Earned Value Management and the Government Program Office

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Agenda

- EVM Information
- Alignment – OMB Exhibit 300 and Funding
  - Government Program Office Challenges
  - Government Program Office Support Team
- A Word on IBRs
- A Word on Progress Reporting
- Graphically Rendering “Efficiency”
  - What it Means to the Customer

Not a Comprehensive EV, EVM, EVMS Presentation
EVM Information
What is Earned Value?

**Earned Value (EV)**
- method for translating Scope, Schedule and Budget into quantifiable measurement of a program’s progress
- [It is] what you physically got for what you actually spent
- the efficiency of the work accomplished
- the measured performance

**Earned Value Management (EVM)**
- oversight and coordination necessary to implement, maintain an EVMS, and report out EV

**Earned Value Management System (EVMS)**
- integration of tools and processes that satisfy the American National Standards Institute/Electronic Industry Alliance (ANSI/EIA) 32 criteria
- these criteria outline the minimum management control guidelines for an EVMS

**Earned Value Management**
- also referred to as Performance-Based Management

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Although it has Evolved Over the Last Several Decades, EVM is not a New Concept.
Who Uses Earned Value?

The Program Manager (PM) is responsible for implementing EVM

- During solicitation, the PM collaborates with the Contracting Officer (CO), and using the agency/program EVM guide, ensures the appropriate clauses are included in the solicitation and contract
- Upon contract award, the PM assesses contractor’s proposed EVMS and is authority for evaluating and approving EV-related deliverables

The Contracting Officer (CO) is responsible for coordinating EVM requirements with the PM

- Coordinates prior to contract award and final agreement with contractor on system/processes that will be used to track and report performance
- Ensures EV-related language is incorporated into the contract
- Complexity of the reporting process imposed should be based on the parameters (cost, schedule and technical risk) identified in agency/program EVM Guide and contractor’s existing reporting system
Why Use Earned Value Management?

**Government PM**
- **Responsibility is** to protect the Government’s interests by monitoring and managing contract performance

**Prime Contractor**
- **Responsibility is** to provide the Government actionable information regarding contract performance

**Earned Value Management**
- Supports these responsibilities by:
  - Ensuring a clear definition of program scope
  - Providing an objective measure of contractor accomplishment
  - Ensuring the government has accurate, objective, and real time contract status
  - Supporting risk based analysis by early identification of trends and potential risks
  - Supporting the mutual goals of contractor and government by bringing in programs on schedule and within cost
What Guidance Influences Earned Value?

- **OMB Circular A-11**
  - OMB mandate that federal agencies implement performance measures and performance management processes based on EVM guiding principles. These processes are required not only for the government, but also required of its contractors (June 2003)

- **ANSI/EIA 748B Standard for Earned Value Management Systems**
  - Industry re-write of the original 35 Cost/Schedule Control Systems Criteria (C/SCSC) (July 1998)

- **FAR EVM Clause 34.202(a)**
  - Provides EV requirements and must be included in contracts, as applicable

- **AMS EVM Clause 1.13-2**
  - Provides EV requirements and must be included in contracts, as applicable

- **Department and Agency-specific EVMS Management Directives**

- **PMI PMBOK – Naturally!**
Data Requirements – Applicable DIDs

DID DI-MGMT-81466A

• Contract Performance Report (CPR) (Data Item Description (DID) number DID DI-MGMT-81466A)

DID number DI-MGMT-81650

• Integrated Master Schedule (IMS) (DID number DI-MGMT-81650) are required whenever EVM is required (contracts equal to or greater than $20M)

DID number DI-MGMT-81334B

• Product-oriented Contract Work Breakdown Structure (CWBS) in accordance with the DoD WBS Handbook (MIL-HDBK-881A) and the CWBS DID (DID number DI-MGMT-81334B)

DID number DI-MGMT-81468

• Contract Funds Status Report (CFSR) (DID number DI-MGMT-81468) is required. No specific dollar thresholds are established for the CFSR, but application to contracts of less than $1.5M should be carefully evaluated.

For Data Item Descriptions (DIDs), Please Refer to www.acq.osd.mil/pm/
EVM Heuristics

Earned Value Management System (EVMS) in compliance with ANSI/EIA-748B is required on all cost or incentive contracts equal to or greater than $20M.

A formally validated and accepted EVMS is required for cost or incentive contracts equal to or greater than $50M.

EVM is discouraged for Firm-Fixed Price (FFP) contracts. Exception requires business case and Milestone Decision Authority waiver.

