

“Triple” Gold Card®

Quick Reference Guide for Earned Value Management

This quick reference guide and checklist addresses Cost, Schedule, and Performance (thus TRIPLE) while touching on all five major areas of the Earned Value Management System (EVMS).

Earned Value Management is a methodology that considers a discrete project's scope (performance), time (networked schedule), resources (people and materials), and their related uncertainties (risks) in an integrated system that meets the intent of the ANSI/EIA-748 EVMS Standard.

The Standard guidelines are grouped into five major categories:

- 1. Organization** – define work (WBS), organization (OBS), and related integrated processes...
- 2. Planning, Scheduling, and Budgeting** – develop a discrete time-phased budget baseline which identifies work with physical products, milestones, performance goals, and other indicators of progress...
- 3. Accounting Considerations** – valid, timely, and auditable information...
- 4. Analysis and Management Reports** – at least monthly at control account and other levels...
- 5. Revisions and Data Maintenance** – authorized changes are controlled, timely...

References

Office of Management and Budget www.whitehouse.gov/omb Circular A-11, Supplement to Part 7- Capital Programming Guide

Federal Acquisition Regulations www.acquisition.gov/far/
52.234-2 Notice of EVM System - Pre-Award IBR
52.234-3 Notice of EVM System - Post Award IBR
52.234-4 Earned Value Management System

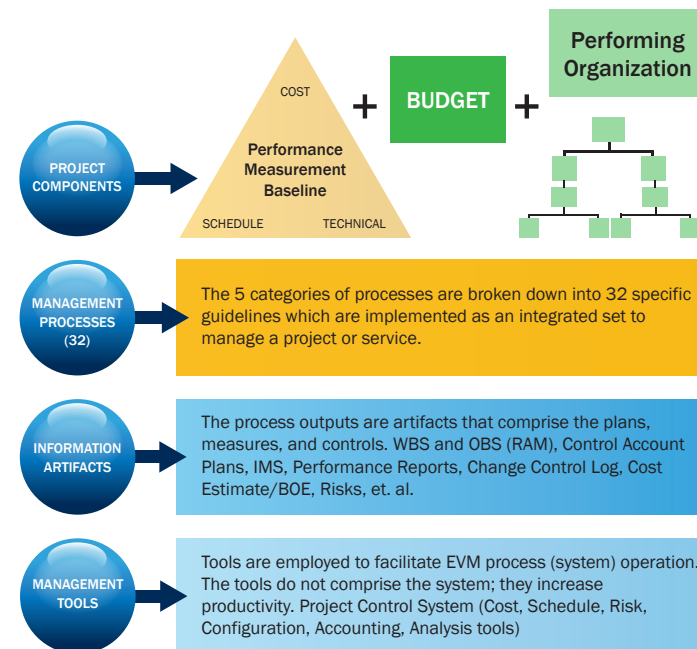
Military Standard
WBS MIL-STD-881

Data Item Descriptions (DIDs) <https://assist.dla.mil/>
CWBS DI-MGMT-81334 IMS DI-MGMT-81650
CPR DI-MGMT-81466 IPMDAR DI-MGMT-81861

Guidance www.ansi.org www.gao.gov www.ndia.org/ipmd <https://ndia.org>
GAO-16-89G GAO Schedule Assessment Guide
GAO-20-195G GAO Cost Estimating and Assessment Guide
Earned Value Management Systems Intent Guide
Earned Value Management Systems Application Guide
NDIA Earned Value Management Systems Intent Guide to the EIA Standard for EVMS (EIA-748-D)
NDIA Industry Practice Guide for Agile on Earned Value Management Programs
NDIA Integrated Baseline Review Guide

EVM in Perspective

EVM does not exist in isolation. It must be employed in the execution of some work to create or produce something of value (a project or service with the attributes of cost, schedule, and technical) with a clear start and stop related to the product/service. EVM integrates various project components. The Performance Measurement Baseline (PMB) represents the time-phased, costed technical performance.



