

# The Role of the Scheduler: Before, During & After



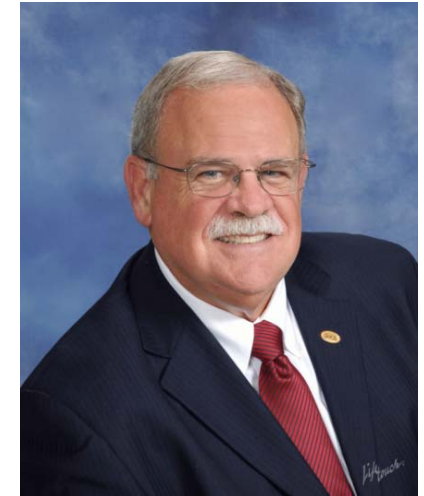
NAVIGANT

Construction Forum™

Building on the lessons learned in construction dispute avoidance and resolution.™



- Executive Director, Navigant Construction Forum™  
*“The construction industry’s premier resource for thought leadership & best practices on avoidance & resolution of construction project disputes globally”*
- 40+ years experience in construction management & dispute analysis & resolution
- Involved in more than 5,000 claims throughout U.S., Canada, Egypt, Chile, China, Guatemala, Germany, Kazakhstan, Kuwait, Netherlands, Peru, Saudi Arabia, Russian Federation, Trinidad & Tobago, Australia, India & Venezuela
- Fellow of AACE International & Royal Institution of Chartered Surveyors
- Former President, AACE International; founder of CDR Committee; executive sponsor of PSP, CEP, EVP & CFCC Certifications; author of RP 25R-03; sponsor of & contributor to RP 29R-03
- CCM, CFCC & PMP



# What is a Schedule?



- Model / plan of how project will be accomplished
- Connects scope, work estimates & deadlines into logic network
  - ✓ With realistic, achievable sequences & activity durations
  - ✓ Based on realistic resource allocations
  - ✓ & well thought out risk analysis

# What is a Scheduler?



- Project controls professional
- Works as part of project team to help
  - ✓ Plan
  - ✓ Schedule
  - ✓ Monitor
  - ✓ Close out
- Projects with respect to time management, and
- Perform forensic schedule analysis, as needed

# Who Owns the Schedule?



- The project team
- It is team's schedule
- It is NOT your schedule!

# Do All Projects Have Schedules?



➤ **Absolutely not!**

➤ **CIOB Study**

✓ **Only 14% of UK projects use fully linked CPM networks**

- 8% had partially linked network schedules

✓ **Remaining 78% of projects used**

- Bar (Gantt) Charts – 54%

- Time Chainage Diagrams – 1%

- Flow Charts – 3%

- Meeting Minutes – 11%

- Correspondence – 9%

# Do All Projects Have Schedules?



## ➤ Australian study

- ✓ Less than 10% of projects have fully developed logic diagrams

## ➤ Pat Galloway paper

- ✓ “CPM Scheduling & How the Industry Views Its Use”
  - Only 48% of owners require CPM schedules
  - Only 33% of contractors use CPM when not required to do so

# Why Do Project Schedules Fail?



1. No schedule, inadequate schedule, intuitive scheduling
2. No WBS identifying all activities
3. Poor / little understanding of scope of work
4. No / poor estimate of resources & productivity
5. Little / no involvement of subs & suppliers
6. No risk analysis during planning stage
7. Poor communication within team & with owner
8. Unrealistic estimate of project progress
9. No notices of delay
10. Lack of top management involvement & support



# Role of the Scheduler



- **Planning**
- **Project design**
- **Project execution**
- **Project closeout**
- **Forensic schedule analysis**

# Planning Phase Answers Following Questions



- What? – Define project scope
- How? – Establish Work Breakdown Structure (WBS)
- Who? – Establish resources (people, capital assets, equipment, subcontractors, etc.)
- When? – Establish sequence, logic & duration for each activity & roll up into network
- How much? – Determine budget for each activity, work package or group of tasks

# During Planning Phase Schedulers Should Assist Project Team



## ➤ Facilitate

- ✓ Preparation of project plan & WBS
- ✓ Estimate of timelines & project phases
- ✓ Identification of key project results & milestones

## ➤ Work with team members to

- ✓ Complete project plan
- ✓ Assess project risks with potential to delay project

## ➤ Involve client in defining project goals & key results

# Keys to Scheduler Success During Planning Phase



- Review all project documents, learn scope of work
- Study contract provisions impacting time
- Do not take over planning & scheduling process
  - ✓ Allow project team to lead process
- Do not challenge team thinking
  - ✓ Guide process by intensive & focused questioning

