Lessons Learned – Schedule Updating and Maintenance using Primavera P6

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- Degree:
  - BA Journalism
- University:
  - Baylor University, Waco, TX
- Years of Experience:
  - 17
- Professional Field:
  - Construction, primary focus on scheduling and project controls, implementation of scheduling systems and document control systems
- Something you do not know about me:
  - Started my construction career working as a scheduling assistant during college using Primavera DOS version
  - Currently Vice President of Primavera Services for Hill International

Hannah Schumacher, PSP, PMI-SP, LEED AP

- Degree:
  - BS Construction Management
  - BS Building Construction Technology
- University:
  - Wentworth Institute of Technology, Boston, MA
- Years of Experience:
  - 20+
- Professional Field:
  - Construction, primary focus on scheduling and project controls
- Something you do not know about me:
  - Started my construction career working as a General Laborer during college
  - Worked as an Estimator, Planner / Scheduler, Project Controls Engineer, Project Engineer, Scheduling Engineer, Scheduling Director
  - Currently Managing Consultant for Hill International

- Many specifications are requiring the use of the latest Primavera software (P6).

- Our presentation focuses on the use of Primavera P6 to update and maintain schedules.

- The Schedule Update Process consists of 4 main steps:
  1. PLAN
  2. UPDATE
  3. REVIEW / ANALYZE
  4. COMMUNICATE

- PLAN

- Understand Contract and Specification Requirements
- Determine Update Frequency
- Establish Baseline / Contract Schedule
- Assign Responsibility to each activity
- Provide Training
- Gather Data
- Visit Job site, hold update meeting, and validate data
- Understand P6 settings that affect updates

**Lessons Learned –
Schedule Updating & Maintenance using Primavera P6**

- Understand Contract and Specification Requirements
    - Frequency of updates
    - Procedures for updates versus revisions
    - Earned Value requirements
    - Cost and/or resource status requirements
    - Change management procedures
    - Software requirements

■ Determine Update Frequency

- Factors to consider:
  - *Contract Requirements*
  - *Internal company policy*
  - *Project budgeting Considerations*
- Benefits to frequent updates:
  - *Greater accuracy of as-built documentation*
  - *Promotes early identification of issues*
  - *Promotes timely issue resolution / mitigation*
  - *Enhances user's skill in application & management of schedule*
  - *Provides starting point to which user can return if errors are made in updating process*

- Establish Baseline / Contract Schedule

  - Baseline is the accepted as-planned schedule (Contract Schedule)

  - In Primavera "Baseline" is a snapshot of project plan (similar to "Target" in P3)

    - *Number of baselines (maximum number is set by Administrator)*

    - *User can assign up to 3 baselines to current schedule for data comparisons*

    - *Can copy baselines when copying project*
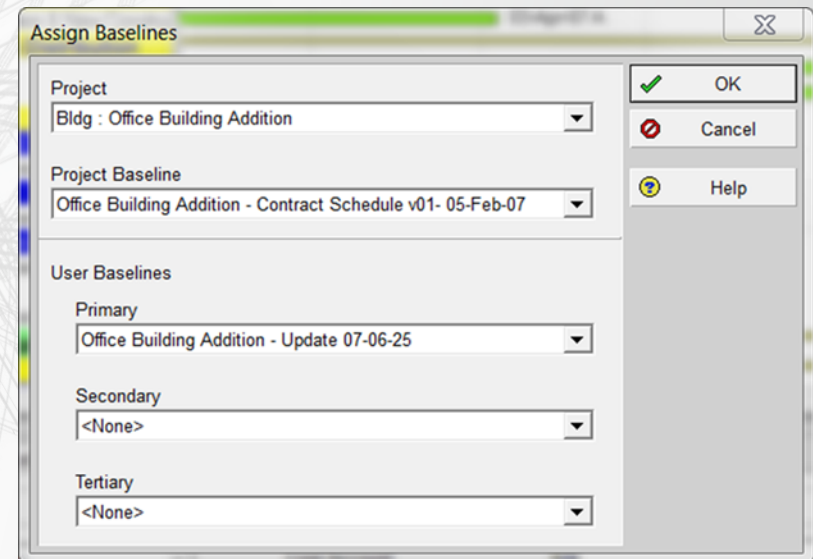
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- Assign Responsibility to each activity

  - Use Activity Code
    - *Global vs. Project Specific*
    - *Group and Sort by Activity Code*

Select Activity Code

GL-RESP

Display: All Values

Code Value	Description
CC	CONCRETE
CK	CAULKING
CT	CERAMIC TILE
CY	CITY / COUNTY
DM	DEMO
DW	DRYWALL / TAPE & TEXTURE
EF	EXTERIOR FRAMING / FINISHES
FP	FIREPROOFING
FR	FRAMING
GL	GLAZING
LV	LOW-VOLTAGE/CONTROLS

Group and Sort

Display Options

☐ Show Group Totals
  ☐ Show Grand Totals
  ☐ Show Summaries Only
☑ Shrink vertical grouping bands

Group By

Group By	Indent	To Level	Group Interval	Font & Color	
GL-RESP level 1	☑	All		12 Arial	
GL-RESP level 2				9 Arial	
GL-RESP level 3				8 Arial	
GL-RESP level 4				8 Arial	
GL-RESP level 5				8 Arial	
GL-RESP level 6				8 Arial	