Performance Assessment/Analysis

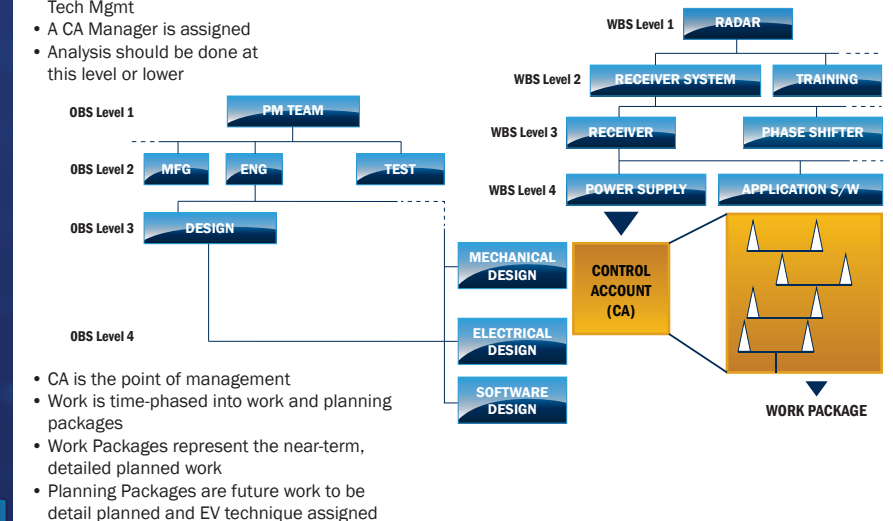
SPA's LCAA - Linked CREST Assessment and Analysis

A four-gate process that assists Program Management teams in capturing fundamentals of Integrated Program Management to exploit the synergy generated by linking CREST knowledge areas using longstanding quantitative disciplines at the Control Account level (or lowest level available). This process produces robust, statistically developed, quantified cost and schedule views that cut through the fog to provide clear, actionable information to the program management team.

Cost Estimating and Basis of Estimate Analysis
Risk/Opportunity Assessment Analysis
Earned Value Assessment and Analysis
Schedule Assessment and IMS Analysis
Technical Performance Measurement and Analysis

Define the Control Accounts

- Focus for Cost/Schedule/Tech Mgmt
- A CA Manager is assigned
- Analysis should be done at this level or lower



Planning, Scheduling, and Budgeting

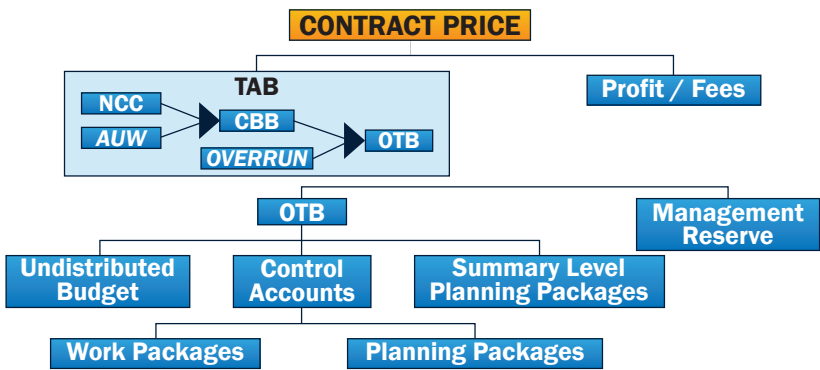
Plan the work by breaking the control accounts into work packages that can be “easily” executed.

Schedule the work using a Critical Path Methodology schedule.
Budget the work by assigning resources to the schedule elements.
Earned Value Techniques (suggested implementations)

- A - Level of Effort** (Work that is impossible or impractical to measure)
- B - Weighted Milestones** (At least one milestone per month)
- C - Percent Complete** (Subjective estimate of performance; 3–6 months)
- D - Units Complete** (Production lots; each item is assigned an equivalent cost)
- E - 50/50** (Fixed formula 50% to start, 50% to finish; not more than 2 months)
- F - 0/100** (Fixed formula 0% to start, 100% to finish; not more than 1 month)
- G - 100/0** (Fixed formula 100% to start, 0% to finish; not more than 1 month)
- H - User-Defined** (User-defined fixed formula; not more than 2 months)
- I - Apportioned Effort** (Performance is based on another control account)
- J - Planning Package** (Future work planned at a high level)
- K - BE% Complete** (Budget element percent complete; subjective estimate)
- L - Calculated Apportioned** (Performance based on percentage of other CA)

