concept of Critical Path Delay

- Critical Path Delay
  - Technical CPM concept supported by case law
  - Claimant must show delays in the Critical Path that forced late completion of Milestones to prevail on a CP delay claim
  - Simple slippage of any Non-Critical activities is not Critical Path delay
  - Showing slippage without reference to the Critical Path is a weak argument, not generally favored in litigation, and unlikely to win

Concept of Critical Path Delay

- Disruption as related to CP Delay
  - Disruption includes all types of non-Critical Path slippage
  - Disruption may include Critical Path delay that was mitigated (but not recognized) such that the completion milestone was not delayed
  - A project may have Critical Path delay for a number of months but is brought back to on-time completion, and still be subject to disruption claims
  - Disruption and Critical Path Delay can exist on the same project at the same time
  - Disruption may be identified by specific issues, but is more likely to arise when the contractor discovers a significant project cost overrun
  - Disruption may be claimed by the General Contractor, the Trade Contractors, or the CM at Risk

Concept of Disruption & Productivity

- Concept of Disruption
  - Disruption involves labor, but sometimes equipment and materials, cost overruns for a variety of reasons:
    - *Inefficiency*
    - *Learning curves issues*
    - *Dilution of supervision*
    - *Trade stacking*
    - *Overcrowding*
    - *Overtime*
    - *Workforce size*
    - *Morale*
    - *Fatigue*
    - *Duration compression*
    - *Loss of productivity*
    - *Rework*
    - *Craft turnover*
    - *Absenteeism*
    - *Weather*
    - *Project conditions*
    - *Availability of skilled workers*
    - *Cumulative effect of changes*
    - *Project size*
    - *Out-of-sequence work*

Concept of Disruption & Productivity

- Concept of Disruption
  - "*Contractors experience a loss of productivity when their work is disrupted*." Mark Sanders & Mark Nagata, from paper, "Assessing Methodologies for Quantifying Lost Productivity", AACE 2003 Transactions
  - "*A claim of "low productivity" is not likely to prevail*." from RP 25R-03 Estimating Lost Labor Productivity In Construction Claims
  - "*Disruption arising out of force majeure events must normally be borne by the contractor*." Wright A. Zink, from paper, "Windfall Profits", AACE 1995 Transactions

Concept of Disruption & Productivity

- Concept of Productivity
  - Production is the measure of output (meters of pipe installed)
  - Productivity is the measurement of the production (labor hours to install one meter of pipe)
  - A Contractor might meet planned production but not meet planned productivity (install 100 m of pipe, but spend double labor to do so)
  - Most disruption involves low productivity (lower than planned)
  - Activity Original Duration is established by a quantity times a production rate
  - The Contractor has a right to meet its planned production rate, if possible
  - Anything that interferes with that rate can be construed as a loss of planned productivity, note, however, the planned production rate must be reasonable and achievable

Concept of Disruption & Productivity

- Concept of Productivity
  - Productivity usually not monitored
  - If production is not met, usually causes a delay at the activity level (Actual Duration increases)
  - If productivity not met, often not recognized contemporaneously
  - Productivity, and loss of productivity, is often calculated after the work is done

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Big Problem with “Delay & Disruption” Claims?

INSUFFICIENT SUPPORT

Notice, compliant or not, followed by failure to maintain records supporting actuality of previously forewarned impact (result)

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Failure to generate records supporting actual results of forewarned impact leads to….

Inability to demonstrate the effect of alleged impact

CAUSE AND EFFECT

Merely warning (Notice) that there will be damages, and then saying (Claim) that there were damages, often fails to carry the burden of proof (Weak documentation).

