
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

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 ¹

Earned Value Management (EVM)

- oversight and coordination necessary to implement, maintain an EVMS, and report out EV

Earned Value Management System (EVMS)

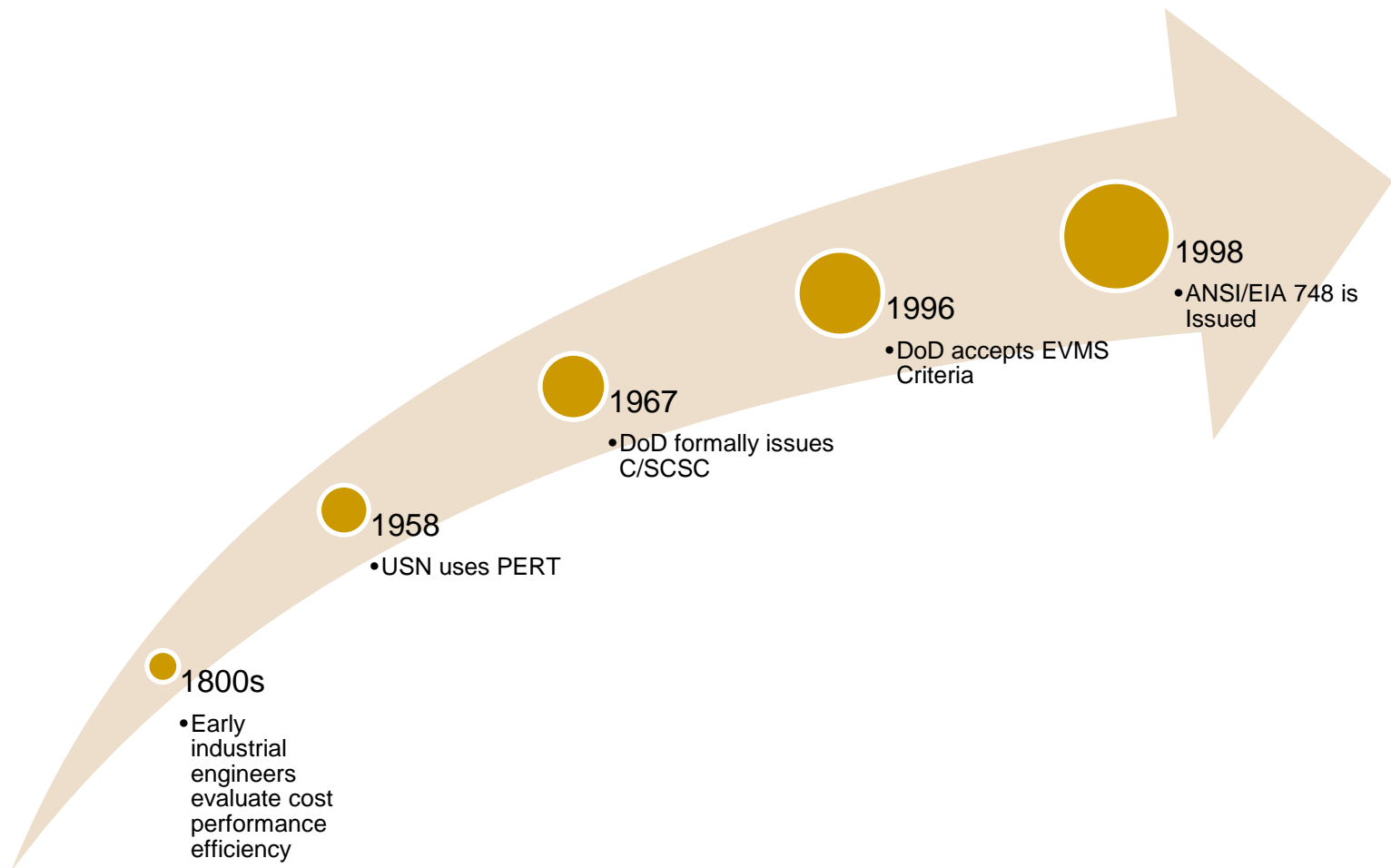
- integration of tools and processes that satisfy the American National Standards Institute/Electronic Industry Alliance (ANSI/EIA) 32 criteria
- these criteria outline the minimum management control guidelines for an EVMS