- Assign Responsibility to each activity

  - Assign Resource / Role

    - *CAUTION: Resources and Roles are Global (use unique identifier)*

    - *Group by resources in Assignments window*

- Provide training

  - How to update the schedule

  - How to review the schedule

  - How to add fragnets for change management

  - Content of update reports

  - What information is needed from each individual

- Gather Data – Use Update Layout or Report
- Visit the jobsite, hold an update meeting, and validate data
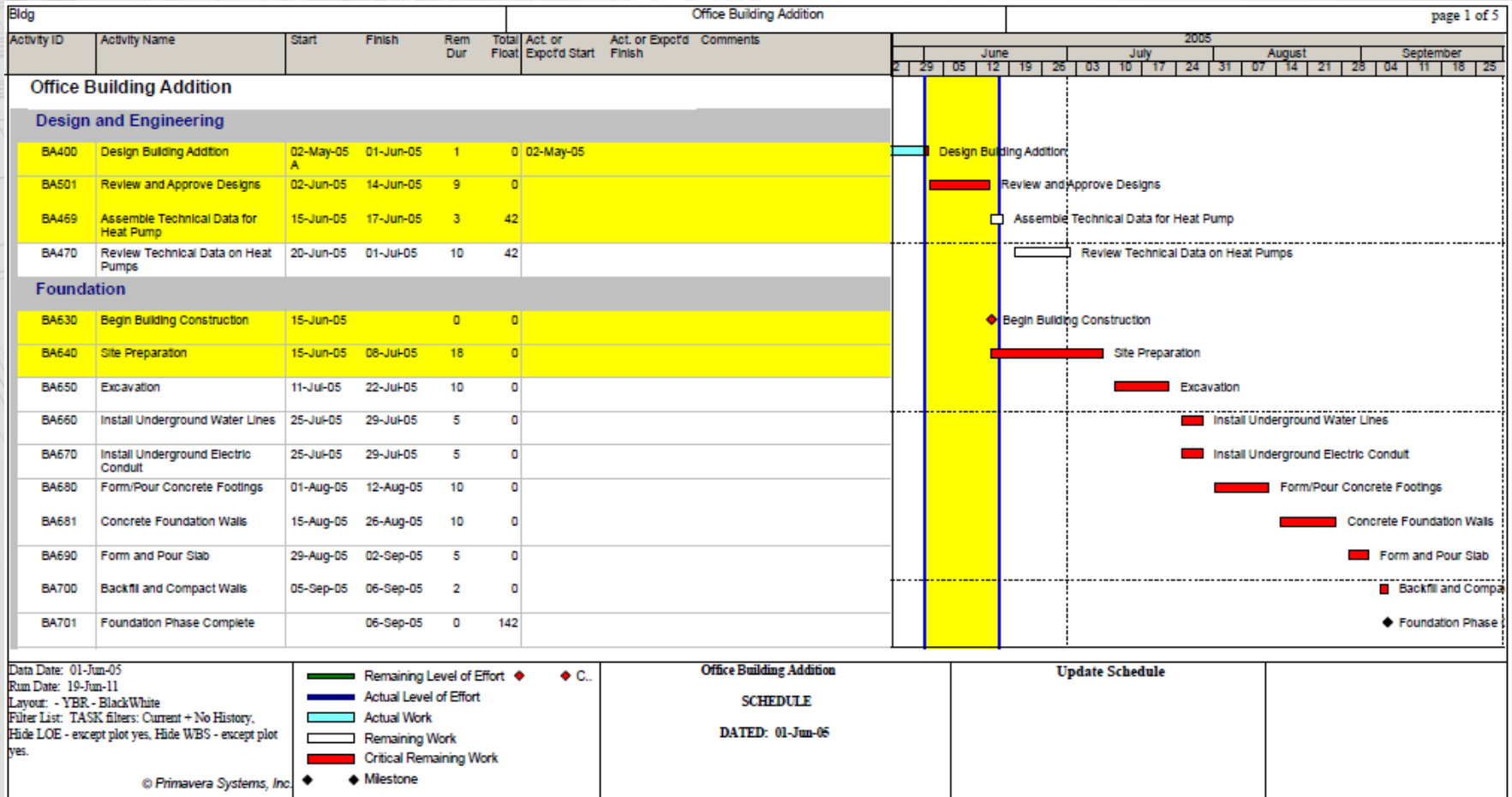
- Understand P6 settings that affect updates
- Security access settings
  - *Based on Organizational Breakdown Structure (OBS) Read / Write access can be defined down to the Work Breakdown Structure (WBS).*
  - *Set by the Administrator (Admin, Security Profiles)*
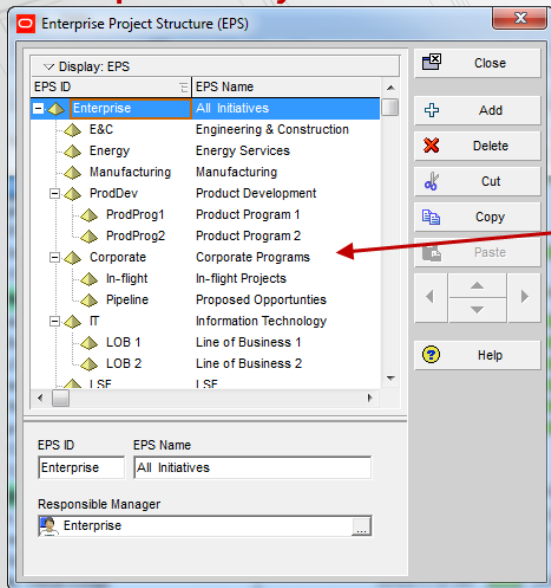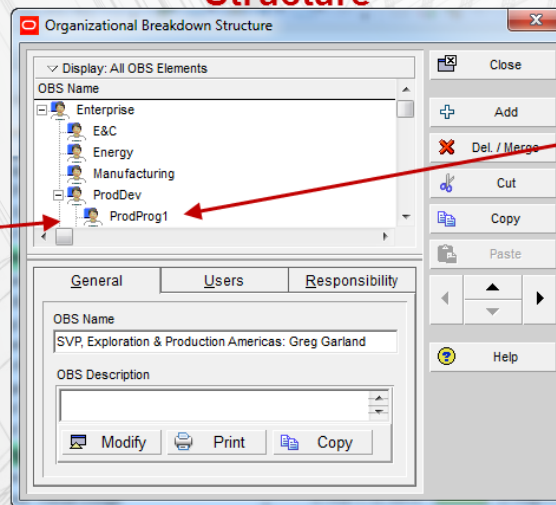
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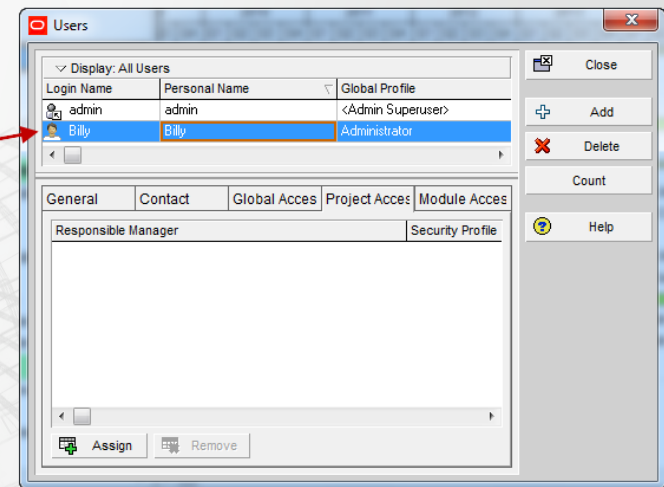
- Understand P6 settings that affect updates
- Percent Complete Types
    - *Duration Percent Complete (default)*
    - *Physical Percent Complete*
    - *Units Percent Complete*

