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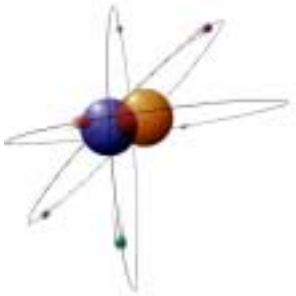

**Spherical Angle, Inc.**

The Looking Glass Suite™

# cc-Pulse™ and Earned Value Management System
# Rev. 1 8/4/03

# 1 Earned Value Management System (EVMS)

If you find yourself here, you probably know what is EVMS. If you don't, the reference we recommend is *Earned Value Project Management*, by Quentin W. Fleming and Joel M. Koppelman, September 2000. ISBN: 1880410273.

## 1.1 Earned Value and Critical Chain

Critical Chain Project Management advocates using average duration estimates[1] for modeling the tasks in the project. A safe estimate of duration is also used, to approximate the amount of variation in task duration, and to size the buffers.

If you use the average durations for the Earned Value (EV) baseline, the Earned Value metrics will often look unfavorable. This is because you are likely to routinely over-run the average duration estimates, creating an unfavorable variance.

Most practitioners that use Critical Chain in an environment that requires earned value reporting, deal with this problem by stretching the unbuffered baseline project so that the last day of baseline work in the plan coincides with the original end of the project buffer.

Below is a step-by-step procedure for managing using Critical Chain(CC) in an environment that requires Earned Value reporting.

## 1.2 Steps to create a CC EV Baseline:

### 1.2.1 Plan the project.

Do all of the project modeling steps required for a Critical Chain project, including modeling resource costs, and inserting all of the needed buffers.

### 1.2.2 Record the Buffered Finish.

The Buffered Finish can be obtained from the Control Center screen. Be sure to record the value. (_____)

### 1.2.3 Save your Duration columns

- Insert the "Duration2" and "Duration3" columns into your spreadsheet after the Average Duration
- Copy the Average Duration into the Duration2 column, and safe duration into the Duration3 column for safekeeping.

### 1.2.4 Reset the network.

Do so using the reset network button. Be sure to leave everything checked in this dialog box. This will remove all of the buffers, so that you can work with the unbuffered project duration.

### 1.2.5 Stretch the unbuffered project:

- Make the Current Finish coincide with the Buffered Finish, noted in the earlier step. To do so use the "Factor Durations" feature in the Project Control Center. Start by selecting "Increase Task Durations" and use a value of 33%.
- Level the resources, then compare the expected finish of the latest task to the buffered finish noted earlier.

[1] Some Critical Chain advocates teach the use of an "aggressive but achievable" duration estimates for modeling. The choice of average vs. "aggressive but achievable" duration estimates for modeling the Critical Chain project will not have much effect on the results of this procedure.

- Repeat until you find the factor that makes the expected finish of the latest task coincide with the buffered finish noted earlier.

#### 1.2.6 Save Baseline[2]

Use Tools…Tracking…Save Baseline. Select the top choice, which is an un-numbered baseline. If you have MS Project 2002 or newer, please see the footnote.

#### 1.2.7 Recover your Critical Chain durations.

Copy the Duration2 column back into the Average Duration column, and Duration3 back into the Safe Duration column.

#### 1.2.8 Re-Run the Critical Chain planning steps.

Do the Critical Chain planning steps, to re-establish the buffers.

#### 1.2.9 Go To Tracking.

Select the "Tracking Mode" toolbar button. In the ensuing dialog box, be sure to uncheck the "Create New Baseline" option, or you will over-write the EV baseline.

### 1.3 Result

Now, as you track the project, record remaining duration estimates regularly. If desired, you may also record actual starts and actual finishes for the tasks. Note that if you do not record actual starts and actual finishes, cc-Pulse will make assumptions about the actual starts and the finishes of the tasks for you, based on the status date. The field ACWP, BCWP, and BCWS will be calculated for you, by MS Project. From these fields, it is possible to calculate the CPI, SPI, and other EV metrics as needed.

## 2 Earned Value and Critical Path – An Alternate Procedure

While we recommend the procedure described in Section 1 for planning a project that will be measured under Earned Value, it may be necessary to baseline the project in Critical Path (CP) mode, then manage the project under Critical Chain. Situations where the Critical Path baseline may be required include:

- A customer requires a Critical Path plan,
- Results from Critical Chain are needed, before Critical Chain will be accepted as the baseline plan.

### 2.1 Steps to Create a CP EV baseline

#### 2.1.1 Plan the project.

Do all of the project modeling steps required for a Critical Path project, including modeling resource costs, and using safe estimates of duration. Place the safe estimates of duration in the Duration field in MS Project. It is renamed "Average Duration" in the cc-Pulse™ views.

#### 2.1.2 Record the Expected Finish.

The Expected Finish is the last day of scheduled work in the project. You may want to record the value. (_____). This is not strictly necessary, as you will be able to see it as the Baseline Finish for the latest task in the project plan.

[2] If you have MS Project 2002 or newer, you can choose to store your Earned Value baseline is one of the numbered baselines, and cause the fields ACWP, BCWP, and BCWS to be calculated based on the numbered baseline, via Tools…Options….Calculation tab, and select the Earned Value button.

### 2.1.3 Save Baseline[2]

Use Tools…Tracking…Save Baseline. Select the top choice, which is an un-numbered baseline. If you have MS Project 2002 or newer, please see the footnote.

### 2.1.4 Obtain Average Durations

Your Duration column now contains safe estimates of duration. Copy the Duration column into the "Safe Duration" column (Duration2 in MS Project), and obtain average duration estimates for the Duration column. One way to do so is to use the "Factor Durations" feature in the Project Control Center. You may select "Decrease Task Durations" and use a value of 50%. Note also that the Safe Durations will be decreased along with the Average durations, so you may want to store your Safe Durations temporarily in the Duration3 column, until the Factor Durations operation is complete.

### 2.1.5 Run the Critical Chain Planning Steps

Do all of the Critical Chain planning steps, including buffering. Ensure that the project is positioned such that the start of the project is the same as the baseline start. The project can be positioned through the "Position Network From" feature in the Control Center.

### 2.1.6 Check the Buffered Finish

Verify that the end of the project buffer is earlier than or equal to the baselined end. If not, the Critical Path plan is infeasible, and should be revised. Use either safer estimates of duration, or level the resources before saving the Critical Path baseline.

### 2.1.7 Go to Tracking

Select the "Tracking Mode" toolbar button. In the ensuing dialog box, be sure to uncheck the "Create New Baseline" option, or you will over-write the EV baseline.

## 2.2 Result:

Now, as you track the project, record remaining duration estimates regularly. If desired, you may also record actual starts and actual finishes for the tasks. Note that if you do not record actual starts and actual finishes, cc-Pulse will make assumptions about the actual starts and the finishes of the tasks for you, based on the status date. The field ACWP, BCWP, and BCWS will be calculated for you, by MS Project. From these fields, it is possible to calculate the CPI, SPI, and other EV metrics as needed.