Earned Value Management

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

¹ Fleming, Koppelman, Earned Value Project Management, Second Edition, 2000

Evolution of Earned Value Management



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

Course or Website	Description or Link
Project Management Institute	www.pmi.org [drill down for PMBOK]
OMB Circular A-11	www.whitehouse.gov/omb/circulars/a11/current_year/a11_toc.html
ANSI/EIA-748B	www.ansi.org [drill down to online store]
Defense Contract Management Agency	www.dcmam.mil [drill down for “tripwires”]
DoD EV Website	www.acq.osd.mil/pm [explore!]
NDIA Website	www.ndia.org [explore!]
Mil Std 881A	Combatindex.com/mil_docs/std/0800/MIL-STD-88A.pdf
BCF 102 (on-line), Fundamentals of EV	www.dau.mil/ [drill down to specific course]
BCF 203, Intermediate EV	www.dau.mil/ [drill down to specific course]
CLM 013, Work Breakdown Structure	www.dau.mil/ [drill down to specific course]
Contract Performance Report (CPR)	www.acq.osd.mil/pm/ [scroll down for link]
Integrated Master Schedule (IMS)	www.acq.osd.mil/pm/ [scroll down for link]
Product-oriented Contract Work Breakdown Structure (CWBS)	www.acq.osd.mil/pm/ [scroll down for link]
Contract Funds Status Report (CFSR)	www.acq.osd.mil/pm/ [scroll down for link]

Alignment
OMB Exhibit 300 and Funding

OMB Exhibit 300 A-11, Part 7

Planning, Budgeting, Acquisition, and Management of Capital Assets

Part I – Summary Information and Justification

- Section A: Overview
- Section B: Spending
- Section C: Acquisition/Contract Strategy
- Section D: Performance Information
- Section E: Security and Privacy
- Section F: Enterprise Architecture

Part II – Planning, Acquisition, and Performance

- Section A: Alternatives Analysis
- Section B: Risk Management
- Section C: Cost and Schedule Performance

Part III – Operations and Maintenance

- Section A: Risk Management
- Section B: Cost and Schedule Performance

Part IV – Planning for Multi-agency Collaboration

- Section A: Multi-Agency Collaboration Oversight
- Section B: Risk Management
- Section C: Cost and Schedule Performance

