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Earned-Value Benchmarks for Re-baselining Your Project

Handy benchmarks to help you re-baseline a project

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Introduction

When you re-plan a project, you must integrate many concerns: the lessons learned from the project to date, changes in scope, evolving stakeholder needs and expectations, schedule demands, staffing conflicts, and even changes in the underlying technology.

While wrestling to integrate all these factors into a new plan with a new baseline, it's handy to have some benchmarks from the original plan's earned-value analysis. These benchmarks can give you some minimum estimates for overall cost, for the effect of scope changes on cost, and for the shape and size of the new plan's staffing profile.

The decision to re-baseline a project rests on the recognition that the current project has changed enough that the re-planning the project is worth the effort. A re-baseline occurs only with the consent of all parties involved in the project, and only with the full knowledge and approval of the customer. Often a re-baseline involves significant scope changes. The major results of the re-baseline are a revised plan with revised cost, schedule, scope, and staffing for the project.

When re-planning, you must consider the past earned-value calculations on the project to be sure that the new plan is consistent with these calculations and their underlying assumptions. The completed re-baseline establishes the new planned value that the future earned-value analysis will use.

The discussion and exercises in this white paper will show you how to use five earned-value benchmarks to help you create a re-baselined plan that works.

Note: this white paper is intended as a sequel to an earlier white paper, *Earned Value: Ideas and Exercises*. If you have not read it, you may want to download it from New Leaf's site and become familiar with the basics of earned-value analysis before continuing. This discussion begins with the simple example that appears in the earlier paper.

A Simple Example

The project shown in Figure 1 below has an original cost, or Budget at Completion (BAC), of 1000 staff-days and an original schedule of 10 months. The calculations begin with the “s-curve” chart of information that depicts the project’s planned value from start to end, and the two actual lines from the project start to the current date. One of the two “actual” lines depicts the actual cumulative cost to date, the other the actual cumulative earned value to date. The last bits of information in the graph are the present date and the planned value to date.

Figure 1. A typical earned value chart

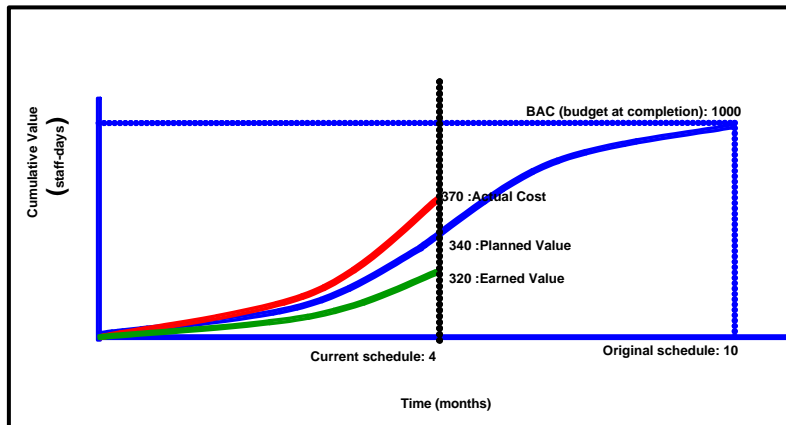


Figure 2. A typical project task list

Task List					
Task name	Plan	Actual	Earned Value	Date completed	
				Planned	Actual
...					
MONTH 3	240	268	238		31-Mar
Pink	16	14	16	2-Apr	5-Apr
Violet	12	16	12	5-Apr	10-Apr
Red	18	22	18	5-Apr	8-Apr
Vermillion	8	10	8	15-Apr	20-Apr
Blue	18	24	18	20-Apr	18-Apr
Brown	8			22-Apr	
Green	10	16	10	22-Apr	28-Apr
Yellow	10			25-Apr	
MONTH 4	340	370	320		30-Apr
Brown*	*			22-Apr	
Yellow*	*			25-Apr	
Beige	2			2-May	
Apricot	2			5-May	
Pink	3			5-May	
...					

In Figures 1 and 2, the total plan for the project involved 1000 staff-days of value (the Budget at Completion, or BAC) accumulated over 10 months with a staff of 5 full-time people. At the 4-month mark, with no open tasks, the total accumulated earned value is 320 staff-days. The plan at this point is for 340 staff-days to have been earned. Alas, the actual amount spent (because extra staff time has already been applied to this project) is 370 staff-days.