Earned Value techniques should reflect the control account technical performance measures and risk profile

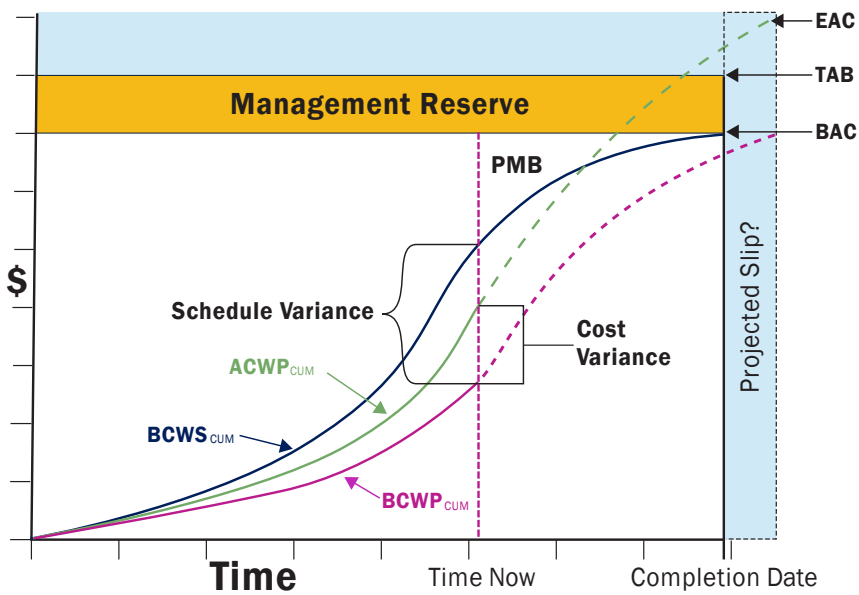
Establish the Performance Measurement Baseline



Accounting Considerations

- Record/reconcile costs with accounting system at the control account or lower
- Record and allocate indirect costs in accordance with established procedures
- Record costs for work performed in same period that earned value is measured

Analysis and Management Reports
Measure and Report Performance Monthly



Report the Data and Analyze the Variances

Variances - Favorable is Positive, Unfavorable is Negative
Cost Variance $CV = BCWP - ACWP$ $CV\% = (CV/BCWP) * 100$
Schedule Variance $SV = BCWP - BCWS$ $SV\% = (SV/BCWS) * 100$
Variance at Completion $VAC = BAC - EAC$

Performance Indices - Favorable is >, Unfavorable is <1
Cost Efficiency $CPI = BCWP/ACWP$
Schedule Efficiency $SPI = BCWP/BCWS$

Overall Status
 $\% \text{ Schedule} = (BCWS_{cum} / BAC) * 100$
 $\% \text{ Complete} = (BCWP_{cum} / BAC) * 100$
 $\% \text{ Spent} = (ACWP_{cum} / BAC) * 100$

Estimate At Completion
 $EAC (LRE) = \text{Actuals to Date} + [(\text{Remaining Work}) / (\text{Efficiency Factor})]$
 $EAC_{cpi} = ACWP_{cum} + [(BAC - BCWP_{cum}) / CPI_{cum}]$
 $EAC_{composite} = ACWP_{cum} + [(BAC - BCWP_{cum}) / (CPI_{cum} * SPI_{cum})]$
To Complete Performance Index (TCPI)
 $TCPI = \text{Work Remaining} / \text{Cost Remaining} = (BAC - BCWP_{cum}) / (EAC - ACWP_{cum})$

To Complete Schedule Performance Index (TSPI)
 $TSPI = \text{Schedule Remaining} / \text{Time Remaining} = (\text{Planned Duration} - \text{Earned Schedule}_{cum}) / (ECD - \text{Actual Time})$

Variance Analysis
Variances that exceed thresholds must be analyzed and explanations provided: Problem, Root Cause, Impact, Corrective Action, and Get Well Date
Address: Poor Planning, Rate Variances, Technical Problems, Risks, Effect on Control Account, and Effect on Contract

Revisions and Data Maintenance

- Incorporate changes: in a timely manner, prior to or with start of effort
- Control retroactive changes and control revisions to the baseline