Activity Percent Complete 1.4.A.4.

4. Remaining durations for activities.

a. The remaining duration shall be the actual time in workdays to complete the activity.

b. Remaining duration shall not be automatically computed based on the percent complete of the activity.

- *Default type defined at the Project Level (Projects Details, Defaults tab) and can be changed at the Activity Level (Activity Details, General Tab)*
- *Project Level defaults only apply to new activities.*

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- Understand P6 settings that affect updates
- Duration Types
  - *Fixed Duration and Units (default)*
  - *Fixed Duration and Units/Time*
  - *Fixed Units*
  - *Fixed Units/Time*
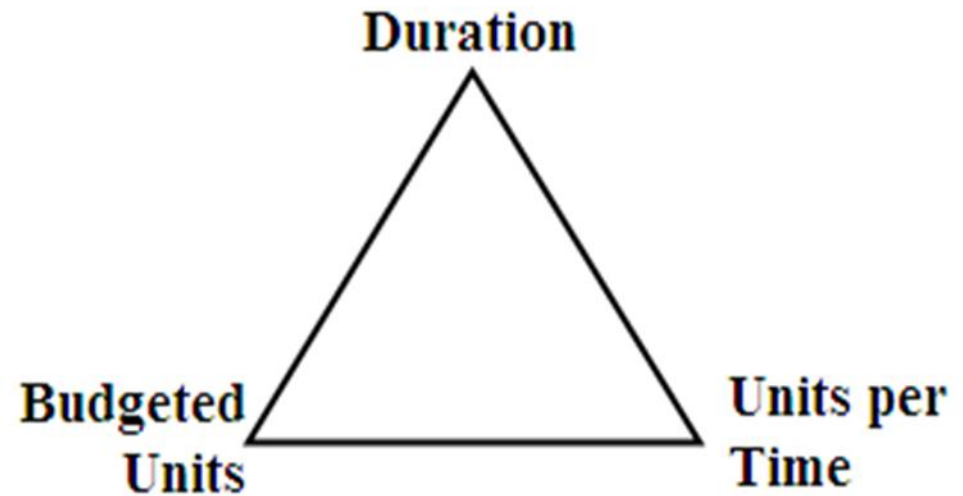
- Understand P6 settings that affect updates
- Activity types
  - *Milestones*
  - *Task Dependent and Resource Dependent*
  - *Level of Effort and WBS Summary*
  - *Default Activity type is set at Project Level (Project Details, Defaults tab)*

  - *Change type at Activity Level (Activity Details, General tab)*

| General | Dates | Defaults | Notebook | Budget Log | Spending Plan | Budget Su |

Defaults for New Activities

Duration Type	Fixed Duration & Units
Percent Complete Type	Duration
Activity Type	Task Dependent

Finish Milestone
Level of Effort
Resource Dependent
Start Milestone
Task Dependent
WBS Summary

| General | Status | Resources | Relationships | Predecessors | Successors | Codes |

Activity MI-0020   SUBSTANTIAL COMPLETION

| Activity Type | Duration Type |
| Finish Milestone | Fixed Duration and Units/Time |

