

# How to Estimate and Use Management Reserve in an EVM System

Earned Value Management Systems Best Practices

Presented by

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# Management Reserve (MR) defined

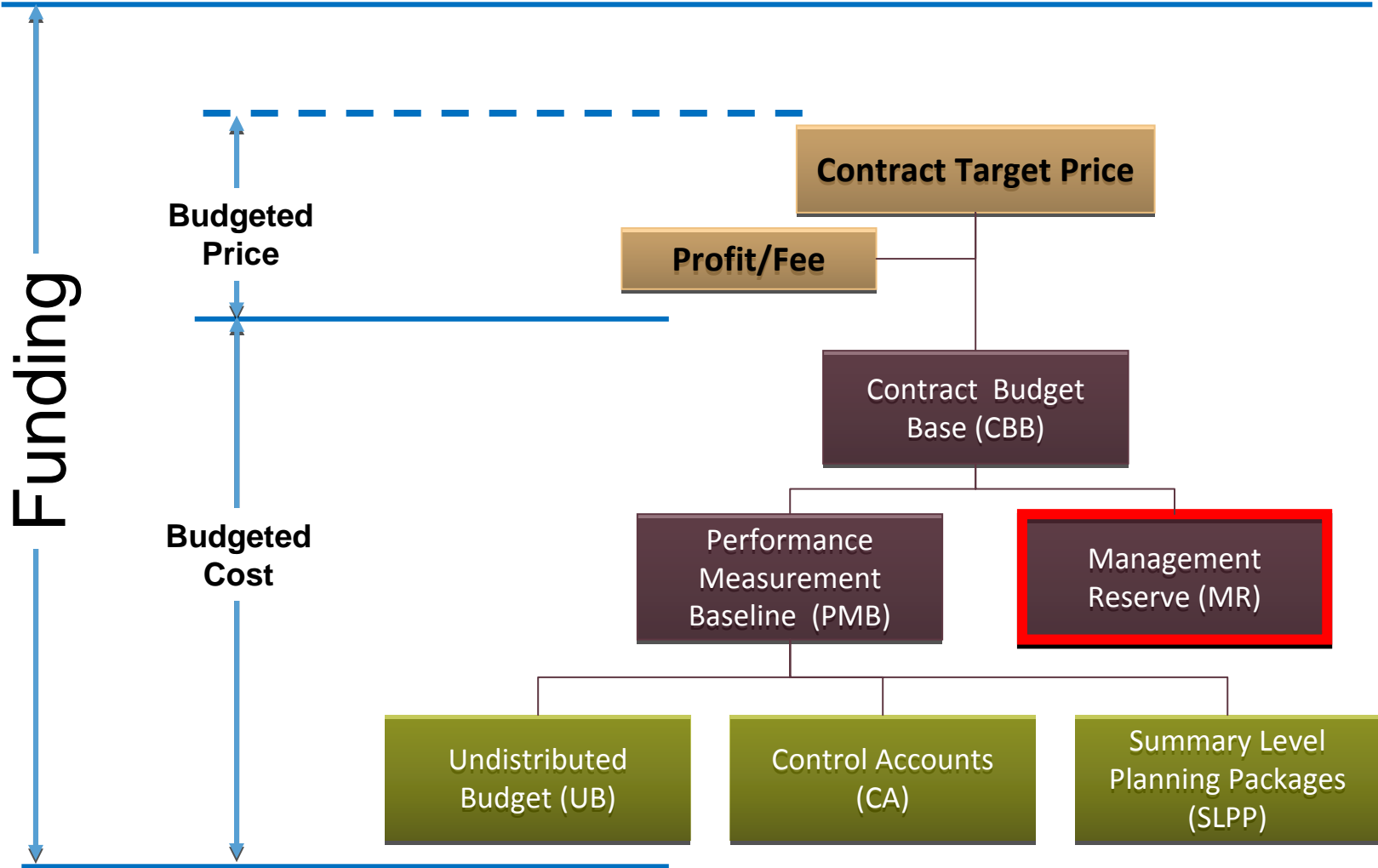
- “An amount of the total budget withheld for management control purposes, rather than being designated for the accomplishment of a specific task or set of tasks” (ANSI/EIA 748-B)
  - Meant to address “in scope changes” that were not planned in baseline
  - The Contractor has authority and control over discretionary use of MR budget
  - Not included in PMB, as it has not been allocated for specific work scope
  - Must be formally allocated to work packages through an internal change control process