A summary of the facts:

1. Original project cost: 1000 staff-days
2. Original project schedule: 10 months
3. Planned value: 340 staff-days at 4 months
4. Actual cost: 370 staff-days
5. Earned value: 320 staff-days
6. Current monthly staff: 5 people

Earned-Value Figures

The following earned-value figures derive from the initial facts in our example:

$$\text{Cost Variance} = 320 - 370 = -50$$

$$\text{Cost Performance Index} = 320 / 370 = .86$$

Note: Because the CV is usually negative, we will call a negative CV a *cost shortfall* and define it to be the absolute value of the negative cost variance [New Leaf definition].

$$\text{Cost Shortfall} = |-50| = 50$$

$$\begin{aligned} \text{Cost Estimate at Completion, EAC (if atypical variance)} &= 1000 + |320 - 370| \\ &= 1050 \text{ staff days} \end{aligned}$$

$$\begin{aligned} \text{Cost Estimate at Completion, EAC (if typical variance)} &= 1000 / (320 / 370) \\ &= 1000 / 0.86 = 1156 \text{ staff-days} \end{aligned}$$

The First Benchmark for Re-baselining: Actual Cost

The first earned-value benchmark in a re-baselined project is that ***all three curves begin at the current actual cost***. Resetting the current planned value to the current actual cost simply acknowledges what your current project has already cost.

Whether this labor was spent wisely or foolishly, it must now be included as part of the cost of the project and part of the re-baselined plan. Once you have declared all the work to be part of the plan, you have defined it to be “planned value” and you may take credit for having accomplished this planned value by resetting the project’s current earned value to the current actual cost.

Here is a simple example:

Current values

Planned value: 340 staff-days at 4 months

Actual cost: 370 staff-days

Earned value: 320 staff-days

Re-baselined values

Planned value: 370 staff-days at 4 months

Actual cost: 370 staff-days

Earned value: 370 staff-days

The next benchmarks will tell the planner if the re-baselined project's cost is consistent with the lessons learned from the project to date.

Cost Variance

Earned value Cost Variance can be regarded in three ways. First, it may be so small as to be *irrelevant* to future planned activities. Second, it can be considered *atypical* and the cost EAC will be offset only by the current atypical variance. Third, the variance can be *typical*, symptomatic of a real difference between the plan and the actual work, and will proportionately affect the cost EAC.

If the planner decides that the cost variance is *irrelevant* and can be absorbed within the original plan and still meet the original cost, then a re-baseline is not necessary. However, a theoretical re-baseline would simply extend from the current actual cost to the original end-point.

If the planner decides that the present cost variance cannot be absorbed in the original plan, that the variance is *atypical*, and that the present plan for the remaining project is accurate, the re-baseline will extend from the current actual cost to an end-point that is adjusted for the current shortfall of cost.

If, as is most likely, the planner decides that the present cost variance is *typical*, and indicates conditions that will persist for the remainder of the project, the re-baseline will extend from the current actual cost to an end-point whose new cost (also called new Budget at Completion, or BAC) is at least as high as the old EAC.

Second Benchmark: the Earned-Value EAC

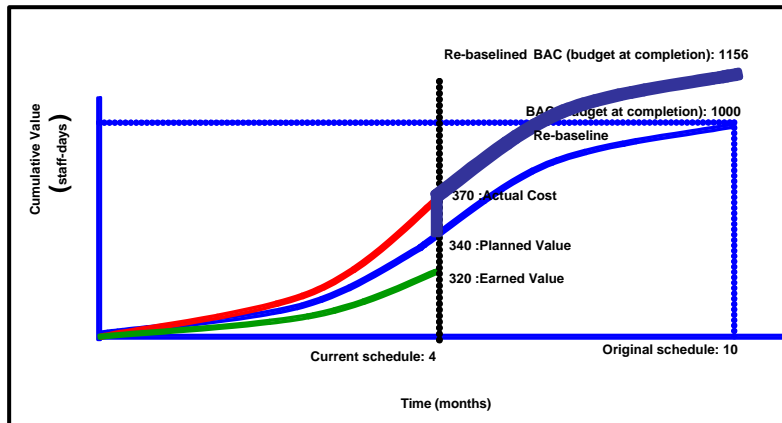
All three of the assumptions, *irrelevant*, *typical*, or *atypical*, lead to an earned-value benchmark for cost: the earned-value cost estimate at completion, or EAC. The most common (and the most conservative) case is to assume that the cost variance is *typical*. Here is our conservative example continued:

Re-baselined cost and schedule assuming typical variance

$$\begin{aligned} \text{Re-baselined BAC} = \text{EAC (if typical variance)} &= 1000 / (320 / 370) \\ &= 1000 / 0.86 \\ &= 1156 \text{ staff-days} \end{aligned}$$

Figure 3 shows our sample re-baseline increased to 1156 staff-days. Notice how the re-baseline begins with a step jump to the current actual cost and steadily works its way upward toward a final total of 1156 days.