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- Understand P6 settings that affect updates
- Calculation settings (General)
  - Relationships to and from other
  - Projects
  - Open ends
  - Schedule Calculation options
    - *Retained Logic*
    - *Progress Override*
    - *Actual Dates*
  - Critical activity definition
  - Calculate SS lag
  - Float definition
  - Calendar for scheduling relationship lag

Schedule Options

General | Advanced

☐ Ignore relationships to and from other projects
☐ Make open-ended activities critical
☑ Use Expected Finish Dates
☐ Schedule automatically when a change affects dates
☐ Level resources during scheduling
☐ Recalculate assignment costs after scheduling

When scheduling progressed activities use
◉ Retained Logic   ○ Progress Override   ○ Actual Dates

Calculate start-to-start lag from
◉ Early Start   ○ Actual Start

Define critical activities as
◉ Total Float less than or equal to
  0h
○ Longest Path

Calculate float based on finish date of
◉ Each project   ○ Opened projects

Compute Total Float as
Finish Float = Late Finish - Early Finish ▼

Calendar for scheduling Relationship Lag
Predecessor Activity Calendar ▼

- Understand P6 settings that affect updates
- Resource settings
  - *Resource Details for Labor, Nonlabor, Material*
    - Auto Compute Actuals
    - Calculate costs from units
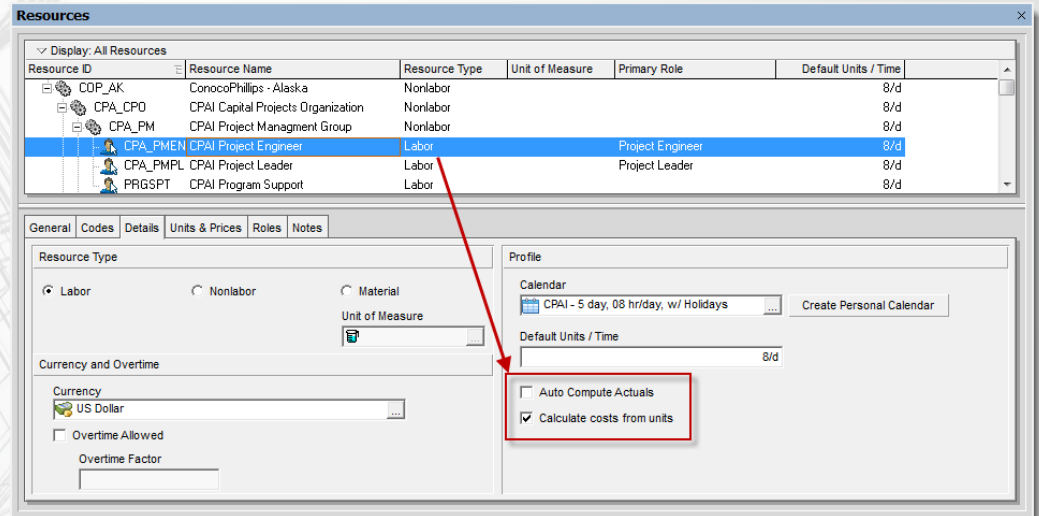
  - *Activity Details*
    - Override Resource Details settings

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- Understand P6 settings that affect updates
- Resource settings at Project Level (Project Details, Calculations tab)

  - *Link Actual and Actual This Period Units and Costs (when using Financial Periods)*

  - *Resources Drive activity dates by default (Project Details, Resources tab)*

Lessons Learned –
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- Understand P6 settings that affect updates
- Financial Periods
  - *Defined at Admin Level (Admin menu, Financial Periods)*
  - *CAUTION: Financial Periods are GLOBAL*
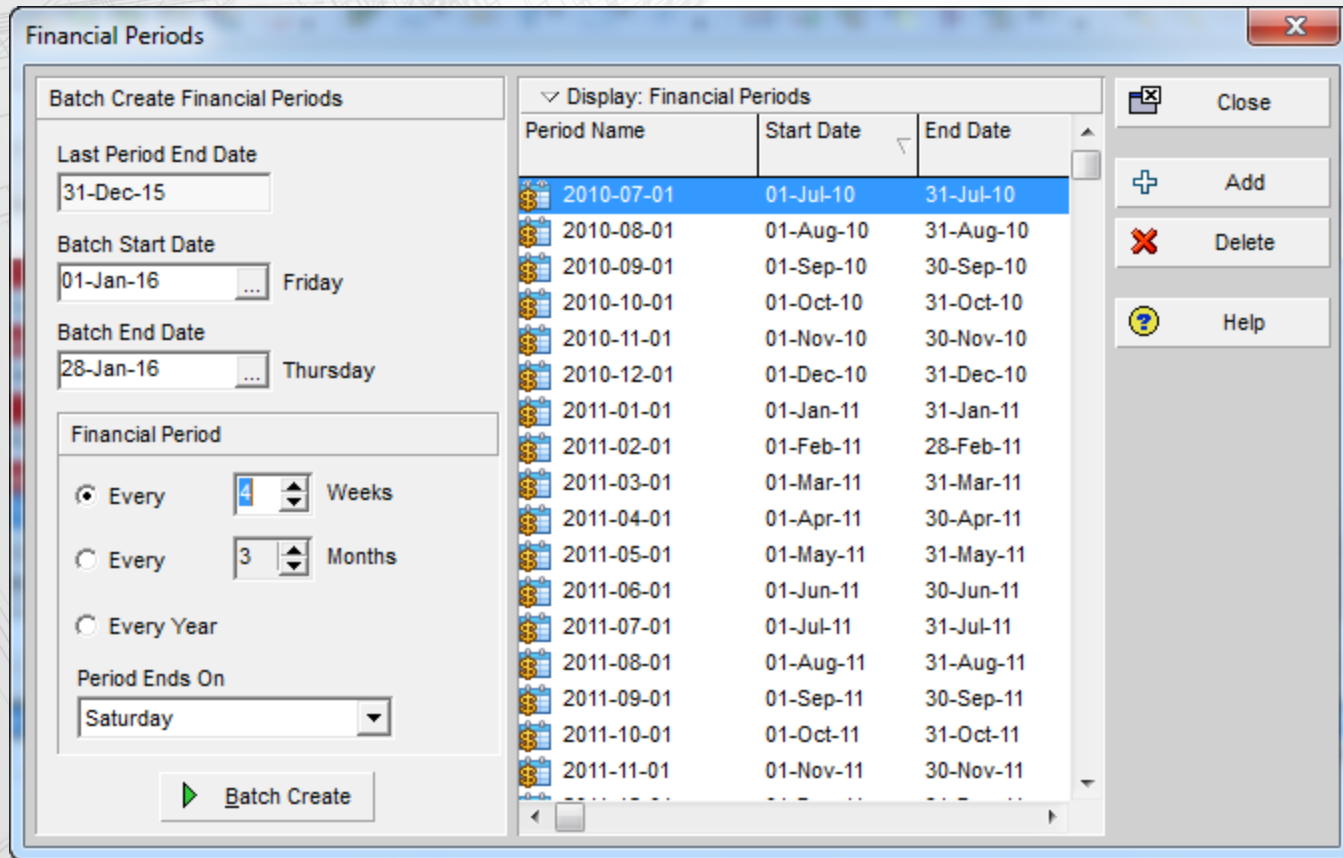
- UPDATE

