

EVMS Training Snippet Library:

Baseline Control Methods



Office of Acquisition and Project Management (OAPM) MA-60
U. S. Department of Energy
July 2014

Achieving Management and Operational Excellence

This EVMS Training Snippet, sponsored by the Office of Acquisition and Project Management (OAPM) discusses baseline revisions and the different baseline control vehicles used in DOE.



- **The performance measurement baseline (PMB) will likely change during the project**
- **Acquisition Guide Chapter 43.3 (March 2013) requires contract modifications to support certain changes, such as project scope or schedule completion**
- **Revisions must be controlled, documented, and incorporated in a timely manner**
 - Documented and approved before commencing work
 - Ensures the PMB reflects authorized project scope
 - Ensures the integrity of the PMB is maintained and reconciled with contract authorization

It is a given that during the life of the project, the performance measurement baseline (PMB) will change for a variety of reasons. These changes may affect the technical scope, schedule, and/or budget of the project. Revisions to the baseline may be necessary to maintain a valid work plan. In accordance with the DOE Acquisition Guide Chapter 43.3 (March 2013), certain changes cannot be made to the PMB, such as addition of scope to the contract, until the Contracting Officer (CO) has issued a contract modification.

Revisions to the baseline must be controlled, documented, and incorporated in a timely manner. As with the original work authorization process, work cannot commence prior to completion of documentation and approval. The control, documentation, and timely incorporation ensure the PMB reflects the authorized project scope, schedule, and budget. At all times the baseline must be maintained and reconciled with the contract authorization.

Types of Baseline Revisions



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- **Internally driven**
 - Within contract scope, schedule, and budget constraints
 - Only changes the shape (i.e. time phasing of activities) of the PMB curve
 - Contractor Project Manager approval
 - Replanning of future effort only; not current (within freeze period) or the past
- **Externally driven**
 - Authorized by Contracting Officer
 - Formal, signed contract modification
 - Project scope additions, deletions, changes
 - To/from DOE Contingency from/to Contract Budget Base

There are two types of baseline revisions: those internally driven by the contractor and those that are externally driven by the customer.

Internal re-planning is re-planning not only within the scope of work of the contract but also within the budget constraints of the contract's Contract Budget Base and the schedule that supports completion of contract milestones and the project. However, even though the change is an internal change that does not require a contract modification pursuant to Acquisition Guide 43.3 (March 2013), the customer should be notified of the change if it is significant. Usually this occurs through the formal periodic performance reports. Internal changes require contractor project manager approval. Replanning is limited to future effort. Replanning past or current period effort is considered retroactive and can only be done under very specific circumstances as stated in ANSI/EIA-748. For more information relative to the internal replanning of MR, refer to Snippet 4.3 MR vs. Contingency and Budget vs. Funds.

Externally driven changes must be authorized by the contracting officer. They are documented via contractual authorization. The purpose of the change will be scope driven, either to add, delete, or change the effort under contract. The budget comes from the DOE Contingency and changes the Contract Budget Base.

Required Documentation



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- **Baseline Change Proposal (BCP)**
 - Documents changes to the Performance Baseline
 - Requires DOE Acquisition Executive (AE) approval
 - May result in a contract modification if CBB (scope, schedule, budget) or funding (overrun) is changed
- **Budget Change Request (BCR)**
 - Internal adjustments to or within the Contract Budget Base (CBB) (project level)
 - Types:
 - BCR-P: Contractor internal replanning change within the **PMB**
 - BCR-M: Contractor allocation of **MR** to control accounts
 - BCR-C: FPD allocation of project **contingency** to the CBB (project level) for changes of scope; requires Contracting Officer action

The terminology on this slide is based on recommendations provided by EFCOG in the *Baseline Change Proposals and Contingency White Paper/Best Practice* published September 19th, 2013 and as defined in the *APM Glossary of Terms Handbook*.

A Baseline Change Proposal (BCP) is a document that provides a complete description of a proposed change to an approved performance baseline, including impacts on the project scope, schedule, design, methods, and cost baselines. The BCP represents a change to one or more of the elements of a project's Performance Baseline (PB) including the Total Project Cost (TPC), Critical Decision 4 (CD-4) completion date, or some feature of the project's scope and Key Performance Parameters (KPP), and must be approved by the applicable Acquisition Executive (AE).