Figure 3. Conservative example re-baseline



Third Benchmark: Scope Percentage

The re-baseline's end-point can be adjusted up or down depending on the re-baselined project's *scope percentage* of the original. Scope itself is measured in units that are related to, but not necessarily identical to, the project's *product*. Scope is often measured in detailed *features* of the product (such as square feet of building, treated patients, or lines of code), and the related *detailed deliverables* in the project plan (associated with lines of code in a computer program, are detailed deliverables such as: requirements documents, design documents, test data, and integration tests).

A good first approximation of scope is to compute the total re-baselined project's units as a *percentage* of the original units and to adjust the final cost and schedule figures for any scope changes not already included. If, on the one hand, all of the final scope increase was included in the reasoning that led to the assumption that the variances were *typical*, the cost estimates require no further adjustments. If, on the other hand, a 10% increase in features is going to appear in the re-baselined project and these features were *not* included in the *typical* assumption, then the cost figures should be increased by 10%.

Note: The re-baselined project's precise *scope percentage* depends on considering each variation to an original unit of scope and examining how much of that variation was included in the earlier assumptions about cost. Detailed scope planning may indicate that an adjustment to the schedule is also appropriate. Any schedule adjustment is *completely independent* of the cost adjustment.

Here is the conservative example adjusted for a 10% increase in scope:

Re-baseline adjusted for Scope Percentage

Scope Percentage = 110%

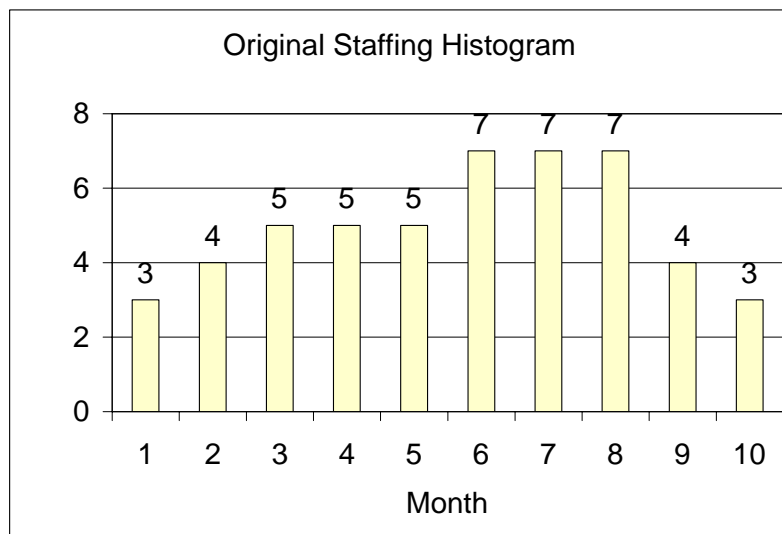
Re-baselined Budget at Complete, BAC = 1.10 x 1156 = 1272 staff-days

Fourth Benchmark: Re-baselined Schedule's Staffing Pattern

The re-baselined schedule does not, in general, affect the total cost (except for the case of any calendar-driven costs). It affects the *rate* of costs and, consequently, the staffing pattern expressed in the re-baselined staffing histogram.

Figure 4 illustrates the original project's staffing histogram. It shows the size of the staff measured in full-time equivalents (FTEs) for each month in the schedule. The project total is 50 FTEs. Using 20 staff-days per month of FTE, this histogram generated the 1000 staff-days in our conservative example. Notice how the plan's work grows more intense in the middle months and then tapers off at the end.

Figure 4. Original plan's staffing histogram



The next step in re-baselining the plan is to choose a re-baselined schedule. Our re-baselined schedule could be less than, the same as, or greater than, the original schedule. In our example, the original plan was 10 months and 1000 staff days; in the re-baseline so far, the plan is 1272 staff-days. We decide to *preserve the original schedule* and choose a re-baselined schedule of 10 months.

Because we stuck with the original schedule, our planned staffing histogram is already spread out over the chosen schedule. We don't need to rearrange the pattern of the initial staffing histogram.

Figure 5 shows what might happen if we had re-baselined to 9 months and Figure 6, if we had re-baselined to 12 months. In both cases the original total of 50 FTEs (or 1000 staff-days) is preserved, but each histogram adopts a different pattern of activity to achieve the originally planned work.