- Opening the file – (Exclusive / Shared / Read Only)
- Importing and Configuring 'Outside' Information
- Maintain Baseline
- Rename File
- Assign and Compare Baselines
- Enter Status (dates, percent complete, resources, costs)
- Enter Revisions / Forecast (activities, durations, logic)

- Opening the file
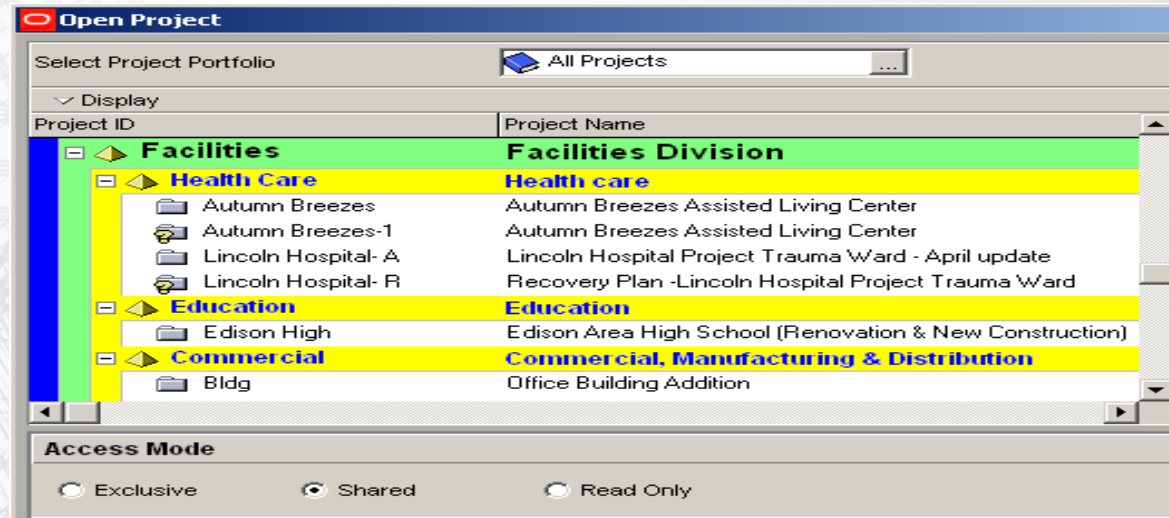
- Exclusive
  - *only one user can change / modify the schedule*
  - *Recommended to use when updating / statusing*

- Shared
  - *multiple users can change / modify the schedule AT THE SAME TIME*
  - *CAUTION: this is the default when selecting project from Project Window, right-click, select Open*

- Read Only
  - *view only mode*
  - *can not change / modify the schedule*

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Lessons Learned –
Schedule Updating & Maintenance using Primavera P6

- Importing and Configuring 'Outside' Information
- Import Configuration utility – how to handle duplicate data.
    - Do Not Import
    - Insert New
    - Keep Existing
    - Update Existing
    - Delete

A* = Same ID but modified data

Do Not Import		Insert New		Keep Existing		Update Existing	
Existing	New	Existing	New	Existing	New	Existing	New
A	A*, B	A	A*, B	A	A*, B	A	A*, B
A *(after import)*		A, A*, B *(after import)*		A, B *(after import)*		A*, B *(after import)*	