A BCP may or may not result in a change to the CBB or contract. If the BCP results in scope changes to the contract, the CBB will be affected, and the contract must be modified by the CO. If the BCP is purely to address an overrun, then while the contract must be modified by the CO to address funding, the CBB would not change.

For in-scope changes to the *Performance Baseline (PB)*, Budget Change Requests (BCRs) document events that only require an internal adjustment to the performance baseline components and that do NOT change the TPC, CD-4 date, or represent a change to some feature of the project's scope and KPPs approved by the applicable Acquisition Executive. It may necessitate a contract action and/or changes to contractor documentation used to maintain configuration control (at the project level) of the Contract Budget Base (CBB) and/or Performance Measurement Baseline (PMB). While BCR is a common industry term, some contractors may use other terms as defined in their EVM System Descriptions.

Objective evidence supporting a change should be maintained with the BCR, and all changes should be reconcilable and traceable via project documentation and required EVMS budget logs.

Although the following terms and definitions are suggested to provide a common understanding of the different types of BCRs possible, this does not mandate contractor's changing their EVM System Descriptions.

- Budget Change Request – PMB (BCR-P): A type of BCR used by the contractor to maintain configuration control of the PMB for re-planning actions for remaining work scope. It is a normal project control process accomplished within the scope, schedule, and cost objectives of the project's PMB. A BCR-P requires Project Manager approval prior to implementation. A BCR-P is used for all internal changes with the exception of management reserve.
- Budget Change Request – MR (BCR-M): A type of BCR used by the contractor to allocate MR to Control Accounts within the PMB for authorized purposes. A BCR-M requires Project Manager approval prior to implementation. A BCR-M does not modify the contract.
- Budget Change Request – Contingency (BCR-C): A type of BCR used by the FPD to allocate project contingency to the contract for a change in scope to the contract. It results in a change to the CBB (project level) and requires Contracting Officer action to modify the contract.

Typical Reasons for Internal Replanning



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- **Non-contractually binding reasons:**
 - Change in execution strategy
 - Change in make versus buy decision
 - Reorganization
 - Rescheduling within the contractual milestone constraints
 - Application of Management Reserve (MR) to control accounts
 - Planning package to work package conversion
- **Changes to any contractually required technical execution strategies, key performance parameters, etc. require contract modification**

These are some of the most common reasons for internal re-planning. There may be a change in the make or buy decision or a schedule change that does not affect contract milestones. Reorganization might cause a significant change in the responsibility an organization has on the project. In all cases, the scope of work and the budget are re-planned together.

Often these types of re-planning do not require prior approval by the CO unless the change impacts the contract work statement which would result in a contract modification issued by the CO. Significant internal re-planning changes must simply be explained to the customer via the CPR or IPMR Format 5. This is so the customer will not be alarmed by changes evident in the time-phasing on Format 3 or in the BAC elements at the reporting levels in Formats 1 or 2.

Note that an internal re-plan can be accomplished at the total contract level, a specific WBS, or control account/work package level. The same constraints and guidelines apply at whatever level of the project a change is implemented.

Replanning Open Work Packages



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- **Replanning is limited to future, unopened work packages**
 - No changes to open work packages unless Government directed change or a Government approved OTB
- **Work packages should be short in duration**
 - Allows for replanning flexibility and benefits Government and Contractor by making performance measurement easily calculable
- **If Government directs a replan involving open work packages:**
 - Close work package; set BCWS equal to BCWP, preserve ACWP
 - Open a new work package to replan remaining BCWS and any additional BCWS authorized

Because replanning is limited to future (unopened) work packages, long work packages that stretch six months to a year into the future limit the contractor's flexibility to re-plan the effort. If that same long work package was identified into several shorter-span work packages, replanning would be allowable for those unopened ones existing in the future. So short-span work packages benefit the supplier by virtue of the additional flexibility they provide, and they benefit both the Government and the contractor by making performance measurement more easily calculable. If the Government approves re-planning of open work packages in the case of directed changes or an Over Target Baseline, the work package should be closed, setting BCWS equal to BCWP, preserving the ACWP. Then a new work package is opened to replan the remaining BCWS, and in the case of this discussion, incorporating a legitimate use of MR. The use of MR must be carefully identified to ensure it is being applied to future tasks and that the change in scope is documented.