**A rule, that is often violated, is from the ANSI 748 standard which says –**

**“MR is not a contingency that can be eliminated from prices during subsequent negotiations or used to absorb the cost of program changes. The budget being held in reserve must not be viewed by a customer as source of funding for added work scope”.**



# Budget and Funding Relationships



# Challenges to the Establishment of MR

- For EVMS purposes, MR is expected
- MR not formally recognized by the Federal Acquisition Regulations (FAR)
  - FAR 31.205-7 (c)
- This conflict has perpetuated mindset that MR should be “buried” within allowable cost elements proposed
  - Once contract is negotiated, contractor then sets aside an amount from CBB for MR



# There are no rules defining how much MR

- In the past, contractors would hold back a percentage, e.g., 10%, from the negotiated budget for MR and distribute the remainder to the Control Accounts.
- This is no longer considered a best practice
- These days, risk management is well-integrated with both cost estimating and earned value management and should be the basis for estimating MR

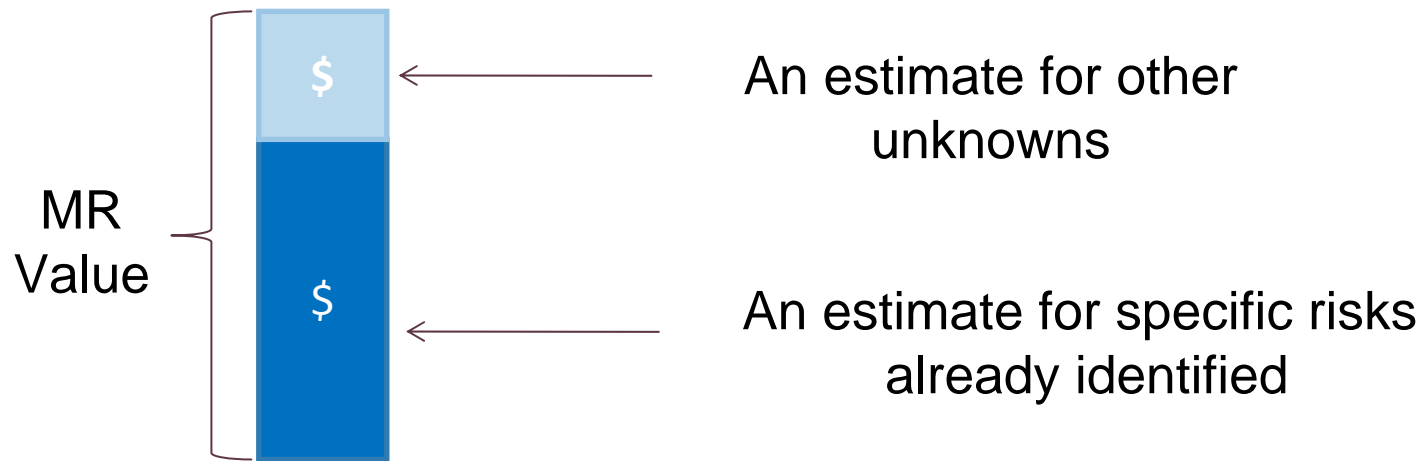
# Recommended Practice to Establish MR

- MR establishment / use should be directly related to risk
  - Conduct risk analysis to identify program risks (and opportunities) during proposal development
    - ✓ Quantify impacts of identified risk events and price in mitigation measures to extent possible
  - Once contract is awarded, refine / reassess mitigation measure(s) included for each risk event
    - ✓ Reduce / transfer value of high cost mitigations to MR
    - ✓ Reevaluate risks and associated MR throughout execution of the contract
  - MR allocated during execution of contract should be directly tied to amount associated with each identified risk



# Developing an MR Estimate Based on Risk Analysis

- Where to start



- New risks are identified as program progresses
  - These may be part of the original SOW or part of a change proposal
- MR can be taken from a change estimate before distribution in the same manner as it was developed originally

# A Best Practice for Estimating MR

1. Conduct risk analysis to identify program risks (and opportunities) during proposal development

2. Quantify the impacts of identified risk events and price in mitigation measures to extent possible to match the probability of occurrence that you are willing to accept. For instance you may bid the contract with risk elements quantified at an 80% probability of success.