EVM may be imposed on contracts less than $20M as a risk-based decision of the program manager based on a cost/benefit analysis.
EVM and DCMA

Defense Contract Management Agency (DCMA)

• Memorandum of Agreement (MOA) with DHS for EVM Services

DCMA offers the following services on a reimbursable basis

• Initial EVMS compliance reviews and acceptance determinations
• Surveillance reviews of ongoing compliance with the EVMS ANSI standard
• Review for cause evaluations
• Subject Matter Expertise

DCMA IBR Tripwires

• DCMA has worked closely with the Office of the Under Secretary of Defense, Acquisition and Technology OUSD (A&T) to develop EVM primary and secondary “tripwires” and common performance metrics and thresholds that provide unbiased insights into program cost, schedule, and/or performance issues. These “tripwires” standardize Defense Acquisition Executive Summary (DAES) Reporting.
EVM and the PMBOK

Integration Management
- 4.1.1.4 – Account for Process Assets
- 4.5.1.3 – Earned Value Technique

Time Management
- 6.6.2.1 – Progress Reporting

Cost Management
- 7.0 – [EV Rules, Reporting Formats, and Process Descriptions]
- 7.2.2.2 – Reserve Analysis
- 7.3.2.2 – Performance Measurement Analysis [Formulas]

Communications Management
- 10.3.3 – Performance Reporting [Reports, Forecasts, Changes, Corrective Actions, Updates]

Risk Management
- 11.6.2.3 – Variance and Trend Analysis
# Earned Value Courses and Websites

<table>
<thead>
<tr>
<th>Course or Website</th>
<th>Description or Link</th>
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<tbody>
<tr>
<td>Project Management Institute</td>
<td><a href="http://www.pmi.org">www.pmi.org</a> [drill down for PMBOK]</td>
</tr>
<tr>
<td>ANSI/EIA-748B</td>
<td><a href="http://www.ansi.org">www.ansi.org</a> [drill down to online store]</td>
</tr>
<tr>
<td>Defense Contract Management Agency</td>
<td><a href="http://www.dcma.mil">www.dcma.mil</a> [drill down for “tripwires”]</td>
</tr>
<tr>
<td>DoD EV Website</td>
<td><a href="http://www.acq.osd.mil/pm">www.acq.osd.mil/pm</a> [explore!]</td>
</tr>
<tr>
<td>NDIA Website</td>
<td><a href="http://www.ndia.org">www.ndia.org</a> [explore!]</td>
</tr>
<tr>
<td>BCF 102 (on-line), Fundamentals of EV</td>
<td><a href="http://www.dau.mil">www.dau.mil</a> [drill down to specific course]</td>
</tr>
<tr>
<td>BCF 203, Intermediate EV</td>
<td><a href="http://www.dau.mil">www.dau.mil</a> [drill down to specific course]</td>
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<tr>
<td>CLM 013, Work Breakdown Structure</td>
<td><a href="http://www.dau.mil">www.dau.mil</a> [drill down to specific course]</td>
</tr>
<tr>
<td>Contract Performance Report (CPR)</td>
<td><a href="http://www.acq.osd.mil/pm">www.acq.osd.mil/pm</a> [scroll down for link]</td>
</tr>
<tr>
<td>Integrated Master Schedule (IMS)</td>
<td><a href="http://www.acq.osd.mil/pm">www.acq.osd.mil/pm</a> [scroll down for link]</td>
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<td>Product-oriented Contract Work Breakdown Structure (CWBS)</td>
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Alignment
OMB Exhibit 300 and Funding
For OMB Exhibit 300 Information, Please Refer to
www.whitehouse.gov/omb/circulars/a11/current_year/a11_toc.html
Alignment – OMB Exhibit 300 and Funding

**DME (Development, Modernization, Enhancement)**
- “Earned Value”
  - Cost
  - Schedule

**O&M (Operations and Maintenance)**
- Operational Analysis
  - Annual Estimates
  - Annual Assessments

Government PO has Unique Challenges Not Shared With the Prime Contractor
The Program Office and the PMB

Program (Office)

Customer WBS

Contract A (and its WBS)

Contract B (and its WBS)

Profit/Fee

Total Allocated Budget

Management Reserve

Performance Measurement Baseline (PMB)

Undistributed Budget

Distributed Budget

Summary Planning Packages

Control Account

Planning Packages

Work Packages

EV Focus is on the Performance Measurement Baseline On Down
Annual Cycles

Dec. 2008
- FY11 CPIC Process Begins
- Investment Selection/Definition

Jan. 2009
- RAP/Budget Planning
- Targets Issued

May 2009
- RAD Draft

Aug. 2009
- X300 Submitted

Sep. 2009
- RAD Final

Alignment

- Define
  - Define

- Your:
  - Scope
  - Schedule
  - Budget

- Anticipate Phase Transitions
  - DME to O&M to Mixed L/C

Program Office Support Varies, but is Consistent Throughout the Year
Add Value by Engaging with the Contractor Early and Often
A Word on IBRs
(Conducting the Integrated Baseline Review)
An Integrated Baseline Review (IBR) should be conducted by the PM and CO within three months of contract award.