Glossary

ACWP- Actual Cost for Work Performed: Cost of work accomplished = ACTUAL COST (AC)
AT - Actual Time (months)
BCWP- Budgeted Cost of Work Performed: Value of work accomplished = EARNED VALUE (EV)
BCWS- Budgeted Cost of Work Scheduled: Value of work planned to accomplished = PLAN VALUE (PV)
BAC - Budget at Completion: Total budget for total contract through any given level
CA - Control Account: Lowest CWBS element assigned to a single focal point to plan and control technical/cost/risk/schedule
CBB - Contract Budget Base: Sum of all work scope assigned to a designated contract
CCB - Configuration Control Board
EAC - Estimate at Complete: The best estimate of the total cost at the completion of the program
ECD - Estimated Completion Date
ES - **Earned Schedule**: A time-based measure of actual work completed (months, weeks, days, etc.)
LRE - Latest Revised Estimate: Contractor's EAC or EAC
PD - **Planned Duration** (months, weeks, days, etc.)
MR - Management Reserve: Budget withheld by Ktr PM for unknown risk management
NCC - Negotiated Contract Cost
PMB - Performance Measurement Baseline: Program time – phased budget plan
PP - Planning Package: CA activities not yet detail planned
SLPP - Summary Level Planning Package: Far-term activities not yet defined into CAs
TAB - Total Allocated Budget: Sum of all budgets for work on contract = NCC, CBB, or OTB
TCPI - To Complete Performance Index: Efficiency needed from time now to achieve an EAC
TSPI - To Complete Schedule Performance Index: Efficiency needed from time now to achieve completion date
UB - Undistributed Budget: Broadly defined activities not yet distributed to CAs
WP - Work Package: Near-term, detail-planned activities within a CA

Earned Value Management Best Practice

- Organization**
- WBS top level clearly describes one end-product or deliverable
 - WBS represents the entire technical scope and represents products and not budget categories, organizations, personnel, tasks, functions, or project phases
 - Each WBS subordinate element has only one parent
 - Each subcontracted effort is assigned to a single WBS element (unless subcontractor is responsible for multiple components)

- Planning, Scheduling, and Budgeting**
- All tasks have unique names with milestones representing key events
 - Work Packages are not identified as WBS elements
 - Work Packages average less than 90 days
 - Planning Packages are usually less than 1 year and most often are tied to a Rolling Wave; the Rolling Waves are tied to significant project events
 - Methods selected to measure work accomplished against plan must be objective and meaningful based on Technical Performance Measures
 - Schedule tasks are derived from a product-based WBS
 - Schedule networks are created by linking lowest-level tasks only
 - Each schedule task has at least one predecessor and at least one successor (Exceptions: first and last task or external milestones)
 - Use of schedule lags/leads is minimal; a lag/lead may be injected into the schedule network only for a specific purpose, not as shortcut to identify logical sequences of events or to override event sequencing
 - Use of task constraints is minimal, usually only for key contractual milestones
 - Stakeholders validate Schedule, Scope, Task Logic, and Durations
 - Baseline is set, then an Integrated Baseline Review (IBR) is conducted
 - Management Reserve (MR) is based on risks in baseline risk register

- Accounting Considerations**
- WBS lowest elements are broken down into convenient “work packages” that are used to group, summarize/monitor elements of cost (e.g., labor, material)
 - Estimated actuals are used to ensure realistic actual costs in a timely manner

- Analysis and Management Reports**
- Reporting is at lowest WBS level necessary for effective management
 - LOE is extracted when evaluating actual progress and performance
 - Cost, Schedule, Technical along with risks and opportunities are tracked
 - Variances are analyzed; they are neither good nor bad but are variations indicating potential need for management action
 - EAC analysis is based on time/cost estimates adjusted for risks/opportunity
 - Project MR “burn down” rates with assumptions regarding potential distribution
 - Network critical path (plus some float) focus of schedule/PSI analysis
 - Track schedule metrics to access goodness of schedules, include start/finish slips, task near critical path, float/slack, etc.
 - Pessimistic/Most Likely/Optimistic estimates are made for costs and time

- Revisions and Data Maintenance**
- CCB approval is required for changes to scope, schedule, or budget
 - Develop realistic CA EACs integrated with technical, cost, and schedule risks/opportunities
 - Cost, Schedule, Technical along with risks and opportunities are tracked