- The risk log should have a value associated with each risk



## A Best Practice for Estimating MR (CONT)

3. When the contract is awarded, budget the Control Accounts at a lower level of probability of success and retain the difference in MR.
  - For example; if a task will cost \$110,000 with an 80% probability of success; and
  - The Control Account may be budgeted at \$100,000 (based on a 50% probability of success)
  - The remaining \$10,000 is maintained in MR
  
4. It is still necessary to create an amount of “non-specific” MR. “Non-specific” MR does not tie to a specific risk. The quantification of this complete unknown is based on management judgment, the type work, and the experience with this type of project.

# How can you Replenish MR?

- Management reserve can be replenished in two ways.
  - Via changes to the contract
  - Via prospective replanning, to remove budget that

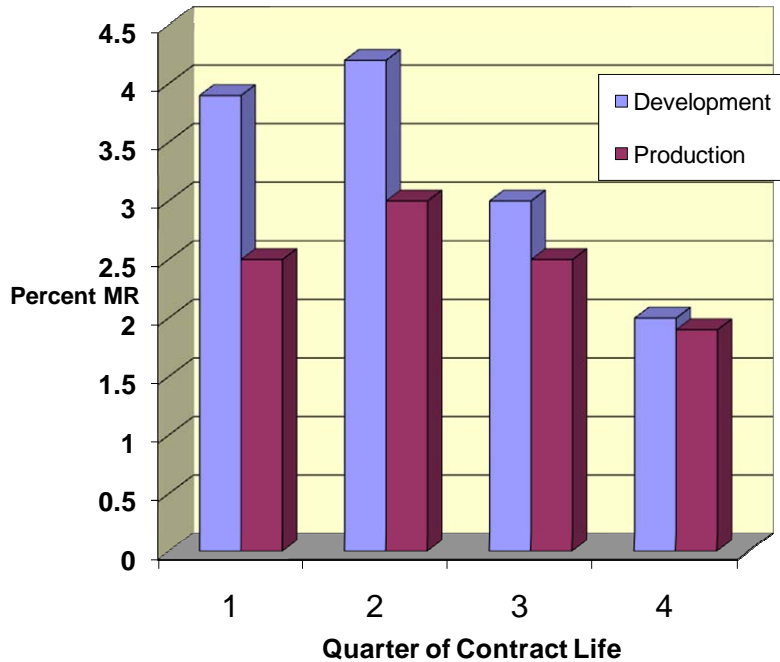
# Industry Averages for MR

- Data are from Defense Acquisition Executive Summary (DAES)
- Period covered was 1975-1998
- Over 500 completed and ongoing contracts were included
- DAES reports reflect summarization of information from contractor cost performance reports (CPRs)