Figure 5. Original plan's staffing histogram adjusted for a re-baselined schedule of 9 months

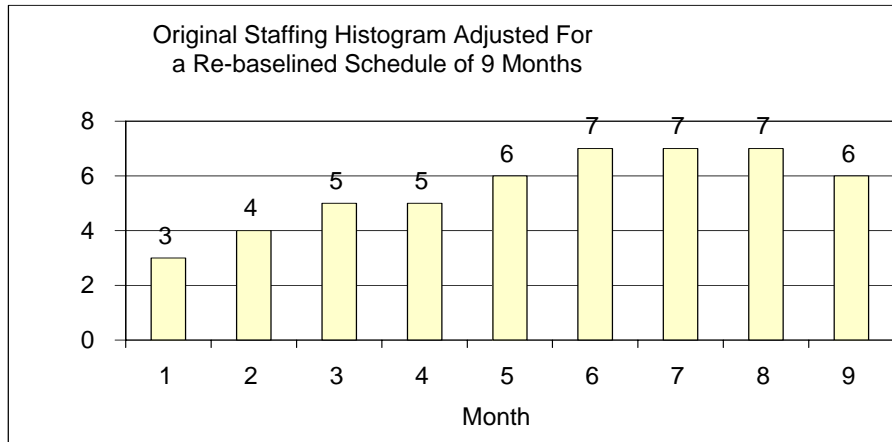
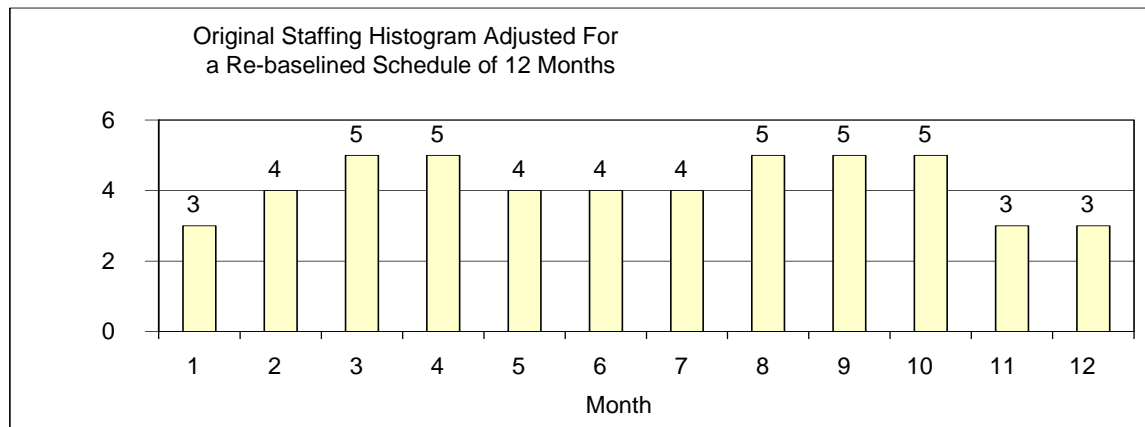


Figure 6. Original plan's staffing histogram adjusted for a re-baselined schedule of 12 months



After we have established the fourth benchmark, the *re-baselined schedule's staffing pattern*, we may go on to calculate the Re-baseline Staffing Index (RbSI) [an New Leaf Formula], and apply the RbSI to the re-baselined staffing histogram.

Fifth Benchmark: The RbSI and the Re-baselined Staffing Histogram

The *re-baselined staffing index* is derived from the original plan, and earlier re-baselined figures. The RbSI follows the familiar approach of the traditional earned-value indexes of CPI and SPI. For the RbSI, a value of:

- *Exactly 1.0* means things are *on plan*
- *Less than 1.0* means things are *behind plan*
- *Greater than 1.0* means things are *ahead of plan*

Because you usually re-baseline when you are behind plan, the RbSI is usually *less than* 1.0. Here are the calculations for our conservative example:

Re-baselined Staffing Index: the RbSI

$$\text{Re-baselined staffing index} = (\text{Original planned work remaining}) / (\text{Re-baselined planned work remaining})$$

$$\text{RbSI} = (\text{Original BAC} - \text{old current planned value}) / ((\text{Re-baselined cost BAC} - \text{new current planned value}))$$

$$\text{RbSI} = (1000 - 340) / (1272 - 370) = 660 / 902 = .73$$

As with the other earned-value indexes, you *divide* the original value by the index to arrive at the adjusted value:

Adjusting the Staffing Histogram with the RbSI to Get the Re-baselined Staffing Histogram

$$\text{Original staffing histogram figure} / \text{RbSI} = \text{Re-baselined staffing histogram figure}$$

$$5 \text{ Staff FTEs} / .73 = 6.8 \text{ Staff FTEs}$$

Figure 7 illustrates the result of applying the RbSI to the remaining original plan's staffing histogram. The table in Figure 8 shows that the re-baselined staffing histogram adds up to the correct 1272 staff-days by the end of Month 10.