**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

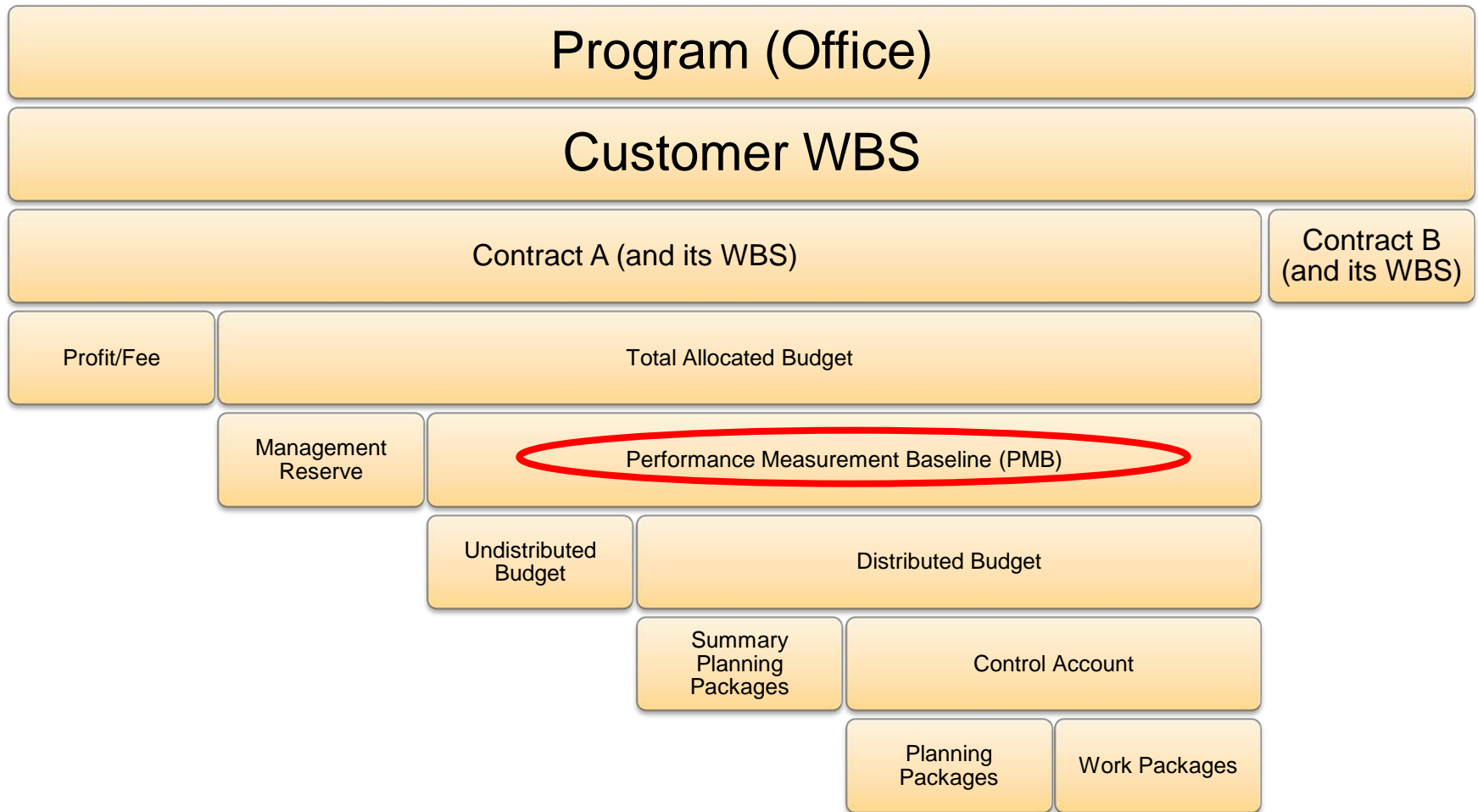
DME (Development,
Modernization,
Enhancement)

- **“Earned Value”**
 - Cost
 - Schedule

O&M (Operations
and Maintenance)