The purpose of an IBR is to:
- Ensure the baseline captures entire technical scope of work
- Make certain the baseline is consistent with the contract schedule requirements
- Validate the right mix and level of resources are applied to the program

During the IBR, the government reviews the contractor’s:
- WBS
- IMS/IMP
- CA/CAP
- RAM

At IBR conclusion, the Government briefs contractor on:
- Findings
- Recommendations
- Action Items
- Provides PMB Assessment

DCMA Tripwires
- Primary – System Compliance
- Secondary – Baseline Execution and Indices

Through the IBR, the Government Verifies and Validates the PMB.
Notional IBR Timeline

**Pre-IBR**

- TO Award
- IBR -45
- IBR Fam.
- IBR -35
- IBR Gov.
- IBR -35
- WBS Training
- IBR - 30
- Schedule Training
- IBR -25
- EVMS Training
- IBR -20
- IBR Letter
- IBR -15
- Materials Prep
- IBR -12
- IBR -10
- 10 Day Review
- IBR -5
- 5 Day Review
- IBR

**IBR Day One**

- IBR Kick-off
- PMCS Review
- TO Overview
- Lunch
- 1st Interview Cycle
- GO Review
- 1st Day Out-brief

**IBR Day Two**

- IBR 2nd Day Kickoff
- 2nd Interview Cycle
- GO Review
- Lunch
- 3rd Interview Cycle
- GO Review
- IBR Out-Brief

**IBR**
A Word on Progress Reporting
(Reading the CPR, Conducting the CPR)
Contract Performance Reporting

**Contract Performance Reports (CPRs)**
- most comprehensive and detailed of standardized Earned Value reporting

**CPRs provide**
- contract status and are contractually required by the Department

**The data analyzed**
- derived from the contractor’s approved Earned Value Management System

**The Contract Performance Report (CPR)**
- contractor-generated report that provides program/contract status

Get CPR Early, Review Data Rigorously, Brief Government POC Immediately
Contract Performance Report Reviews

**Contract Performance Report Reviews, or CPR Reviews, Are**

Standard, generally monthly, meetings at which program performance is reviewed.

**Information Reviewed**

- Program Performance
- Risk
- Estimate at Completion
- Variances and their explanations
- Scope

**Participants Generally Are**

- Government PM
- Contractor PM
- CAMs
- EV Subject Matter Experts
- Relevant Stakeholders

Incorporate CPR Reviews into Comprehensive Program Management Reviews
## The Contract Performance Report

| Format 1: WBS View | • Identifies both current and cumulative variances  
|                    | • Information usually reported at WBS level 3 or 4 (lower if known risk area) |
| Format 2: OBS View | • Organized by organizational element  
|                    | • Contractor may use this report to evaluate departmental performance |
| Format 3: Baseline View | • Details all changes to the Performance Management Baseline on a monthly basis |
| Format 4: Staffing View | • Focuses on current and future staffing levels and requirements; excludes cost data |
| Format 5: Variances View | • Narrative summary of problems (from all other formats) that includes reason for variance, problem impact, and recovery plan |