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Weak Attempts at Empirical "Effect"

Few or No Actual Examples (no documentation)

Industry Reference Calculations (lack of relevance)

Added Resource or Total Cost Calculations (TCC unlikely to prevail in court, or in negotiations)

Mis-applied Measured Mile (strong technique when implemented appropriately)

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- Typical Loss of Productivity Claim (generally prepared by attorney)
  - Period of Disruption: May 1, 2003 through August 30, 2003
  - Loss of productivity: ½ hour for every hour worked in concrete trade
  - Identification of total labor during period: 12,000 hours
  - Calculations: ½ hour * 12,000 hours = 6,000 hours lost
  - Average labor cost: $24.00/hour, applied to hours lost

  - **Loss of Productivity Claim = $144,000**

(This is often the complete productivity claim with only support using total payrolls)

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In order to be well positioned in defense of a D&D Claim

Symptoms
+
Support
+
Mitigation (efforts)
=
Reasonable response or defense

D&D: Symptoms

Obvious Symptoms

- *Schedule Impact*
- *Notice*
- *Continued Notice*
- *Refusal to Sign Schedule(s) or waivers*
- *Claims Consultant brought in*

Subtle Symptoms

- *Idle Resources*
- *Over-manning*
- *Temporary Resources*
- *Added Supervision*
- *Rumor Mill*

D&D: Support

Support – What to Do?

General Considerations

- *Contract Process*
  - *Timing*
  - *Content*
  - *Estimate of Impact*
- *Nature of the Notice*
- *Scale of the Potential Claim*
- *Reasonable Assessment of Liability*
- *Contractor Capability*
- *Lines of Communication*
- *Judicial Environment*

D&D: Support

Support – What to Do?

Inefficiency, Loss of Efficiency, Acceleration

- *Baseline productivity information*
- *Measured Mile information*
- *Daily resource confirmation*
- *Performance tracking*
- *Supervision*
- *Daily coordination*

- *Photographs, videos of daily conditions*

D&D: Support

Support – What to Do?

Baseline Productivity Information

- *Often sensitive information*
  - *Confidentiality agreements*
- *Platform from which to identify and quantify impact*
- *Enables properly-targeted daily performance tracking*

- *Crew productivity with definition*
- *Resource loaded schedules*
- *Need resources to evaluate acceleration/disruption*

D&D: Support

Support – What to Do?

Measured Mile Information

- *Targeted Impact*
- *Recognized performance periods*
- *Enables properly-targeted daily performance tracking*

D&D: Support

Support – What to Do?

Daily Resource Tracking

- *Check-in, check-out badge procedure*
- *Iris-scan records*
- *Daily activity coordination*
- *Cost engineering / daily performance tracking*