- **Rubber Baseline**

- Deceptive PMB replanning activity; generates favorable cost or schedule variances to mask poor performance
 - Avoid schedule variance
 - Pushes BCWS originally planned for near term to far term to mask a schedule variance
 - Hide a cost variance
 - Pulls BCWS forward, disassociating it from the future scope for which it was intended, to mask a cost variance
 - Both of these methods only mask the issues temporarily and contribute to the surprise factor of unpredicted cost and schedule issues downstream

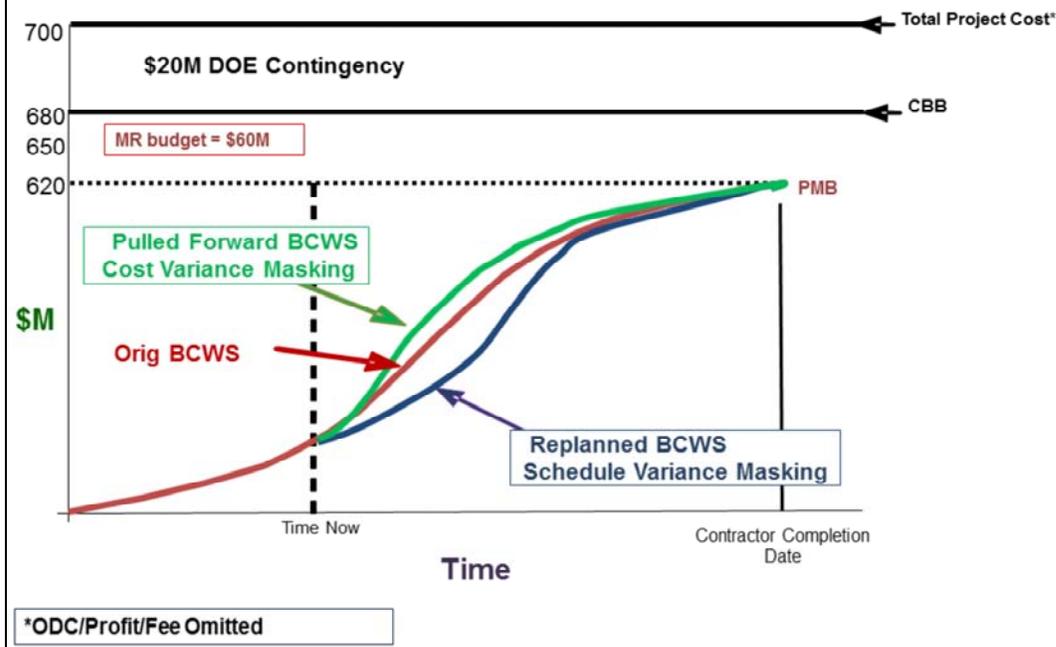
- **Application of significant MR early in the project**

Something to watch for with internal replanning is to ensure the contractor is not causing what is referred to as a rubber baseline. A rubber baseline is a deceptive PMB replanning activity. It generates favorable variances by adjusting the budgeted cost for work scheduled (BCWS) time phasing. A rubber baseline is indicated when one of two actions occur. To mask schedule slippages, near term work is pushed from the current and near term to the far term, i.e. later in the project. When BCWS is pushed forward, then the anticipated schedule variance is no longer visible until later in the project.

To mask cost variances, BCWS from far term work packages or planning packages is pulled forward to current or near term work packages without moving the associated work scope. Therefore, the earned value for the work accomplished, i.e. the BCWP, is greater since the budget associated with the near term work is now greater. When the actual cost of work performed (ACWP) is compared to the inflated earned value, the overrun disappears – for now. However, downstream when there is insufficient budget to perform the remaining scope, the overrun will reappear and increase at a high rate, thus resulting in unforeseen overruns near project completion.