Formats 1 and 5 are Popular; Why Is Format 4 Worth a Look?
### The CPR Formats

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td><strong>Headers Largely The Same</strong></td>
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<td><strong>Bodies Contain Unique Data</strong></td>
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</table>
Graphically Rendering “Efficiency”
## Terminology Summary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>Actual Cost (ACWP): Costs incurred and recorded in accomplishing work performed within a given time period.</td>
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<tr>
<td>BAC</td>
<td>Budget at Complete: The sum of all budgets established for the contract.</td>
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</tr>
<tr>
<td>CPI</td>
<td>Cost Performance Index: The dollar value of work accomplished for each dollar spent.</td>
<td>EV/AC</td>
</tr>
<tr>
<td>CV</td>
<td>Cost Variance: Indicates how much over or under budget the project is.</td>
<td>EV – AC</td>
</tr>
<tr>
<td>EAC</td>
<td>Estimate at Complete: Actual direct costs, plus indirect costs allocable to the contract, plus the estimate of costs (direct and indirect) for authorized work remaining.</td>
<td></td>
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<tr>
<td>ETC</td>
<td>Estimate to Complete: Portion of EAC that addresses total expected costs for all work remaining on the contract.</td>
<td></td>
</tr>
<tr>
<td>EV</td>
<td>Earned Value (BCWP): The sum of the budgets for completed work packages and completed portions of open work packages, plus the applicable portion of the budgets for level of effort and apportioned effort.</td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>Planned Value (BCWS): The sum of the budgets for all work packages, planning packages, etc., scheduled to be accomplished (including in-process work packages), plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period.</td>
<td></td>
</tr>
<tr>
<td>SPI</td>
<td>Schedule Performance Index: The dollar value of work accomplished for each dollar of work planned</td>
<td>EV/PV</td>
</tr>
<tr>
<td>SV</td>
<td>Schedule Variance: Indicates how much ahead or behind schedule the project is.</td>
<td>EV – PV</td>
</tr>
<tr>
<td>TCPI</td>
<td>To Complete Performance Index: The cost efficiency that must be achieved in remaining period of performance to complete the total work scope within the BAC target.</td>
<td></td>
</tr>
<tr>
<td>VAC</td>
<td>Variance at Complete: Difference between total budget assigned to a contract, WBS element, Organizational entity or cost account and the estimate at completion. It represents the amount of expected overrun or underrun.</td>
<td>BAC – EAC</td>
</tr>
</tbody>
</table>

For a Complete List, go to [www.acq.osd.mil/pm/faqs/glossary.htm](http://www.acq.osd.mil/pm/faqs/glossary.htm)
## Estimate at Completion (EAC)

Codify the EACs you will use for Best, Worst, and Most Likely Outcomes

<table>
<thead>
<tr>
<th>Method</th>
<th>CPI-based</th>
<th>Mathematical</th>
<th>Cumulative EAC</th>
<th>EV-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula</td>
<td>BAC/CPI</td>
<td>ACWP + BAC – BCWP</td>
<td>[(BAC - BCWP)/(SPI * CPI)] + ACWP</td>
<td>ACWP + (BAC – BCWP)/CPI</td>
</tr>
<tr>
<td>Interpretation</td>
<td>Used if no variances from the BAC have occurred or you will continue at the same rate of spending.</td>
<td>Used when current variances are thought to be atypical of the future.</td>
<td>Used when considering both cost and schedule impacts on EAC</td>
<td>Used when current variances are thought to be typical of the future.</td>
</tr>
</tbody>
</table>

Early and Careful Monitoring of EAC is Integral to Program Success
Understanding Cost and Schedule Variances

The Program Office Wants to Know

- “Will the contract finish on time?”
- “Will the contract require additional funding?”

Cost Variance (CV)

- EV – AC, or BCWP – ACWP

Schedule Variance

- EV – PV, or BCWP – BCWS
Understanding Cost and Schedule Variances

Cost Variance (CV)
Schedule Variance (SV)

PV (PMB)  EV  AC  BAC  EAC
Understanding Cost and Schedule Variance

SV = BCWP - BCWS $ (20) Behind Schedule
CV = BCWP - ACWP $ (9) Negative Cost Variance

SV = BCWP - BCWS $ 8 Ahead of Schedule
CV = BCWP - ACWP $ 19 Positive Cost Variance

SV = BCWP - BCWS $ 8 Ahead of Schedule
CV = BCWP - ACWP $ (6) Negative Cost Variance

SV = BCWP - BCWS $ (7) Behind Schedule
CV = BCWP - ACWP $ 6 Positive Cost Variance
Understanding Cost and Schedule Indices

The Program Office Wants to Know

• “How Efficiently is Contractor Executing Contract/TOs?”
• “What Must Change to improve efficiency?”

Cost Performance Index (CPI)

• EV/AC, or BCWP/ACWP

Schedule Performance Index (SPI)

• EV/PV, or BCWP/BCWS
Understanding Cost and Schedule Indices

Actuals Indicate Contract is Inefficient
Understanding Cost and Schedule Indices

Trend Lines Suggest this will Continue
Understanding Cost and Schedule Indices

Can Get Back on Track By Becoming More Efficient, or …
Understanding Cost and Schedule Indices

Can Get Back on Track By Infusing Cash (Rebaselining)
Focus has Been on the Role of the PMO in Supporting the Government Program Office
Questions?