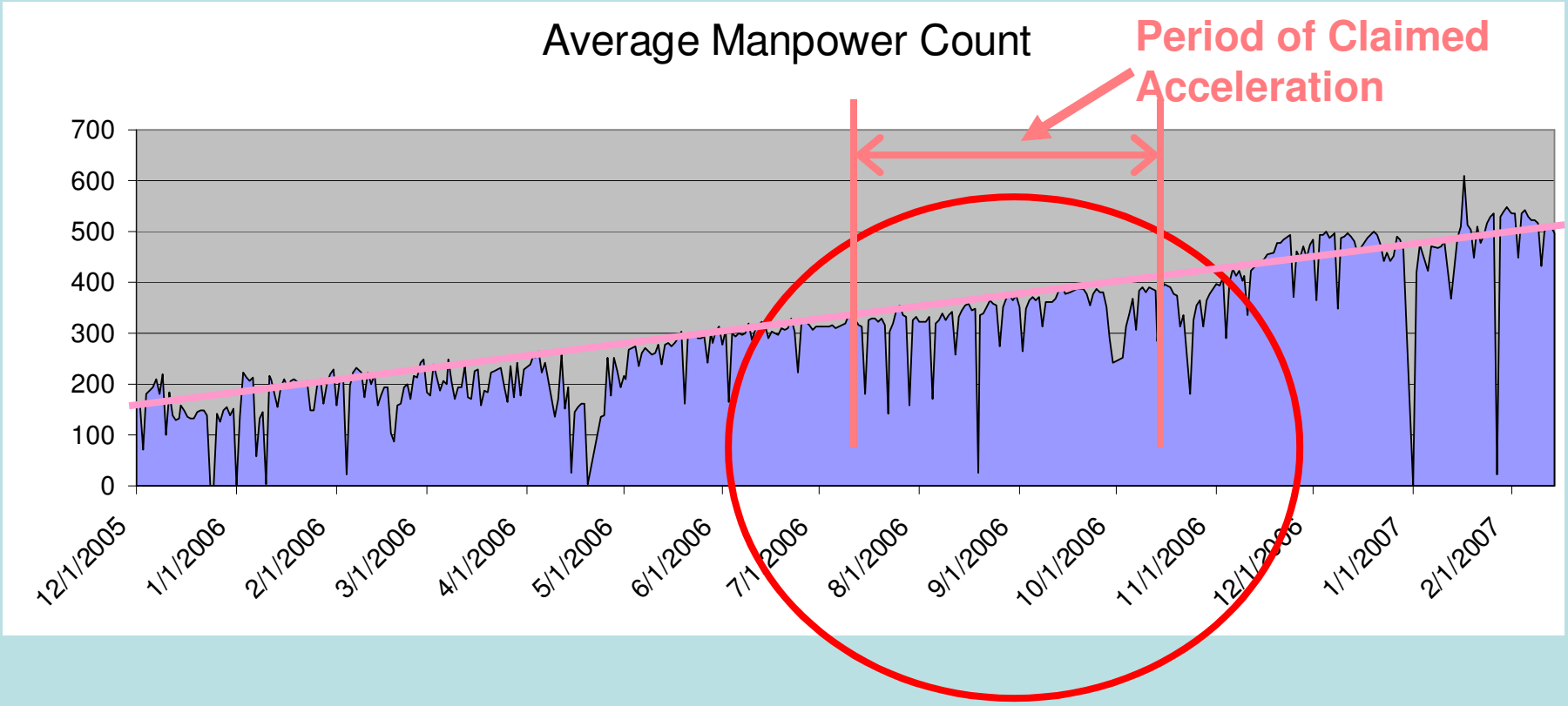
Identify labor force on-site, task availability and effective assignment

Schedule Review and Claims Avoidance

- "Since there is no available document which states the original level of manpower anticipated by the Contractor, Alpha can only review this available data for trends that would indicate the Contractor had an original plan, had been following it, and then initiated a sudden increase of manpower to respond to some of the alleged issues of acceleration. Note that in fact the rate of increase for manpower is steady from December 2005 to November 2006. The average manpower on site increases at a rate of approximately 24 personnel per day during this period. There are no apparent spikes in manpower at any point during this period. By way of demonstrating this, refer to the Contractor's August 2006 Schedule Narrative, in which they state that they intended to increase manpower in the month of August by 100 people, and maintain that level of manning until October 2006. As the chart demonstrates, no such spike occurred. In fact, the average daily manpower on August 1, 2006 was 324, and a total increase of 100 people was not achieved until the middle of November 2006. The claim of acceleration does not correspond with the contemporaneous records."

Alpha Corporation Schedule Review Report, 2007, Response to $14M claim for delay and acceleration

Schedule Review and Claims Avoidance



Resource Tracking to Analyze and Defeat False Acceleration Claim

D&D: Support

Support – What to Do?

Performance Tracking

- *Daily production reports*
  - *Specific activities, associated labor force and hours, installation quantities, special observations affecting conditions*
- *Assignment, re-assignment, idle time observations*
  - *Daily task assignments: when, where, why and how long?*
  - *Daily re-sequencing efforts*
  - *Separate productive from non-productive time*

Empirical productivity information for reference and use in response to future delay and disruption claim

D&D: Support

Support – What to Do?