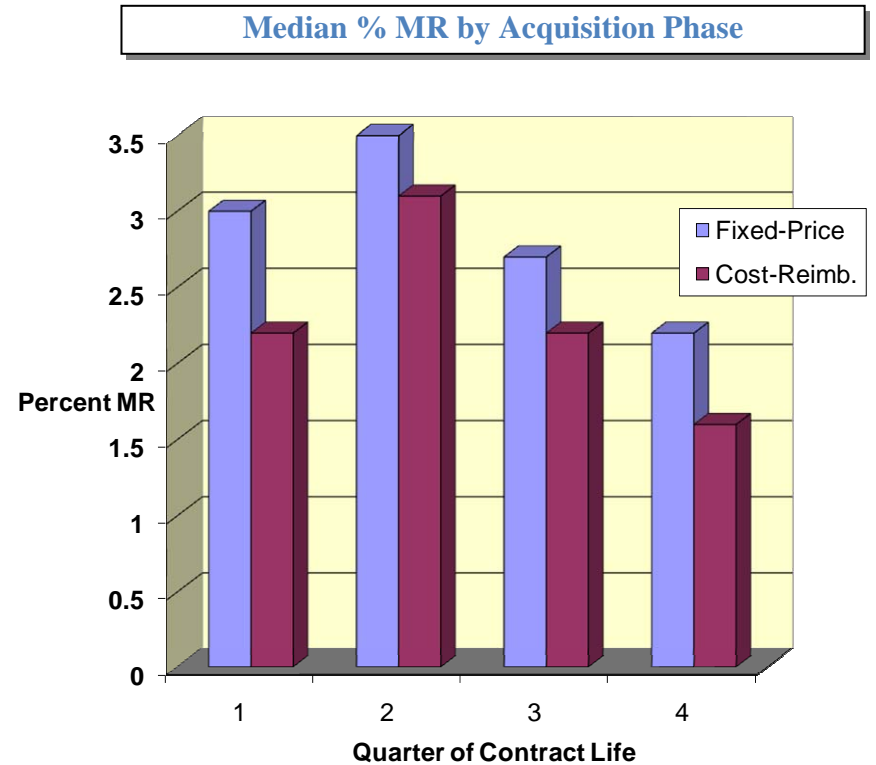
Based on and drawn from a paper in  
*Acquisition Quarterly Review - Summer 2000*

By: David Christiansen and Carl Templin

# Median Management Reserve Percentage



Median % MR by Contract Category



Median % MR by Acquisition Phase

# Final Thoughts From Study

- Statistics don't tell what is right for any given contract
  - May be useful as benchmark
  - Conditions vary from contract to contract
- Risk is the single most significant factor to consider



# Recommended Practice for the use of MR

- MR is for changes to the planned work that is not out-of-scope to the contract
- It is budget used to plan and track the “new work” in a Control Account
  - It is added as a new work package
  - It is not added to an existing work package