Internal replanning for significant or repeated applications of management reserve early in the project must be monitored. For example, if the project schedule is 5 years long, using up most of the MR in the first 18 months to minimize variances instead of identifying the actual issues and correcting the root causes, has a significant probability to result in uncontrollable cost growth later in the project.

Internal Replanning: Rubber Baseline



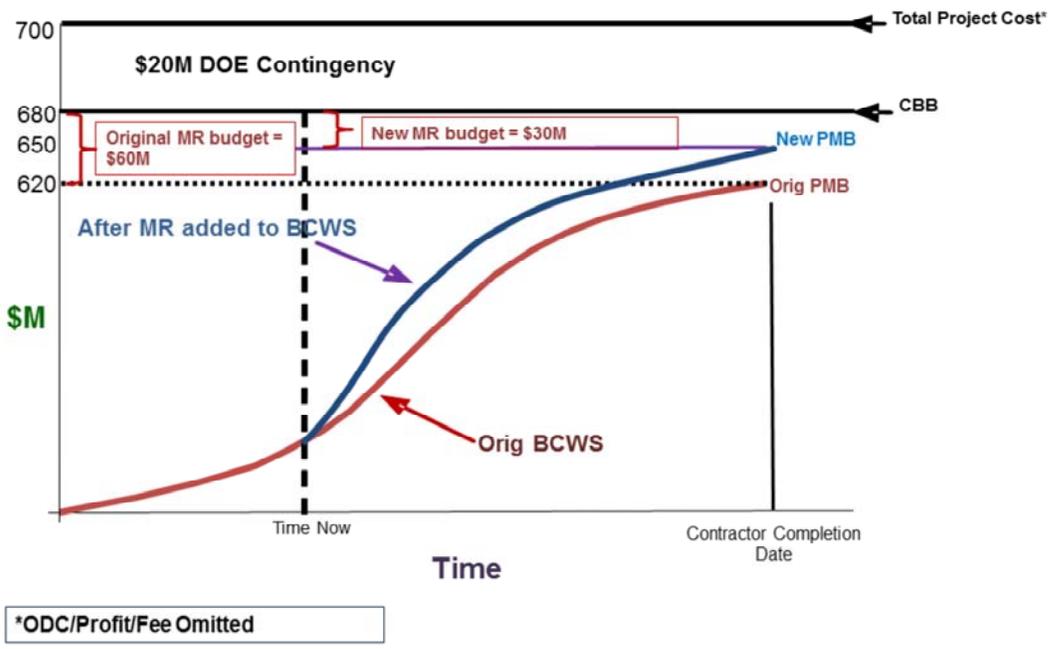
Here is a chart showing a picture of all the relationships in internal replanning. Note that the internal replan is performed within the CBB. In the case illustrated here, a budget change request was approved to set the BCWS equal to the BCWP at time now. The caution when seeing this is to fully understand why it was done. No management reserve was used in this example; only the BCWS time phasing was changed.

The situation shown here could be thought of as a type of “rubber baseline” depending on how and when the revision took place. The revised baseline we show here in blue moved work from “Time Now” into the future. In other words, scheduled work was pushed out in time without changing the schedule’s end date, likely to avoid a schedule variance.

Another concern is if the replanning was done to pull BCWS forward (robbing budget from future work effort) to temporarily hide a cost variance. Remember internal replanning only changes the shape of the PMB curve by adjusting the time phasing of the activities and does not impact the CBB or TPC. If the time phasing of activities is unrealistic, then so is the PMB.