- **Operational Analysis**
 - Annual Estimates
 - Annual Assessments

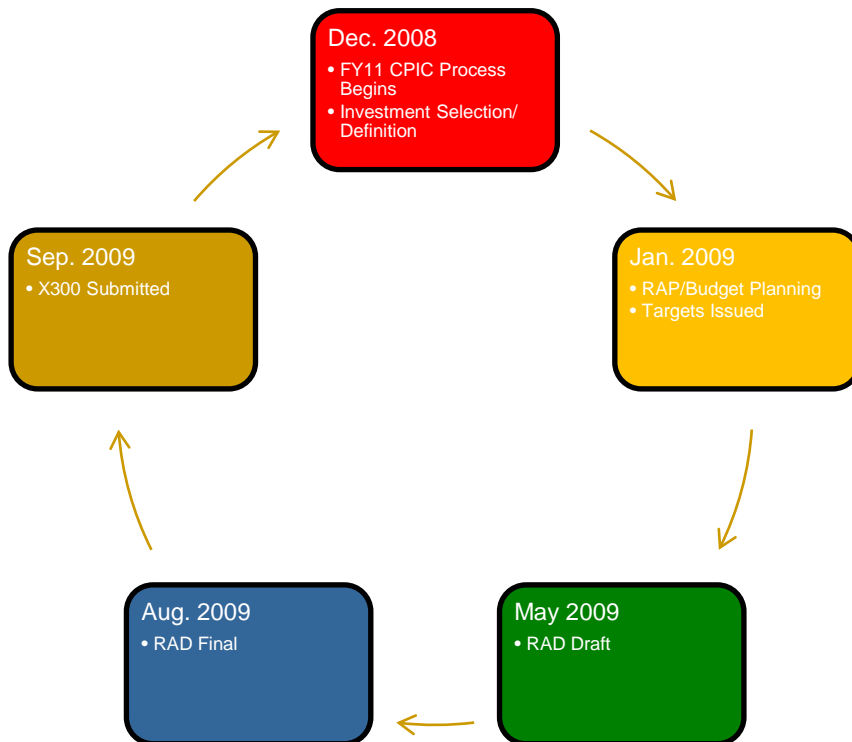
The Program Office and the PMB



EV Focus is on the Performance Measurement Baseline On Down

OMB Exhibit 300 Milestones and Decomposition

Annual Cycles

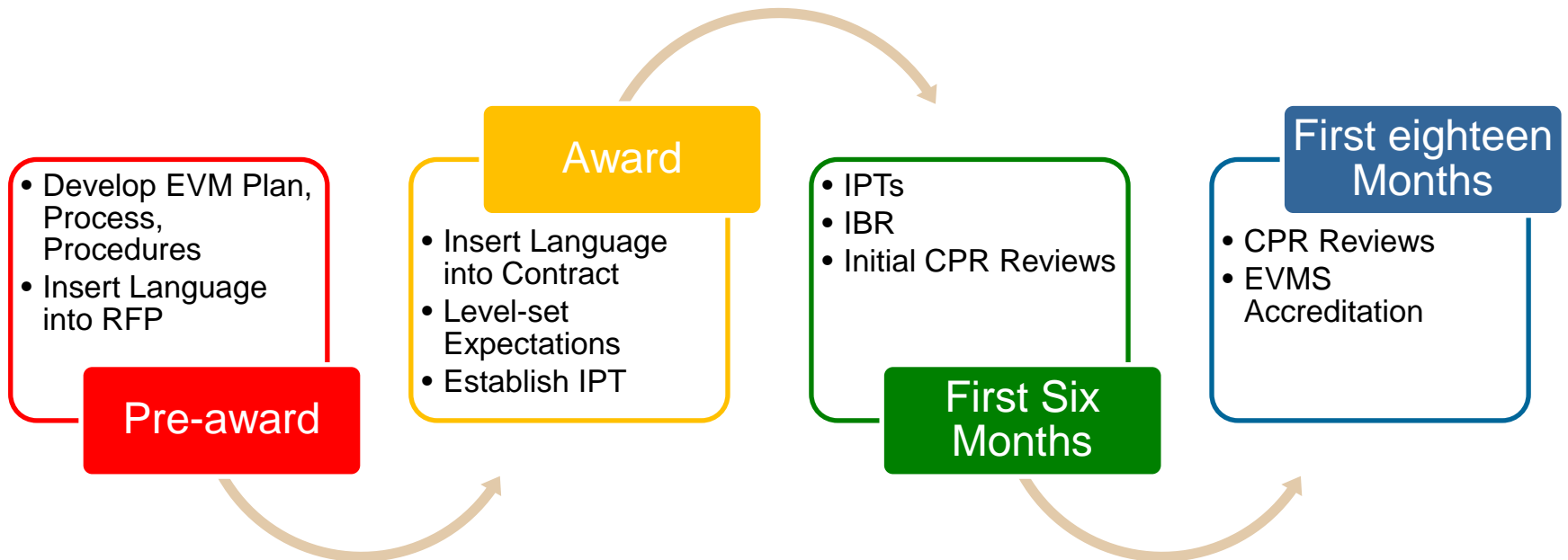


Alignment

- **Define**
 - 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

EVMS Milestones to Consider



Add Value by Engaging with the Contractor Early and Often

A Word on IBRs

(Conducting the Integrated Baseline Review)