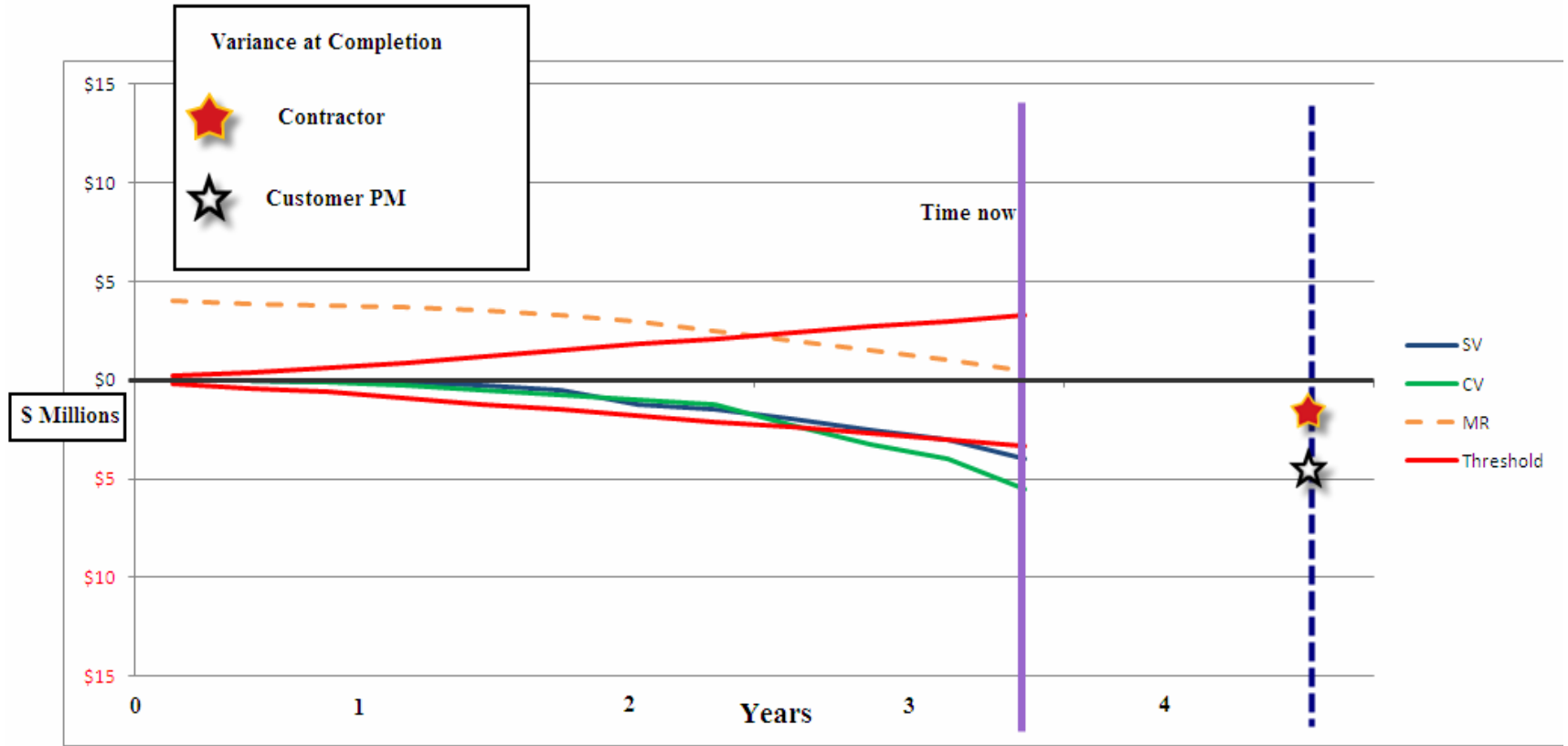
Example #1 – as part of the development plan, an initial build of a prototype unit was to be shipped to another facility for testing. While in shipment, the unit sustained \$300,000 worth of damage. The unit will have to be rebuilt and the entire schedule now has to be changed. Tracking this in-scope change requires that the new work be planned and scheduled.

Example #2 – the source code development testing and correcting cycle was estimated to require three repetitions for a 60% probability of success, but could require up to six cycles. If each of these cycles takes a month and \$100,000, each repetition will have a significant impact on the project and needs to be tracked. At the end of three cycles, the code was still not error free enough to pass testing and it was determined that it would take 2 more cycles.

# MR is reported on the CPR every Month

- MR is reported on the Contract Performance Report (CPR) as a lump sum on formats 1 & 2.
- All uses of the MR would be seen in the baseline change in CPR Format 3 and the description of the uses would be explained in Format 5.
- It should be maintained in an MR Log that tracks all of the additions to and uses of, MR. This log and process should be identified in your change control procedures.

# Tracking the use of MR Against Variances



Estimated  
Completion  
Date



# Monitoring Management Reserve

- Have you been conserving or expending your MR?

$$\% \text{ MR Remaining} = \frac{\text{MR Remaining}}{\text{Initial MR} + \text{MR From Changes}} \times 100$$

$$\% \text{ MR Applied} = \frac{\text{MR Applied}}{\text{Initial MR} + \text{MR From Changes}} \times 100$$

# Is an MR distribution considered Replanning, Rebaselining or Reprogramming?

## Replanning

- The redistribution of existing budget for future work
  - Routine actions associated with rolling wave process
  - “Typical” MR transactions
  - Shifts of work and planning packages that don’t affect any higher level milestones or control account constraints
- Can lead to minor changes in baseline time phasing, but should not be considered a form of “rebaselining”
  - Does not require government client approval
  - Should have no impact on fee potential