- Maintain Baseline (Activity window, Project, Maintain Baseline)
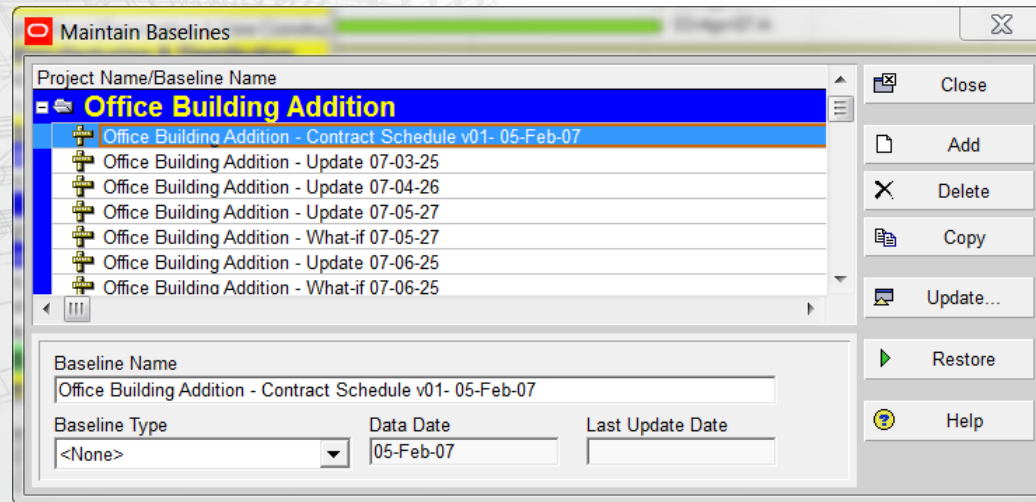
- Rename File to new version (i.e. EX00 → EX01) (Project Window)

- P6 allows user to copy current schedule as a 'Reflection', make changes and merge back into current schedule

- CAUTION: The following data items when deleted in a Reflection copy WILL NOT be deleted in current schedule during the merge: Activities, Relationships, Resource Assignments, WBS elements, Work Products and Documents, Project Expenses, Project Issues and Project Risks. These would need to be manually deleted. (Oracle Knowledgebase ID 908732.1)

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- Assign and Compare Baselines

  - Project: Standard baseline for comparison for all users (typically the Contract Baseline Schedule)

  - User Baseline (Primary, Secondary, Tertiary)

    - *Primary Baseline allows for dates, resource, etc. comparisons*

    - *Secondary and Tertiary compare date information only*
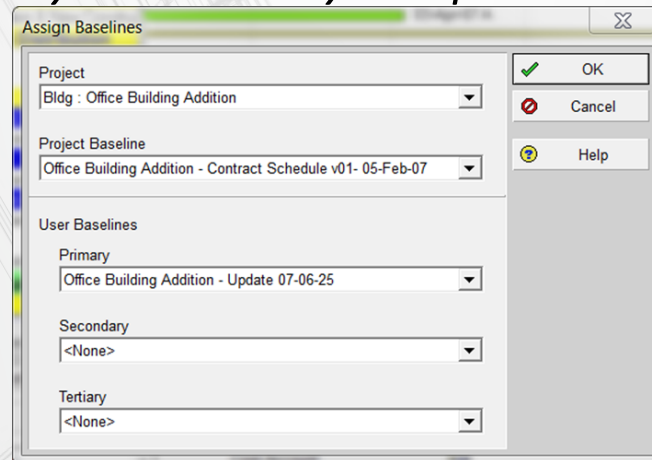
- Check earned value settings (Admin, Earned Value, Earned Value Calculation)

  - These settings determine which baseline dates will be used for comparison.

- Prior to statusing, make sure time is shown to alleviate non-standard start/finish times (Edit, User Preferences)

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Lessons Learned –
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- Enter Status
    - Actual Start dates
    - Actual Finish dates
    - Percent complete
    - Remaining duration
    - Resources and/or Costs
- Enter Manually
- Apply Actuals (Tools menu, Apply Actuals)
- Update Progress (Tools menu, Update Progress)
    - *CAUTION: Apply Actuals and Update Progress use PLANNED Dates versus Scheduled Dates or Early Dates which may be different*
- Calculate the schedule (Tools, Schedule) with new Data Date
    - *Recommendation: To improve speed and efficiency of the program, turn off option to "Schedule automatically when a change affects dates"*
- Review data entered
- Maintain Baseline (with 'Status only' in title)

Lessons Learned –
Schedule Updating & Maintenance using Primavera P6

- Enter Revisions / Forecast
  - New Activities
  - Delete Activities (Do not reuse Activity IDs)
  - Revise Logic
  - Revise Durations
- Calculate the schedule (Tools, Schedule) with new Data Date
  - *CAUTION – To improve speed and efficiency of the program, turn off option to "Schedule automatically when a change affects dates"*
- Review data entered
- Maintain Baseline (with 'Revision' added to title)
- Review compared to 'status only' update as well as previous update and Baseline schedule

- REVIEW & ANALYZE

- Review and Verify data input (Scheduler self-check)
- Compare to previous update and Contract schedule
- Review Logic reports / Layouts and Changes made
- Finalize and Maintain Baseline (of this finalized update)

- Review and Verify data input (Scheduler self-check)
  - Open Ends (activities with no Predecessors and / or Successors)
  - Dangling Relationship ties (Start to Start and/or Finish to Finish ties without a Predecessor and/or Successor)
  - Incorrect and non-overlapping lag ties that result in gaps in sequencing
    - Start to Start lag that exceeds the activity duration
    - Finish to Finish lag that exceeds the successor duration
    - Finish to Start lag
  - Out of Sequence progress
  - Actual dates in the future
  - Incorrect times
  - Calendars
  - Activities on the data date (verify predecessor logic)
  - Excessive float values
  - Negative float
  - New activities, durations, logic and impact to plan
  - Critical Path and Near Critical Path
  - Constructability issues
  - Stacking of trades