# Schedulers Role in Scheduling Phases



- Help team develop methodologies, techniques & scheduling tools
- Provide support & schedule controls for team
- Ensure schedule controls appropriately implemented & maintained
- Assist team in establishing realistic & achievable baseline schedule

# Schedule Development



**Purpose** – To implement project schedule by converting plan into logical arrangement & sequence of activities

➤ **Scheduler must**

- ✓ **Initiate schedule development**
- ✓ **Obtain input from**
  - **Project team**
  - **Stakeholders**
  - **Contract schedule specifications**
  - **Output of planning process**
- ✓ **Help develop detailed project schedule**

# Schedule Development



- **Scheduler & project team must**
  - ✓ Avoid intuitive scheduling
  - ✓ Allow software to perform mathematical functions
- **Scheduler must review outcome with team & subs**
  - ✓ Identify schedule problems to team
  - ✓ Do not attempt to correct the problems
  - ✓ Participate in discussion of potential solutions
  - ✓ Await team decision & direction
- **Perform quality analysis & sanity check of schedule**
  - ✓ Does it meet contract scheduling requirements?
  - ✓ Assist team in performing “constructability” analysis

# Schedule Management & Control



**Purpose** – Implement schedule procedures & processes required to maintain schedule during project execution

➤ **Schedule management includes –**

- ✓ **Progress updates**
- ✓ **Critical path & near critical path analysis**
- ✓ **Schedule change management**
- ✓ **Forecasts & recovery plans**
- ✓ **Progress reporting**
- ✓ **Providing required deliverables**



# Schedule Management & Control



## Actions to be taken –

- Track actual progress
  - ✓ Do not update by % of time expended method
- Variances & trends
- Changes that impact schedule
- Forecast remaining durations & schedule EAC
- Develop recovery schedules
- Prepare alternate courses of action, as needed
- Prepare objective schedule progress reports
  - ✓ Report honestly to project team

# Schedule Management & Control



## Role of scheduler –

- “Recorder of progress & history”
- “Eyes & ears” of project team
- **Schedule management & control involves –**
  - ✓ Implement schedule management & control procedures
  - ✓ Maintain schedule during execution phase
- **Track actual progress – do not update by % time expended method**
- **Assess critical path & near critical path activities**
  - ✓ Report to project team routinely

# Schedule Management & Control



## What is a critical / near critical path activity?

- **Any activity**
  - ✓ **Not meeting productivity rates such that project will complete later than planned unless corrected**
  - ✓ **That requires unattainable, unmanageable resources**
  - ✓ **Whose late completion will cause late completion**
- **Monitor, report on schedule deviations & variances**
- **Assist in developing alternative methods for corrective action**

# Schedule Management & Control



- **Perform cost analysis of potential alternatives to determine cost / benefit tradeoff**
  - ✓ **Present recommendations to project team**
- **Revise schedule as directed by project manager**
  - ✓ **Communicate changes to all team members & client, as required**

# Schedule Coordination & Communication



- Attend all meetings
- Respond to schedule questions & comments
- Respond to schedule review questions, comments
- Work closely with cost engineers, quantity surveyors, estimators, material management personnel to fully integrate cost & schedule

# Schedule Change Management



- **Revise approved baseline or schedule updates**
  - ✓ **Only when change order / contract modification indicates change of scope or project duration**
  - ✓ **Or, when events have overtaken project & schedule must be rebaselined**
- **Archive all schedules & updates as historical record of project**
- **Provide recommendations to project team on strategies to recover from delays**
- **Resist requests to “schedule away delays”!**

# Schedule Reports & Deliverables



- Perform routine schedule analysis
- Provide periodic schedule reports / updates to team
- Issue status updates & approved revision to schedule that reflect –
  - ✓ Actual work progress (not % time elapsed)
  - ✓ Actual time elapsed
  - ✓ Reasonable forecast of project completion date
  - ✓ Provide Schedule EAC (aka – earned schedule) =  
**Actual Duration + Estimated Duration of  
To Date Remaining Work**

# Schedule & Project Closeout



- **Verify & submit as-built schedule accurately**
  - ✓ Reflect accurate, documented start & completion dates for each schedule activity
- **Prepare closeout report for schedule**
  - ✓ Highlight & document events, slippages, etc.
  - ✓ Can use for forensic scheduling as needed
- **Review contract for close out requirements related to schedule**
  - ✓ Comply fully with such requirements