Photographs and Videos of Daily Conditions

- *Recording performance, crowding, idle time, etc.*
  - *May support greater productivity*

Evidence to support nature of response to future delay and disruption claim

D&D: Mitigation

Mitigation

- *Reasonable Assessment of Liability*
- *Contract Specifications*
  - *Contractor Submission(s)*
  - *Owner Response(s)*
- *Partnered, Parallel Approach*
- *Ensure Understanding of 'Impact'*
- *Targets versus Blankets*

- *Contractor generally has an obligation to mitigate delay and disruption*

Mitigation Strategy - Preconstruction

- Contract Documents
  - Clear Statement of Owner's Program
  - Allow Adequate Design Time
  - Ensure Clear Definition of Scope
  - Use Constructability Reviews
  - Monitor & Control Design Schedule
  - Appropriate Use of Specification Type
    - Performance specification
    - Design specification
  - Fair allocation of risk, assign risk to party best able to control the risk

Mitigation Strategy - Preconstruction

- Contract Documents
  - Define Cost Control Requirements
    - Integrated Cost & Schedule System
    - Establish a Cost Baseline
      - Good Cost Estimates
      - Require Bid Preparation Documentation
    - Reasonable Cost Contingency
    - Appropriate schedule risk management

Mitigation Strategy - Construction

- Contract Administration
  - Clean up Issues in a Timely Manner
    - No lingering cost issues
    - No lingering time issues
    - Contract documents should finalize issues monthly
  - Payment Issues
    - Keep the appropriate money flowing
    - Do not allow overpayment
    - Do not allow inappropriate early payment
    - Do allow mobilization & start-up costs
    - Incentive for achieving schedule approval

Mitigation Strategy - Construction

- Schedule Administration
  - Schedule Review
    - Require electronic version of schedule
    - Require good scheduling software
    - In-depth review and approval process
    - Require schedule capable of providing for monitoring & control
    - Require regular periodic updates (monthly typical)
    - Contractor required to incorporate comments
  - Personnel
    - Require expertise in scheduling
    - CPM Methodology as well as software expertise

Mitigation Strategy - Construction

- Failure to submit complete updates

"In addition to this, the Updated Schedule was last updated in December 04. As such, there is a large gap of time, approximately 30% of the total contract duration, in between the last update and this alleged delay. This means that the Updated Schedule as presented here has relatively little usefulness as a tool to judge any delay conditions. Without the most current progress entered into the schedule, it is impossible to analyze the effects of any issues that may or may not change the CCD. Finally, Alpha has had no means of verifying the veracity of the claimed progress shown on the Updated Schedule, which shows a Percent Complete of 70% and notes that this REA cannot be judged objectively without reviewing the changes and causal activities in the Critical Path during the long period of no updates, while the Contractor is asserting that Owner caused delays during this period warrant compensation."

Alpha Corporation Schedule Review Report, 2006, Contractor submitted a REA for $400,000