- Compare to previous update and Contract schedule
- Create comparison layouts
    - Assign appropriate baseline (Project menu, Assign Baseline)
    - Select baseline bars (View, Bars) and baseline data columns
        - *Note: varying baseline types (Project vs. User Baselines – Primary, Secondary, Tertiary) allow for different levels of data for comparison.*
    - Check earned value settings (Admin Preferences, Earned Value)
        - *Determines what dates will be used for comparison – Planned or Start/Finish*
        - *Recommendation: use "Budgeted values with current dates"*
        - *CAUTION: Setting is global, not project specific, affects all projects in the database*

- ## Comparison layout:

- Review Logic reports / Layouts and Changes made

- Schedule Log

- Claim Digger

- Tabular Reports

- Schedule Analyzer for the Enterprise (SAe)

- Once the entire team has reviewed and approved the draft update, finalize and Maintain Baseline

    - Maintain Baseline (Project, Maintain Baseline, Save Copy)

    - Export

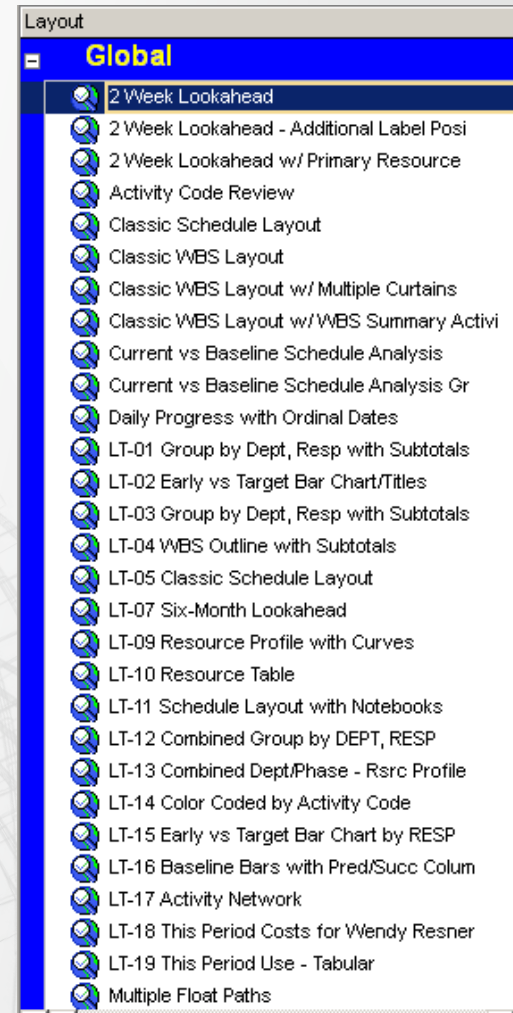   - Backup to safe location(s)
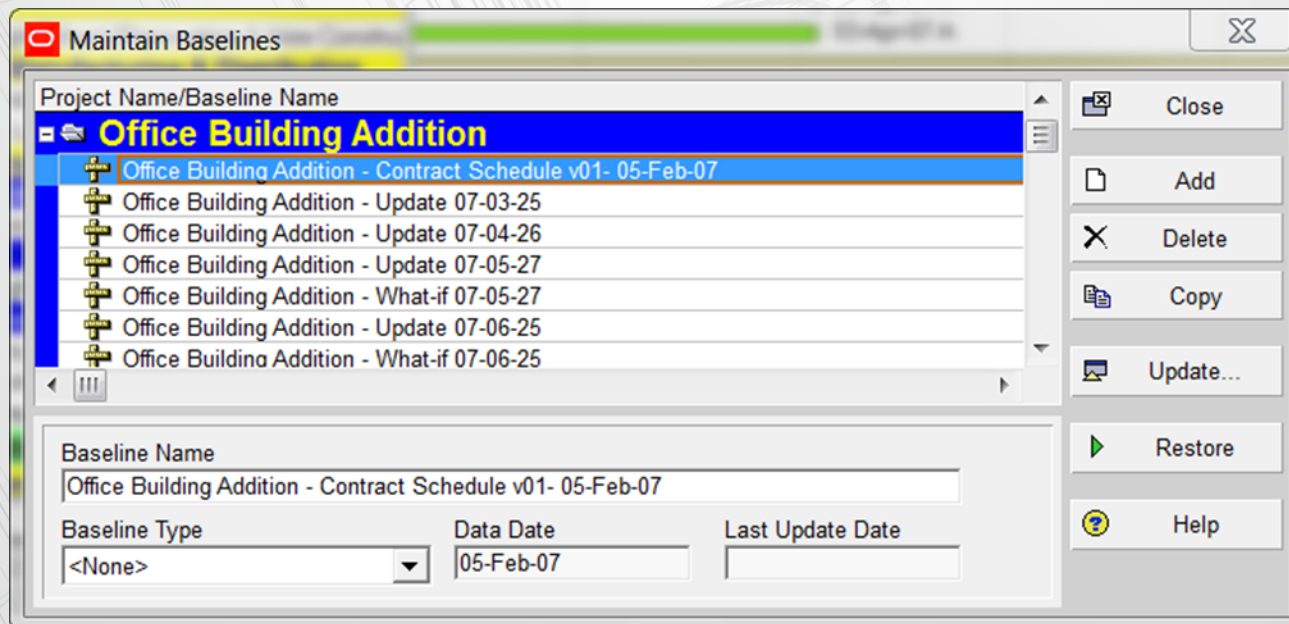
- COMMUNICATE