# Forensic Scheduling



- Retrospective, “look back” scheduling
- Determines what activities caused late completion
  - ✓ Who was responsible for activities
- “Compensability” – time &/or \$\$ - flow from analysis
  - ✓ In accordance with terms of contract
- Forensic scheduling unlike project scheduling
  - ✓ Not plan & track progress
  - ✓ But, often done initially by project scheduler
- Numerous forensic scheduling methods
  - ✓ Different methods reach different conclusions

# Forensic Scheduling – 1<sup>st</sup> Step



➤ Choose a method – 9 generally recognized methods

## ✓ Observational

- Static, Gross (**As-Planned v As-Built**)
- Static, Periodic
- Dynamic, Contemporaneous, All Periods
- Dynamic, Contemporaneous, Grouped
- Dynamic, Reconstructed

(Windows)

## ✓ Modeled

- Additive, Single Base (**Impacted As-Planned**)
- Additive, Multiple Base (**Time Impact Analysis**)
- Subtractive, Single Base (**Collapsed As-Built**)
- Subtractive, Multiple Base (**Windows**)

# Forensic Scheduling – 1<sup>st</sup> Step



➤ 11 issues to be considered when selecting method

## ✓ Technical factors

- Purpose of analysis
- Source data & availability
- Complexity of dispute

## ✓ Legal factors

- Contract requirements
- Forum for resolution & audience
- Legal / procedural requirements

# Forensic Scheduling – 1<sup>st</sup> Step



## ➤ Practical factors

- ✓ Size of dispute
- ✓ Budget for analysis
- ✓ Time allowed for analysis
- ✓ Expertise of forensic scheduler & available resources
- ✓ Custom & usage of methods on project
- Choose carefully, may not be able to change later!
- Get “buy in” from legal counsel & client
  - ✓ Avoid surprises later on

# Forensic Scheduling – 2<sup>nd</sup> Step



- Gather all project records, particularly
  - ✓ Schedules & updates
  - ✓ Correspondence & e-mail
  - ✓ Meeting minutes
  - ✓ CO's, RFI's
- Review documentation for reliability
- Interview project participants
- Work closely with project scheduler
  - ✓ Determine actual update process & reliability of updates

# Forensic Scheduling – 3<sup>rd</sup> Step



- Implement required protocols for selected method carefully
  - ✓ If deviate on some, document how & why
- Use “blindsight” not hindsight
  - ✓ Do not ignore events / activities because know later on they do not impact final analysis
- Analyze critical path & near critical path for each run
- Arrive at logical, supportable conclusion which accounts for all delay (including concurrent) based on objective analysis & documented facts

# Non-Technical Skills for Schedulers



## ➤ Education

- ✓ Educate project team in art of planning & scheduling
- ✓ Mentor younger staff who show aptitude & interest

## ➤ Ability to communicate

- ✓ Be sensitive & intelligent in delivering messages

## ➤ Integration skills

- ✓ Bridge between planning, risk management, estimating, cost control
- ✓ Work with multiple sources of information
- ✓ Be the “spider in the web”

# Non-Technical Skills for Schedulers



## ➤ Responsiveness & timeliness

- ✓ Report promptly & accurately
- ✓ Remember – Bad news delivered early is useful information; bad news delivered late is disaster!

## ➤ Ability to build relationships

- ✓ Not just internally with project team
- ✓ Also with suppliers, subcontractors, JV partners & clients



# Non-Technical Skills for Schedulers



## ➤ Personal integrity

- ✓ Maintain “spine of steel” when telling team & client project running late & needs correction
- ✓ Be prepared to escalate issue if needed

## ➤ Maintain professional ethical practices at all times

- ✓ Do not play schedule games
- ✓ Do not schedule away delay
- ✓ Do not let team declare more progress than actual
- ✓ Do not modify schedule without good cause & documentation

# Conclusion



➤ Scheduling has little to do with hardware & software

✓ Set of skills & knowledge applied to a project

➤ Scheduler

✓ Key member of project team but not in charge

✓ Eyes & ears of project manager with respect to time (& sometimes cost) issues

✓ Plays key role in recording & documenting project history

✓ Alerts project team to developing problems early

• **While still time to do something about it**

✓ & plays key role in project time & cost recovery

# Challenge to Schedulers



- **Convince employers that all new hires should spend couple of years in scheduling & estimating before becoming project managers**
  - ✓ **They will be better project managers & senior executives if they do!**
- **When you find younger staff with a real interest & aptitude for scheduling, mentor them**
  - ✓ **Show them there is a real career path in project controls field**

# Questions?



**Jim Zack**

**jim.zack@navigant.com**

**Boulder, CO – 303-728-2545**

**Irvine, CA – 949-660-8232**

**[www.navigant.com/NCF](http://www.navigant.com/NCF)**