Figure 7. Re-baselined plan's staffing histogram

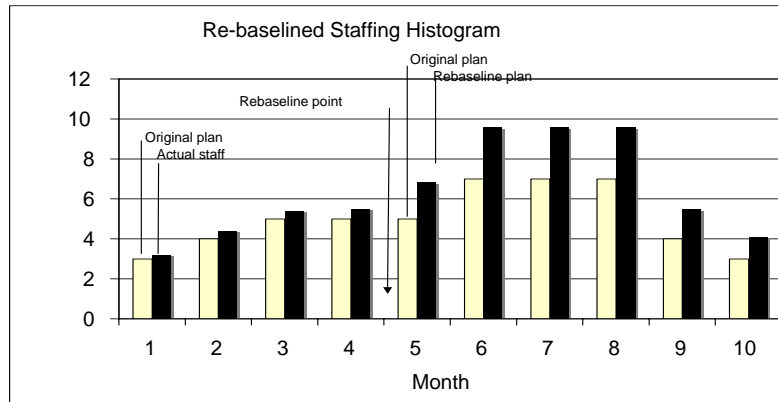


Figure 8. Re-baselined plan's staffing table

Month (Number)	Planned Staffing (FTEs)	Planned Value (Staff-days)	Actual Staffing / Re-baselined Staffing (FTEs)	Actual value/ Re-baselined plan (Staff-days)
1	3	60	3.2	64
2	4	140	4.4	152
3	5	240	5.4	260
4	5	340	5.5	370
5	5	440	6.8	507
6	7	580	9.6	698
7	7	720	9.6	889
8	7	860	9.6	1081
9	4	940	5.5	1190
10	3	1000	4.1	1272

The Sample Summarized

We began our re-baseline by setting the starting point of the new baseline to the current actual costs of 370 staff days. Next, we made the most conservative assumption that our Cost Variance was *typical* (so the rest of the project would be similarly affected) and we derived an EAC of 1156 staff-days. The EAC became our re-baseline's BAC. We adjusted the cost to include a 10% scope increase by adjusting the BAC to 1272 staff-days. We set our re-baselined schedule to be equal to the original date, and made sure we liked the re-baselined schedule's staffing pattern. Finally, we calculated a Re-baseline Staffing Index (RbSI) of .73, and created a re-baselined staffing histogram to complete the re-baselined work on time. Our final, conservative calculations, consistent with current data on the project and with our *typical* assumption, were for a re-baselined project of 1272 staff-days in 10 months.

Conclusion

The earned-value benchmarks can help you keep your re-baselined project consistent with your earned-value analysis.

1. Your re-baselined plan must begin at the earned-value benchmark, **the current actual cost.**
2. Your re-baselined cost must be at least as big as the earned-value benchmark, **the EAC with the irrelevant, typical or atypical variance assumption.**
3. Your re-baselined cost must be at least as big as the earned-value benchmark, **the EAC adjusted for the scope percentage.**
4. Your re-baselined schedule can be any value you choose, but your benchmark, **the re-baselined schedule's staffing pattern,** must include the **original staffing histogram spread out over your chosen re-baselined schedule.**
5. Your staffing plan should be at least as big as the benchmark, **the re-baselined staffing histogram,** that follows the re-baselined schedule's **staffing pattern** adjusted by the **benchmark, the Re-baselined Staffing Index (RbSI).**

While there are many ways to re-plan a project after you have decided to re-baseline, these five earned-value benchmarks show the minimum values that the re-

baselined plan must meet in order to be consistent with the past earned-value calculations.

Four exercises and their answers follow. *Please try each exercise on your own before checking on the answers.*

Exercise 1

A summary of the facts:

1. Original project cost: 1200 staff-days
2. Original project schedule: 12 months
3. Planned value: 500 staff-days at 5 months
4. Actual cost: 550
5. Earned value: 450
6. Monthly staffing plan: 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,

Earned-value data

1. CV: -100 staff-days
2. CPI: .82
3. EAC *atypical* variance: 1300 staff-days; *typical* variance: 1467 staff-days

Re-baseline assumptions:

1. The cost variance was *typical* [recommended by New Leaf] (and the rest of the project will have a proportional variance).
2. The scope percentage remains the same, 100%.
3. The re-baselined schedule is the current projected schedule.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for month 6?