Mitigation Strategy - Construction

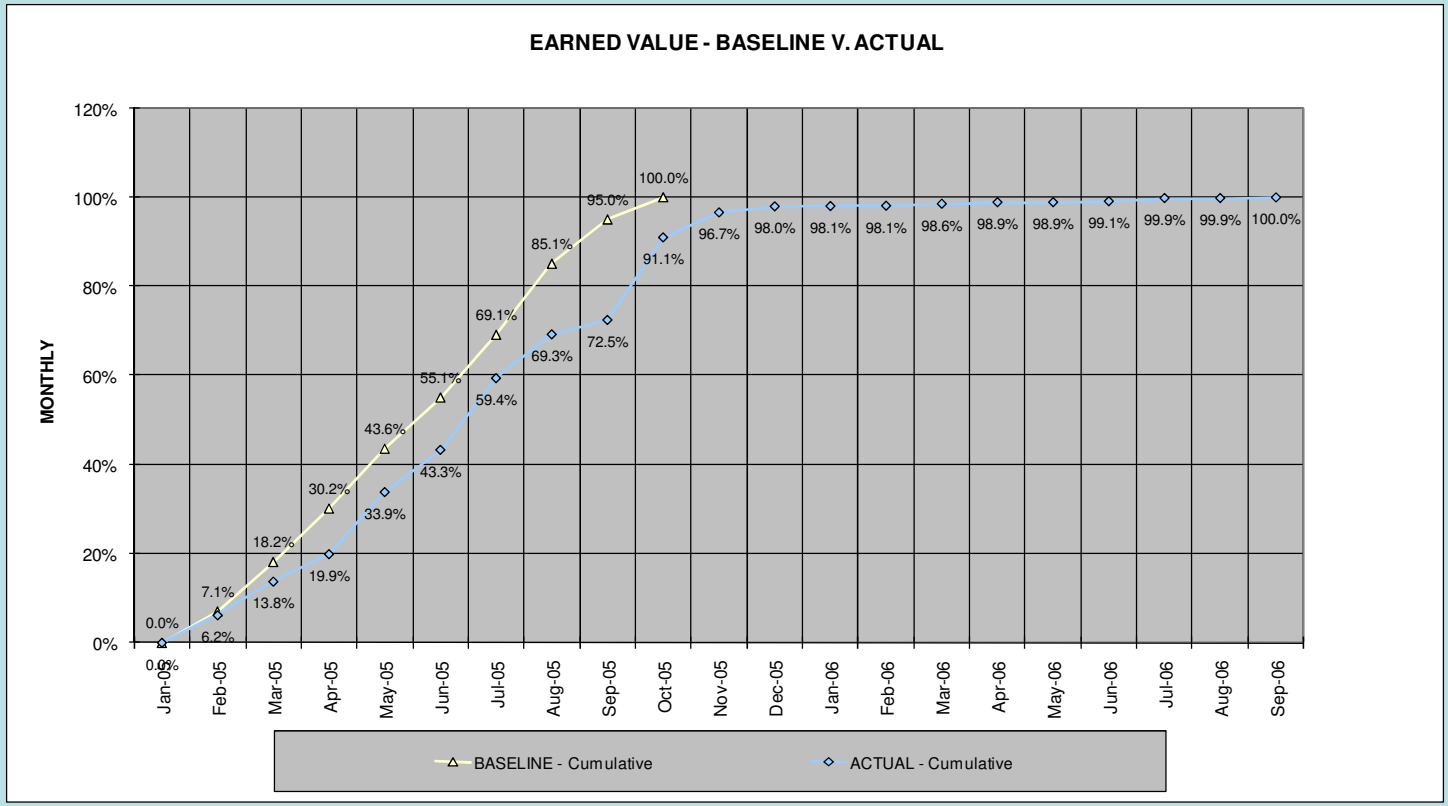
- Schedule Administration
  - Change Management System
    - Incorporate system
    - Require and monitor use of system
    - Provide timely and appropriate responses
  - Avoid Constructive Acceleration
    - Require Time Impact Analyses at the time of the delay
    - Review and negotiate appropriate time extensions
    - Review and negotiate change
  - Effective Negotiation Process

Mitigation Strategy - Construction

- Schedule Administration
  - Recognizing Late Performance
    - Have a process in place
    - Require response to first recognition of late performance
  - Steps to Improve Late Performance
    - Work with Contractor
    - Do not allow process to languish
    - Schedule-based effort for recovery
    - Show steps in revised schedule
    - Require approval of revised schedule
    - Require timeliness of submitted revised schedule
  - Everyone gains with effective scheduling

Punch List & Completion Activities

- Completion work problems
  - *Some projects last forever in the completion stage*



Claims Avoidance through Good Schedule Review Practices

- Good Practices
  - Get an approved schedule in place as soon as possible
  - Confirm that schedule is reasonable and attainable
  - Understand Contractor's Means & Methods (Narrative)
  - Establish a good baseline for monitoring
  - Ensure schedule is a good model of the project plan
  - Verify resources, durations, logic and sequencing
  - Identify claims positioning issues
  - Identify risks in schedule and assumptions
  - Provide good project documentation
  - Provide schedules that support accurate analysis
  - Document concerns & interact with Contractor to make corrections (team up on schedule)