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

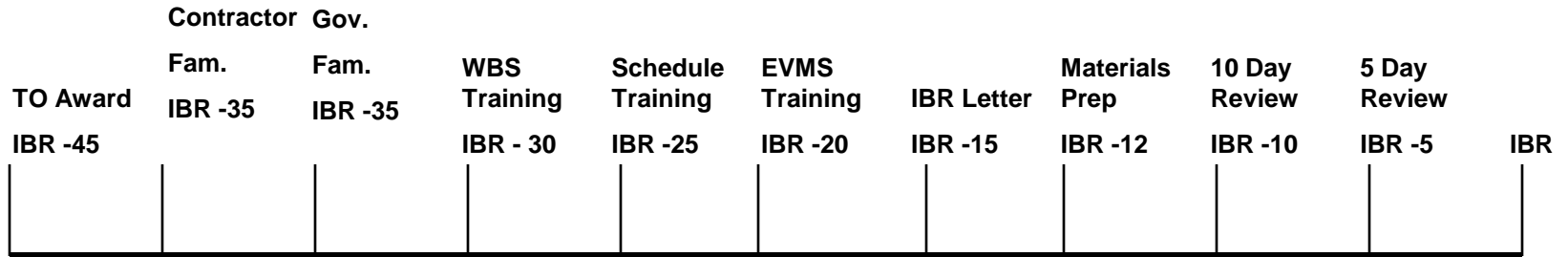
DCMA Tripwires

Primary – System Compliance

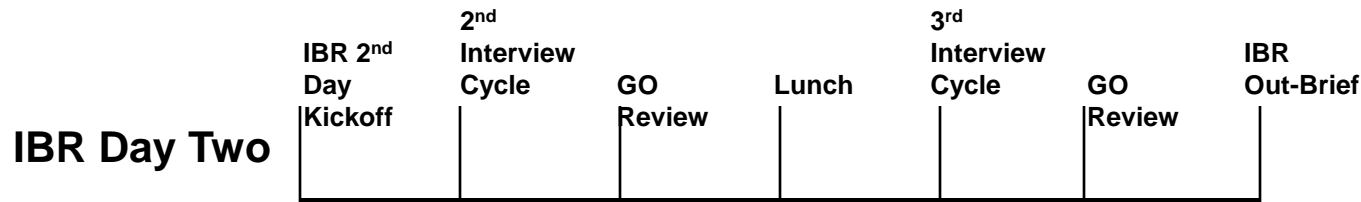
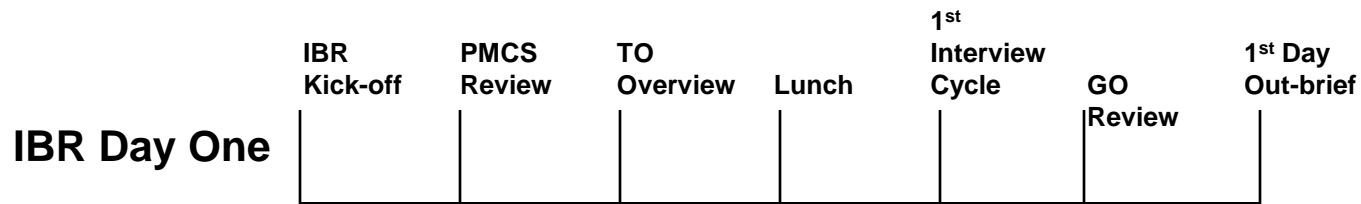
Secondary – Baseline Execution and Indices

Through the IBR, the Government Verifies and Validates the PMB

Notional IBR Timeline



Pre-IBR



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

Variations 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

Headers Largely The Same

1

2

3

4

5

Bodies Contain Unique Data

Graphically Rendering “Efficiency”

Terminology Summary

Term	Definition	Formula
AC	Actual Cost (ACWP): Costs incurred and recorded in accomplishing work performed within a given time period.	
BAC	Budget at Complete: The sum of all budgets established for the contract.	
CPI	Cost Performance Index: The dollar value of work accomplished for each dollar spent.	EV/AC
CV	Cost Variance: Indicates how much over or under budget the project is.	EV – AC
EAC	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.	
ETC	Estimate to Complete: Portion of EAC that addresses total expected costs for all work remaining on the contract.	
EV	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.	
PV	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.	
SPI	Schedule Performance Index: The dollar value of work accomplished for each dollar of work planned	EV/PV
SV	Schedule Variance: Indicates how much ahead or behind schedule the project is.	EV – PV
TCPI	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.	
VAC	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.	BAC – EAC

For a Complete List, go to 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

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

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?”