Exercise 2

A summary of the facts:

1. Original project cost: 320 staff-days
2. Original project schedule: 4 months
3. Planned value: 80 staff-days at 1 month
4. Actual cost: 82
5. Earned value: 75
6. Current staffing: 4 FTEs level-staffed

Earned-value data

1. CV: -7 staff-days
2. CPI: .91
3. EAC *atypical* variance: 327 staff-days; *typical* variance: 350 staff-days

Re-baseline assumptions:

1. The cost variance was *atypical* (and the rest of the project will go as originally planned)
2. The scope percentage remains the same, 100%.
3. The re-baselined schedule is the current projected schedule.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for month 2?

Exercise 3

A summary of the facts:

1. Original project cost: 1808 staff-hours
2. Original project schedule: 64.5 days
3. Planned value: 824 staff-hours at 32 days
4. Actual cost: 919 staff-hours
5. Earned value: 736 staff-hours
6. Current staff: 3.5 FTEs

Earned-value data

1. CV: -183 staff-hours
2. CPI: .80
3. EAC *atypical* variance: 1991 staff-hours; *typical* variance: 2258 staff-hours

Re-baseline assumptions:

1. The cost variance was *typical* [recommended by New Leaf] (and the rest of the project will have a proportional variance).
2. The scope percentage is up to 115%.
3. The re-baselined schedule is the 72.2 days.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for day 33 if the original plan was for 3.5 staff FTEs?

Exercise 4

A summary of the facts:

1. Original project cost: 7368 staff-hours
2. Original project schedule: 48 weeks
3. Planned value: 4392 staff-hours at 29.4 weeks
4. Actual cost: 4144 staff-hours
5. Earned value: 3632 staff-hours
6. Current staff: 5 FTEs

Earned-value data

1. CV: -512 staff-hours
2. CPI: .88
3. EAC *atypical* variance: 7880 staff-hours; *typical* variance: 8407 staff-hours

Re-baseline assumptions:

1. The cost variance was *typical* [recommended by New Leaf] (and the rest of the project will have a proportional variance).
2. The scope percentage is up to 110%.
3. The re-baselined schedule is 70 weeks.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for the next time period if the original plan was for 5 staff FTEs?

ANSWERS TO EXERCISES 1-4

Answers to Exercise 1:

1. 550 staff-days
2. 1467 staff-days
3. 12 months
4. .76
5. 6.5 staff FTEs

Month (Number)	Planned Staffing (FTEs)	Planned Value (Staff-days)	Actual Staffng / Rbsln Staffng (FTEs)	Actual value/ Re-baselined plan (Staff-days)
1	5	100	5.0	100
2	5	200	5.3	206
3	5	300	5.5	316
4	5	400	5.7	430
5	5	500	6.0	550
6	5	600	6.5	681
7	5	700	6.5	812
8	5	800	6.5	943
9	5	900	6.5	1074
10	5	1000	6.5	1205
11	5	1100	6.5	1336
12	5	1200	6.5	1467

*Staffing Histogram for
Exercise 1*

Answers to Exercise 2:

1. 82 staff-days
2. 327 staff-days
3. 4 months
4. .98
5. 4.1 staff FTEs

Staffing Histogram for Exercise 2

Month (Number)	Planned Staffing (FTEs)	Planned Value (Staff-days)	Actual Staffng / Rbsln Stffng (FTEs)	Actual value/ Re-baselined plan (Staff-days)
1	4	80	4.1	82
2	4	160	4.1	164
3	4	240	4.1	245
4	4	320	4.1	327

Answers to Exercise 3:

1. 919 staff-hours
2. 2596 staff-hours
3. 72.2 days
4. .59
5. 6.0 staff FTEs

Answers to Exercise 4:

1. 4144 staff-hours
2. 9247 staff-hours
3. 70 weeks
4. .58
5. 8.6 staff FTEs

Mechanical Tools

Now that you have completed all four exercises, you may answer the first fifteen questions on the PDU questionnaire for a total of 4 PDUs. For two additional PDUs, solve the four additional exercises below and answer the five extra-credit questions. *To be sure your answers are correct:*

1. Construct a spreadsheet with all the formulas.
2. Check out your spreadsheet with the first four exercises to be sure your formulas give the correct answers.
3. Use the spreadsheet to generate answers to Exercise 5-8.