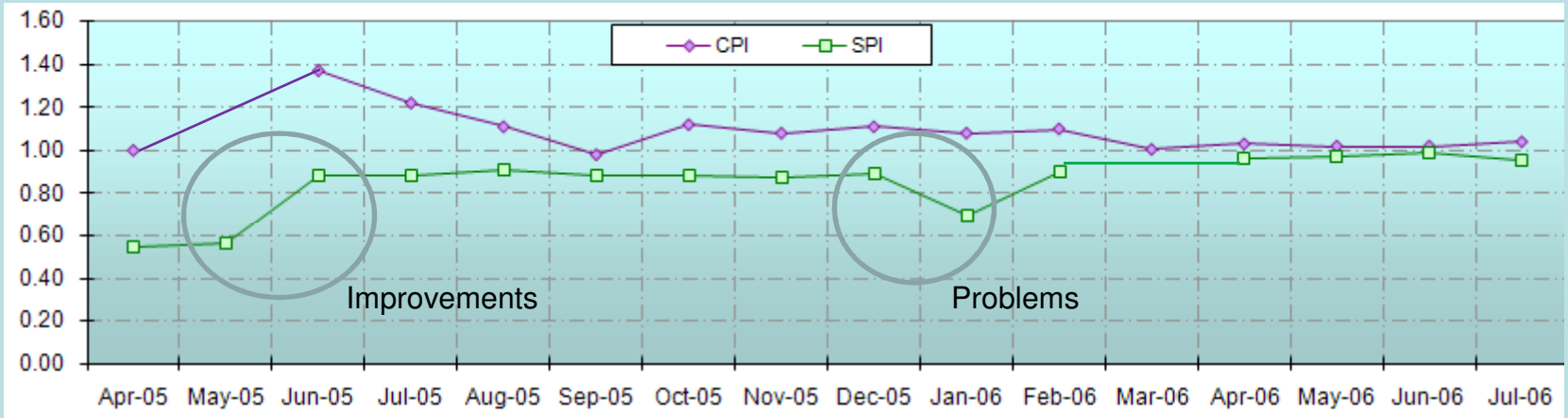
Claims Avoidance through Good Schedule Review Practices

- Effective Schedule Reviews Provide Claims Avoidance
  - Issues resolved contemporaneously
  - Memories still accurate
  - Less emotion involved in issues
  - Physical ability to look at problems
  - Project documentation kept up minimizes claims generated from Contractor's cost overruns at end of project
  - Accurate analysis for trending and completion predictions identifies problems well in advance of impacts
  - Analysis includes Earned Value for Non-Critical Path problems
    - Run by trade
    - Run by location
    - Use to identify low performance

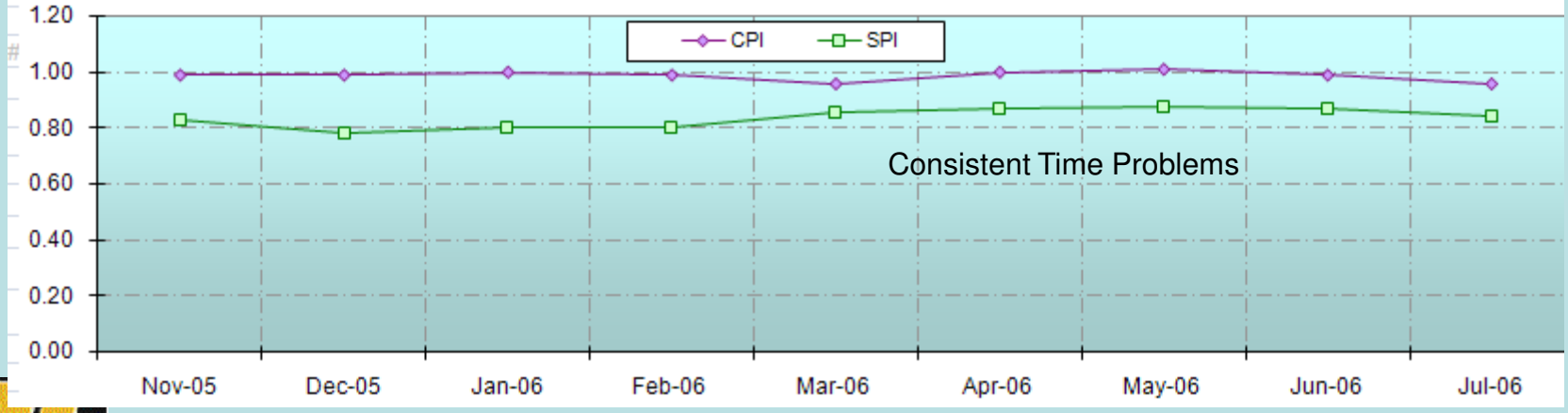
Earned Value "Value"