- Layouts
- Reports

- Layouts
  - Global (available to all projects in the database)
  - User (available to only the user)
  - Project (specific only to the project)
- Bar charts
- Look ahead schedules
- Critical Path
- Near Critical Path
- Responsibility sorts

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- Time Scale Logic (available in P6 v7 Service Pack 3)
(Tools, Time Scale Logic Diagram)
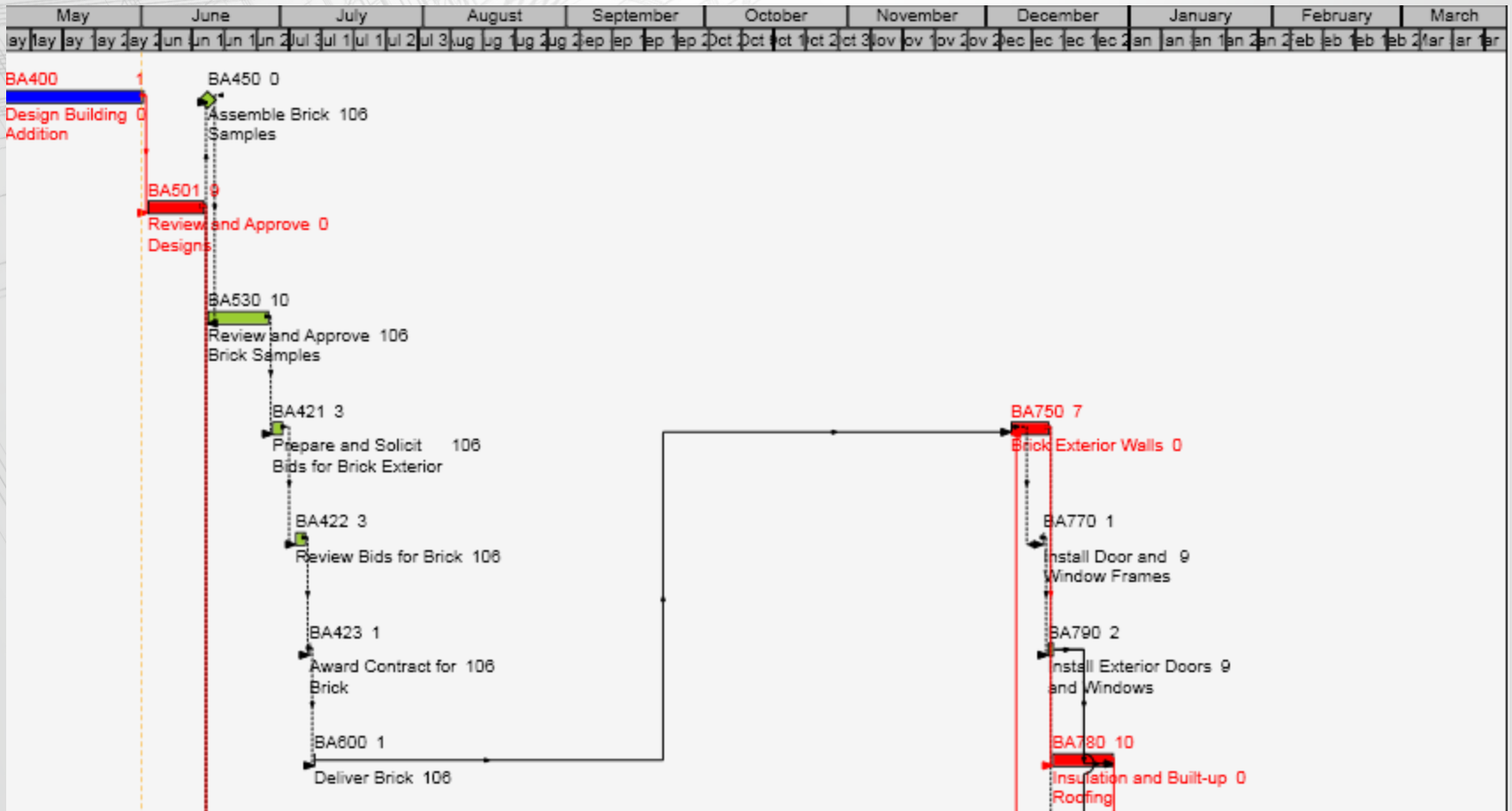
- Standard Reports

  - Schedule

  - Resource

  - Cost

- Customized Reports using Report Editor or Report Wizard

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- CONCLUSION

  - Understand contract and specification requirements

  - Understand the P6 settings that affect updates

  - Provide training to those responsible for providing and reviewing the update data

  - Visit the jobsite and walk the job

  - Hold an update meeting and verify data

  - Update Frequently

  - Review and Analyze the schedule

  - Maintain Baselines for comparison

  - Compare to previous updates and Baseline Schedule

  - Communicate the schedule using Reports and Layouts

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- We hope that you can use schedule updating and maintenance lessons learned outlined in this presentation to update your schedules quickly and efficiently using Primavera P6™

Questions?

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