Here is an excerpt from a spreadsheet that was used to solve Exercise 2:

Initial data				
Data				
320	Budget in staff-days			
4.0	Schedule in months			
1.0	Current month			
80	Planned value			
82	Actual cost			
75	Earned value			
Re-baseline assumptions				
atypical	Assumptions about earned-value variances (typical or atypical)			
100%	Scope percentage			
4.0	Final desired re-baselined schedule in months			
Model				
Re-baselined figures				
82	Rebaselined planned value, earned value and current actual cost			
327	BAC adjusted for variance assumption			
327	BAC adjusted for scope percentage			
0.98	Rebaselined Staffing Index RbSI			
	Planned	Planned	Actual Staffng /	Actual value/
Month	Staffing	Value	Rbsln Staffng	Re-baselined plan
(Number)	(FTEs)	(Staff-days)	(FTEs)	(Staff-days)
1	4	80	4.1	82
2	4	160	4.1	164
3	4	240	4.1	245
4	4	320	4.1	327

Exercise 5

A summary of the facts:

1. Original project cost: 400 staff-days
2. Original project schedule: 4 months
3. Planned value: 80 staff-days at 1 month
4. Actual cost: 80
5. Earned value: 75
6. Current staffing: 4 people

Re-baseline assumptions:

1. The cost variance was *typical* [recommended by New Leaf] (and the rest of the project will have a proportional variance).
2. The scope percentage is 100%.
3. The re-baselined schedule is the original 4 months.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for Month 2 if the original plan was for 4 staff FTEs?

Exercise 6

A summary of the facts:

1. Original project cost: 1800 staff-hours
2. Original project schedule: 60 days
3. Planned value: 800 staff-hours at 30 days
4. Actual cost: 900
5. Earned value: 700
6. Current staff: 3.5

Re-baseline assumptions:

1. The cost variance was *typical* [recommended by New Leaf] (and the rest of the project will have a proportional variance).
2. The scope percentage is up to 115%.
3. The re-baselined schedule is 70 days.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for Day 31 if the original plan was for 3.5 staff FTEs?

Exercise 7

A summary of the facts:

1. Original project cost: 7400 staff-hours
2. Original project schedule: 48 weeks
3. Planned value: 4400 staff-hours at 30 weeks
4. Actual cost: 4100
5. Earned value: 3600
6. Current staff: 5 people

Re-baseline assumptions:

1. The cost variance was *typical* [recommended by New Leaf] (and the rest of the project will have a proportional variance).
2. The scope percentage is 90%.
3. The re-baselined schedule is the original schedule of 48 weeks.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for Week 31 if the original plan was for 5 staff FTEs?

Exercise 8

A summary of the facts:

1. Original project cost: 7000 staff-hours
2. Original project schedule: 48 weeks
3. Planned value: 4000 staff-hours at 30 weeks
4. Actual cost: 4100
5. Earned value: 3900
6. Current staff: 5 people

Re-baseline assumptions:

1. The cost variance was *atypical* (and the rest of the project will go as planned).
2. The scope percentage is up to 100%.
3. The re-baselined schedule is the original schedule of 48 weeks.

Re-baseline questions:

1. What are the re-baselined current planned value, re-baselined current earned value, and re-baselined current actual cost?
2. What is the re-baselined BAC?
3. What is the re-baselined schedule?
4. What is the RbSI?
5. What is the new staffing level for Week 31 if the original plan was for 5 staff FTEs?

Further Reading

When you have mastered the calculations that show you the earned value analysis for your project, you may want to read Mark Durrenberger's *An Earned Value Tutorial* to see a bit more about what it's like to use these tools on a real project.

If you would like more details on the RWI and the StSI, read John Nevison's *The Remaining Work Index (RWI) and the Staffing-to-Schedule Index (StSI): How to use New Leaf's new indexes to adjust staffing and make your schedule*.

If you want to try your hand at calculating basic earned-value figures and other project metrics read John Nevison's *Earned Value: Ideas and Exercises*.

All three articles are available on New Leaf's web site (NewleafPM.com) and **all can be studied to earn additional PDUs**.

About the Author

John M. (Jack) Nevison, PMP, is the author of six books and numerous articles on computing and management. During the course of his business career, Nevison has built and sold two businesses, managed projects, managed project managers, and served as both an internal and external consultant to Fortune 100 companies. He is past president of the Mass Bay Chapter of the Project Management Institute (PMI®), a past president of the Greater Boston Chapter of the Association for Computing Machinery (ACM), a certified Project Management Professional (PMP), and a Phi Beta Kappa graduate of Dartmouth.