Separating Earned Value curves by trade or location will show very different results from project average Earned Value metrics

HVAC



ELEC



Claims Avoidance through Good Schedule Review Practices

- How Reviews Provide Claims Avoidance
  - Resources, resources, resources
    - Original plan (baseline)
    - Actual usage (update consumption)
  - Resource usage monitored and “controlled”
    - Minimizes losses from inefficiency
    - Allows accurate analysis of acceleration and loss of productivity
    - Use crew resources rather than individual resources
  - Good coordination reduces back-charges and additional costs
  - Time extensions reduce threat of Liquidated Damages and risk of constructive acceleration claims

Schedule Review

410360	L2 E LAB: TAPE & FINISH CEIL & BH'S	6	0	1	02MAY12	08MAY12	0	
430260	L2 D LAB: TAPE & FINISH PARTITIONS	10	0	1	02MAY12	15MAY12	0	
500260	L3 F LAB: TAPE & FINISH PARTITIONS	10	0	1	16MAY12	30MAY12	0	
256420	ATR L2: TAPE & FINISH FACE WALKWAY BULKHEADS	6	0	1	30MAY12	05JUN12	0	
510260	L3 E LAB: TAPE & FINISH PARTITIONS	15	0	1	31MAY12	20JUN12	0	
560260	L3 N OFF: TAPE & FINISH PARTITIONS	7	0	1	04JUN12	12JUN12	0	
560260	L3 S OFF: TAPE & FINISH PARTITIONS	7	0	1	13JUN12	21JUN12	0	
510360	L3 E LAB: TAPE & FINISH CEIL & BH'S	6	0	1	21JUN12	28JUN12	0	
200260	LG F OFF: TAPE & FINISH PARTITIONS	7	0	1	22JUN12	02JUL12	0	
259080	ATRIUM LV2: HANG DRYWALL UNDER L3 WALKWAYS	8	0	1	11MAY12	22MAY12	0	
510220	L3 E LAB: HANG DRYWALL PARTITIONS	8	0	1	15MAY12	24MAY12	0	
256410	ATR L2: HANG DRYWALL FACE WALKWAY BULKHEADS	4	0	1	23MAY12	29MAY12	0	
550220	L3 N OFF: HANG DRYWALL PARTITIONS	5	0	1	25MAY12	01JUN12	0	

Figure 7 - Stacked Resources at Risk

Wall & Ceiling Crew		
+ SUBSTRUCTURE		
+ STRUCTURE STEEL		
ENCLOSURE		
24000	NORTH: L1 TO L4 PERIMETER STUDS & SHEATHING	
24300	EAST C-G: L1 TO L4 PERIMETER STUDS & SHEATHING	
24600	EAST L-P: L1 TO L4 PERIMETER STUDS & SHEATHING	
24900	SOUTH 1-10: L1 TO L4 PERIMETER STUDS & SHEATHING	
22410	PENTHOUSE: NORTH PERIMETER STUDS & SHEATHING	
25200	LG NORTH: PERIMETER STUD WALLS/SOFITS & SHEATH	
22420	PENTHOUSE: EAST PERIMETER STUDS & SHEATHING	
25200	EAST G-K: L1 TO L4 PERIMETER STUDS & SHEATHING	
25800	ATRIUM: SKYLIGHT/PARPET STUDS & SHEATHING	
25400	LG EAST: PERIMETER STUD WALLS/SOFITS & SHEATH	
22430	PENTHOUSE: SOUTH PERIMETER STUDS & SHEATHING	
25300	SOUTH ENTRY: DEMO PHASE 1 STUD WALL ALONG CL X-5	
25540	SOUTH ENTRY: STUDS & SHEATHING ALONG CL X-5	
22440	PENTHOUSE: WEST PERIMETER STUDS/SHEATHING	
25600	LG SOUTH: PERIMETER STUD WALLS/SOFITS & SHEATH	
25800	ATRIUM ENTRY: DEMO PH1 STUD WALL ALONG CL X-5	
25840	ATRIUM ENTRY: STUDS & SHEATHING ALONG CL X-5	