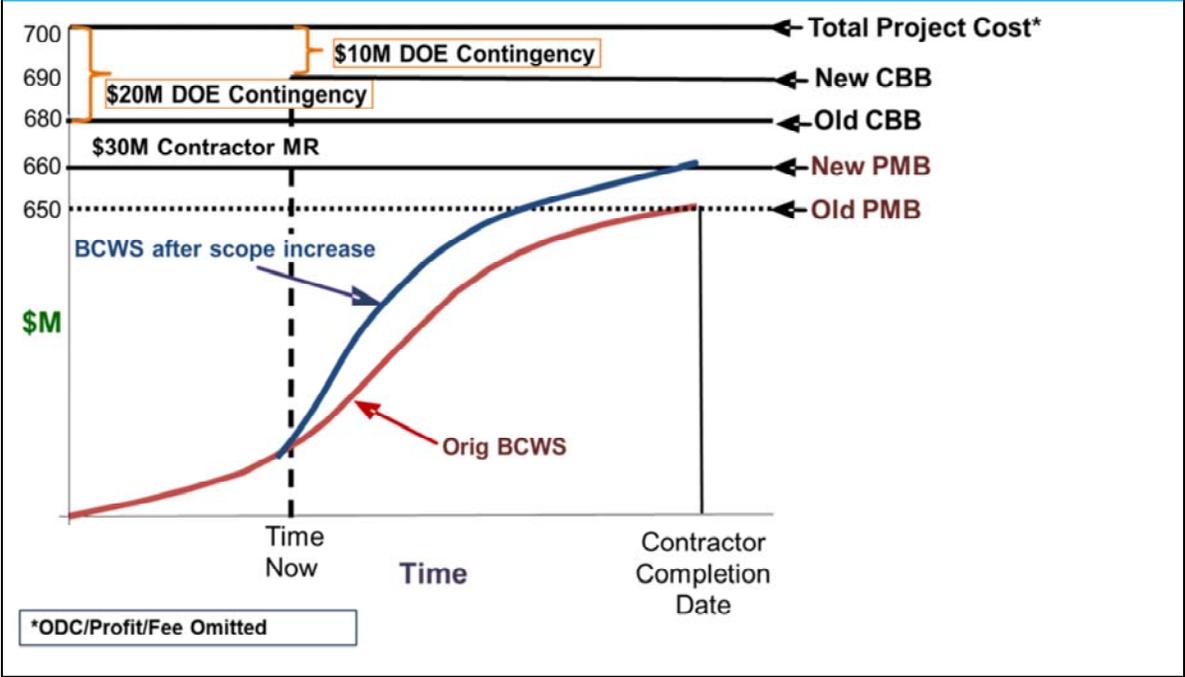
In both examples, the effect on the curve is a steep rise, either earlier than planned (green curve) or later than originally planned (blue curve). It would be logical to question the contractor regarding how it will provide the resources to support that curve. The schedule should also be reviewed for changes to task durations and the impact to the critical path. These, and other analyses, would indicate the realism of the revised baseline.

Internal Replanning Using MR



This graph shows the difference to the time phased budgeted cost for work scheduled after \$30M of Management Reserve was added during an internal change. The CBB did not change. The PMB increased by \$30M, from \$620M to \$650M. There is no change to the DOE contingency or to the TPC for internal applications of MR. You can see how the time phasing of the BCWS changed (blue line) after the injection of \$30M of MR.

Internal Replanning as a Result of Contract Modification



In this example we are showing the effects of a contract modification adding \$10M worth of scope from the DOE Contingency. The CBB increased from \$680M to \$690M. The PMB increased from \$650M to \$660M. The DOE Contingency decreased from \$20M to \$10M. There was no change to the MR budget.