About New Leaf Project Management

New Leaf is a provider of premier project-management training and consulting. Our comprehensive approach blends training with coaching for sustained practice improvement. We offer project management training for all levels of experience, from novice to veteran including preparation for the Project Management Professional (PMP) Exam. We often customize programs to meet individual client needs. By benchmarking project managers with our proprietary PM Competency Assessment we address our client's greatest needs first.

Score at least 70% correct on the questions below and earn PDUs! See last page for details.

PDU Questions: Earned Value: Benchmarks for Re-baselining

(\$39.95 for 4 PDUs or \$59.95 for 6 PDUs)

1. Cost variance equals?
 - a. Actual cost – earned value
 - b. Earned value – actual cost
 - c. Earned value – planned value
 - d. Planned value – earned value

2. Cost performance index equals?
 - a. Actual cost / earned value
 - b. Earned value / actual cost
 - c. Earned value / planned value
 - d. Planned value / earned value

3. Cost EAC equals?
 - a. BAC + CV
 - b. BAC * CPI
 - c. BAC / CV
 - d. BAC / CPI

4. Cost EAC with an atypical cost variance is?
 - a. BAC / CPI
 - b. BAC + |CV|
 - c. BAC * CPI
 - d. BAC + |SV|

5. Cost EAC with typical cost variance is?
 - a. BAC / CPI
 - b. BAC + |CV|
 - c. BAC * CPI
 - d. BAC + |SV|

6. Re-baselined planned value begins at?
 - a. Current earned value
 - b. Current planned value
 - c. Current actual cost
 - d. Last month

7. Re-baselined earned value begins at?
 - a. Current earned value
 - b. Current planned value
 - c. Current actual cost
 - d. Last month

8. The re-baselined BAC equals?
 - a. The old BAC
 - b. The old EAC
 - c. Current earned value
 - d. Current actual cost

9. Which of the following is NOT a benchmark
 - a. The current actual cost
 - b. The old EAC with a cost variance assumption
 - c. The old EAC adjusted for scope change
 - d. The current earned value

10. Which is not true about the RbSI?
 - a. It stands for Re-baselined Staffing Index
 - b. A value greater than 1.0 means things are behind plan
 - c. It equals $(\text{Original BAC} - \text{old current planned value}) / (\text{Re-baselined cost BAC} - \text{new current planned cost})$
 - d. It equals $(\text{Original planned work remaining}) / (\text{Re-baselined planned work remaining})$

Questions 11-20 assume:

8 staff-hours = 1 staff-day, 5 staff-days = 1 staff week, 4 staff-weeks = 1 staff-month.

11. Which exercise has the largest re-baselined cost?
 - a. Exercise 1
 - b. Exercise 2
 - c. Exercise 3
 - d. Exercise 4

12. Which exercise has the longest re-baselined schedule?
 - a. Exercise 1
 - b. Exercise 2
 - c. Exercise 3
 - d. Exercise 4

13. Which exercise has the worst RbSI?
 - a. Exercise 1
 - b. Exercise 2
 - c. Exercise 3
 - d. Exercise 4

14. Which exercise has the worst CPI?
 - a. Exercise 1
 - b. Exercise 2
 - c. Exercise 3
 - d. Exercise 4

15. Which assumption does New Leaf strongly recommend for cost variance?
 - a. The cost variance is typical
 - b. The cost variance is atypical
 - c. The cost variance is irrelevant
 - d. The cost variance is unreliable

16. Which assumption for the re-baselined schedule is false?
 - a. The re-baselined schedule is largely independent of the re-baselined cost
 - b. The re-baselined schedule can be longer than, the same as, or shorter than the original schedule
 - c. The re-baselined schedule can influence the pattern of the staffing histogram
 - d. The re-baselined schedule is determined by the re-baselined cost

Extra Credit for 2 Additional PDUs

17. Which exercise has the best (highest) CPI?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

18. Which exercise has the worst (lowest) RbSI?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

19. Which exercise has the highest re-baselined cost BAC?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

20. Which exercise made the assumption the cost variance was *atypical*?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

21. Which exercise has the shortest re-baselined schedule?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

22. Which exercise has the worst (lowest) RbSI?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

23. Which exercise has the highest re-baselined cost BAC?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

24. Which exercise made the assumption the cost variance was *atypical*?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

25. Which exercise has the shortest re-baselined schedule?
 - a. Exercise 5
 - b. Exercise 6
 - c. Exercise 7
 - d. Exercise 8

PDU Questions: EV Benchmarks

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