Figure 11 Stacked Resources for Concurrent Work

ha loaded one crew per activity for the major trades in a copy of the schedule ent resource planning sorted by Early Start Date, it is discovered that the y for several trades is extremely high. For example as shown in the figure in the middle of January 2012, 63 crews are planned to be working on the , in the middle of February of 2012, 37 Electrical crews and 31 architectural e forecasted to be working on the peak day. Figure 10 below shows the total s planned for each day in the month of January 2012. During the entire month chanical crews working on the project. This re-emphasizes the issue that if the ese planned resources, the project may slip resulting in a delay to the job.

for Mechanical, Electrical and Architectural crew assignment for the job.

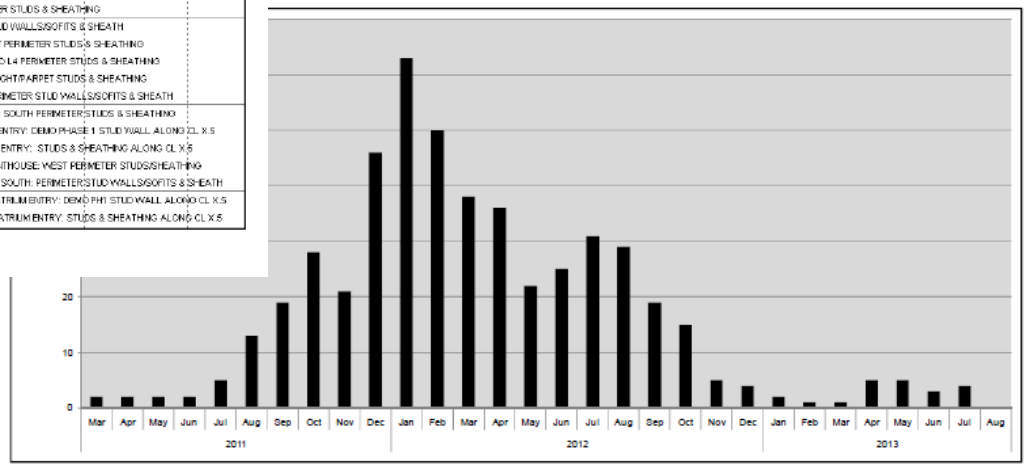


Figure 8 Mechanical Crews Forecast

Claims Avoidance through Good Schedule Review Practices

- Claims Avoidance Lessons Learned
  - Claims often come out of Contractor cost overruns, and review provides claims avoidance opportunities
  - Coordination issues not resolved result in claims
  - Failure to provide time extensions promote acceleration claims
  - Failure to track completion date affects end users
  - Some Contractors are claims oriented, and take advantage of the system
  - Some Contractors are claims adverse, and don't take into account real delays and disruptions

Suggestions

- Resources
  - Get involved with the PMI College of Scheduling SEI (Scheduling Excellence Initiative) Project developing Best Practices and Guidelines for Scheduling
    - http://www.pmicos.org
  - Get involved with AACEi (Association for the Advancement of Cost Engineering International) and the Recommended Practices development
    - http://www.aacei.org
  - Get involved with CMAA (Construction Management Association of America)
    - http://cmaanet.org

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Questions?

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