Typical Reasons for External Replanning

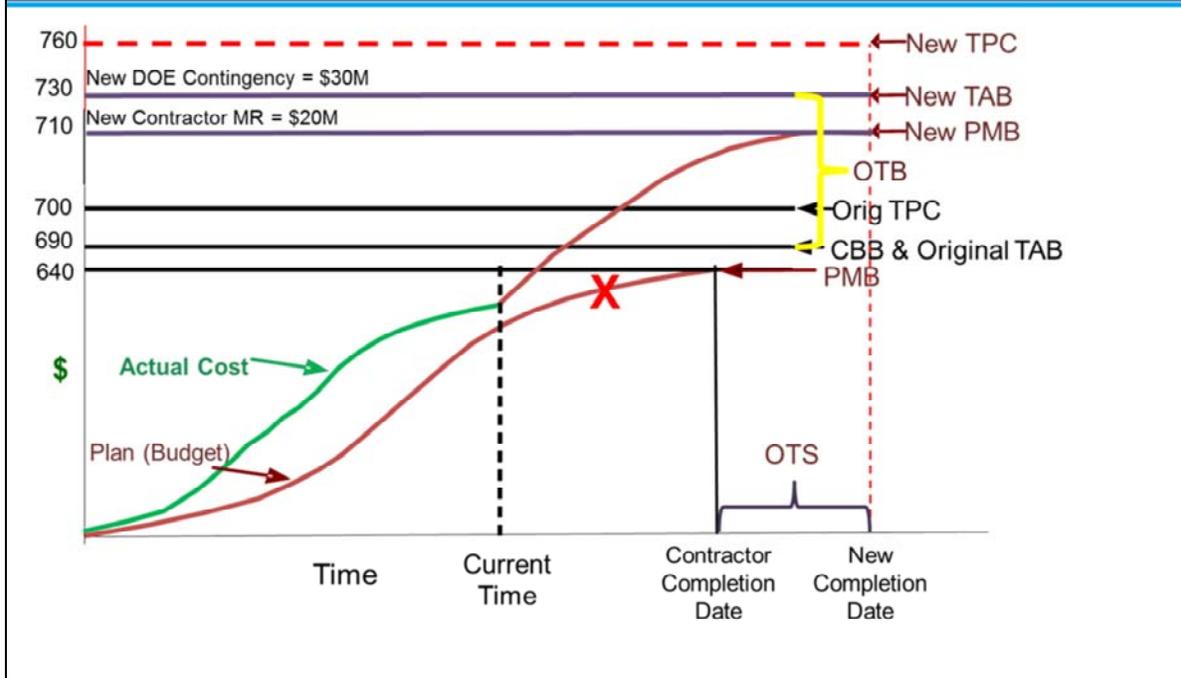


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- **Negotiated/Definitized contract changes**
 - Scope addition/deletion
 - Schedule change (e.g., extend/compress schedule)
 - Change to funding plan
- **Authorized Unpriced Work**
- **These actions are only valid if formally issued by the Contracting officer**
 - Verbal or written direction by anyone other than the CO is not valid

External replanning is driven by Contracting Officer direction only. Examples would be negotiated or definitized contract changes involving scope additions or deletions, a directed schedule change, or a change to the funding plan. Authorized unpriced work is an example of contractual direction to proceed with work prior to the final negotiations for the effort as stated in the Acquisition Guide 43.3 (March 2013). Contractual direction can only be authorized by the DOE Contracting Officer.

External Replan – New TPC Approved



In this example, a BCP was approved and a contract modification issued to increase the Total Project Cost from \$700M to \$760M. The cause for this was an Over Target Baseline requested by the contractor and approved by the customer. The New TPC, TAB, PMB along with the Over Target Baseline (OTB) and Over Target Schedule (OTS) are shown on this slide.

For more information on Over Target Baselines and Over Target Schedules, please refer to Snippet 4.1.

DOE OAPM EVM Home Page



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Earned Value Management (EVM) is a systematic approach to the integration and measurement of cost, schedule, and technical (scope) accomplishments on a project or task. It provides both the government and contractors the ability to examine detailed schedule information, critical program and technical milestones, and cost data.

- EVMS Surveillance Standard Operating Procedure (ESSOP) - 26 Sep 2011 (pdf)
- EV Guideline Assessment Templates - (MS Word)
- DOE EVMS Cross Reference Checklist - (pdf)
- DOE EVMS Risk Assessment Matrix - (MS Word)
- Formulas and Terminology "Gold Card" - Sep 2011 (pdf)
- Slides from the OECM Road Show: Earned Value (EV) Analysis and Project Assessment & Reporting System (PARS II) - May 2012 (pdf)
- DOE EVM Guidance

EVM TUTORIALS

Module 1 - Introduction to Earned Value (pdf 446.86 kb) July 17, 2003

This module is the introduction to a series of online tutorials designed to enhance your understanding of Earned Value Management. This module's objective is to introduce you to Earned Value and outline the blueprint for the succeeding modules. This module defines Earned Value management. It looks at the differences between Traditional management and Earned Value management, examines how Earned Value management fits into a program and project environment, and defines the framework necessary for proper Earned Value management implementation.

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For information relative to EVMS procedures, templates, helpful references, and training materials, please refer to OAPM's EVM Home page. Check back periodically for updated or new information.

Thank you