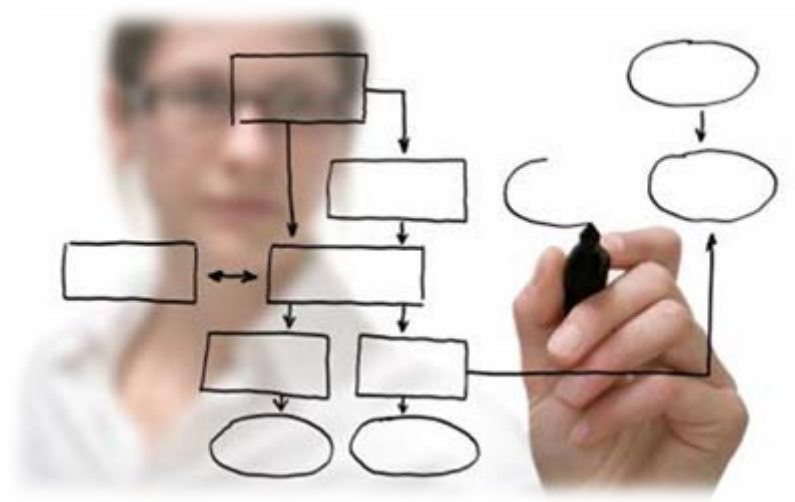


# How are Replanning, Rebaselining and Reprogramming Different?

## Rebaselining (not "official" EVMS terminology)

- Significant replanning actions impacting many control accounts
  - Increases / decreases to future work and budgets
  - Shifts in timing of intermediate milestones\*
  - Shifts in phasing of work
- Used in response to the following events
  - PDR / CDR
  - Changes to incremental funding profile
- **Consistent with current constraints**
  - Within CBB
  - Within contract schedule

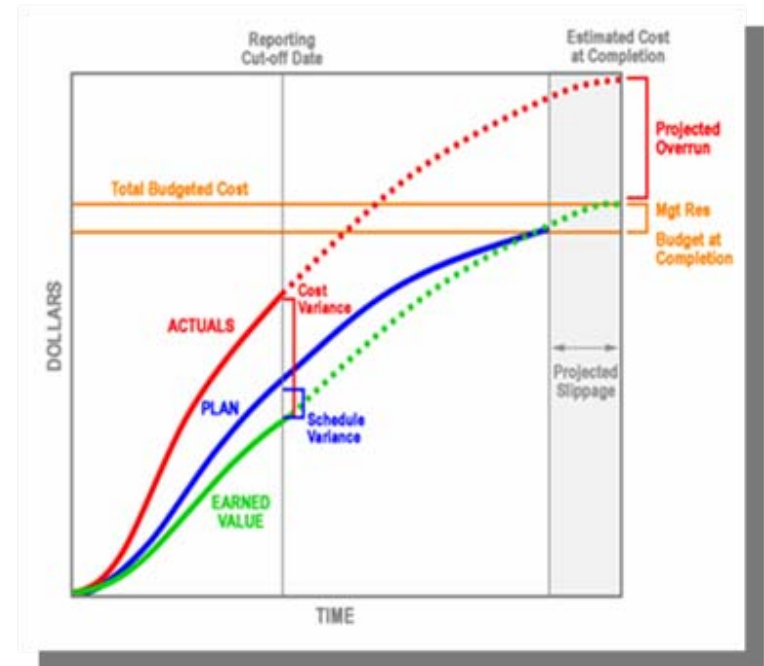
\* May require government client approval; fee potential may be impacted



# How are Replanning, Rebaselining and Reprogramming Different?

## Reprogramming

- Contractor has concluded that budget (and / or schedule) for performing remaining work is insufficient
  - No longer represents realistic plan
- Contractor requests to implement an “over target baseline” (OTB) and / or “over target schedule” (OTS)
  - $OTB = CBB + overrun = TAB$
  - $OTS = \text{beyond contractual duration}$
- *May* require advance approval of government client
  - Allowable costs still reimbursable
  - Fee potential will definitely be impacted



# Questions?

- How does SM&A know this information?
  - 400+ consultants supported over 100 successful validations across multiple agencies
  - Trained over 9,000 students in EVM basics and advanced subjects
  - **PROJECT SCHEDULING & EVMS Public Seminars**



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