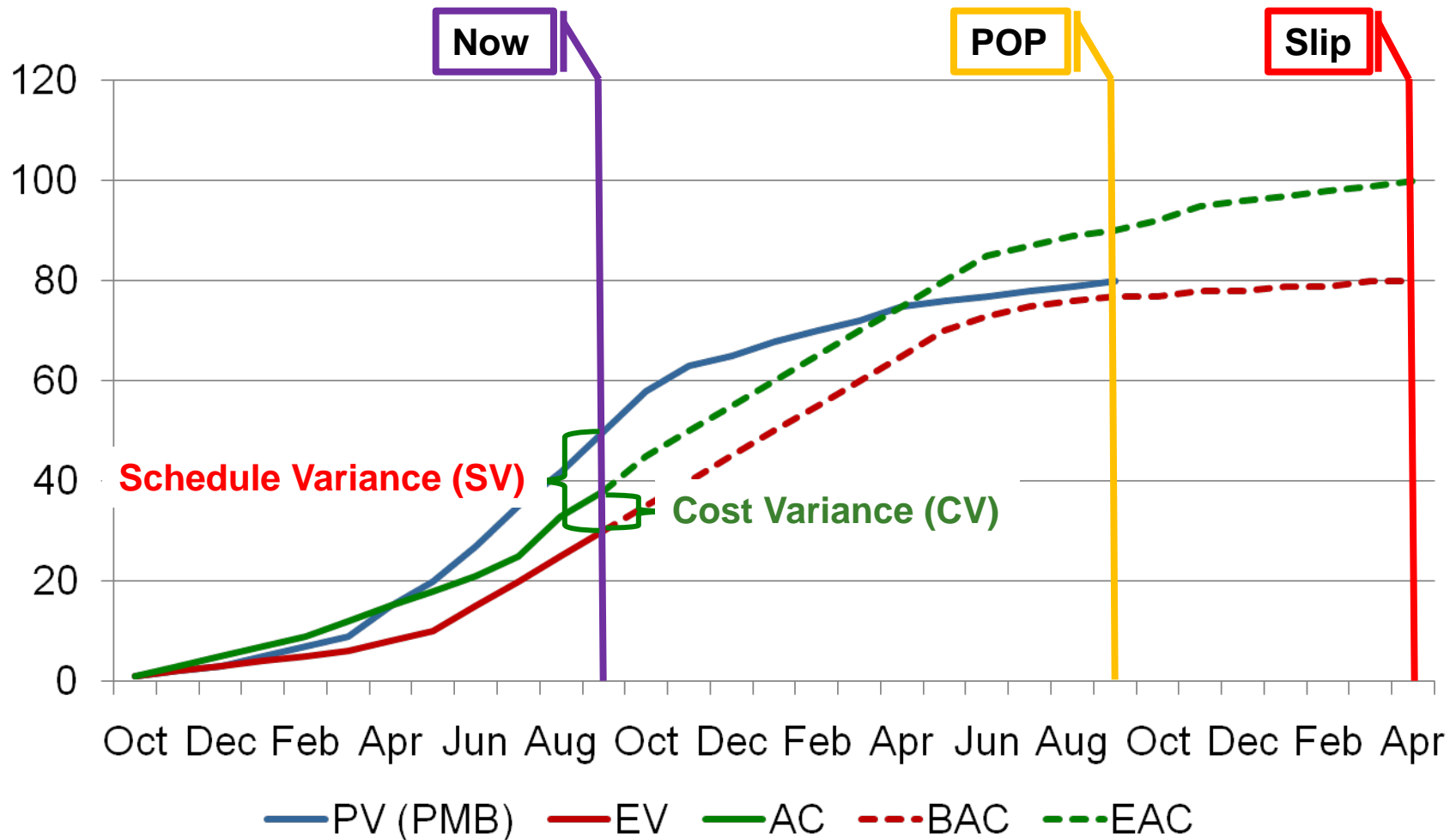
Cost Variance (CV)

- $EV - AC$, or $BCWP - ACWP$

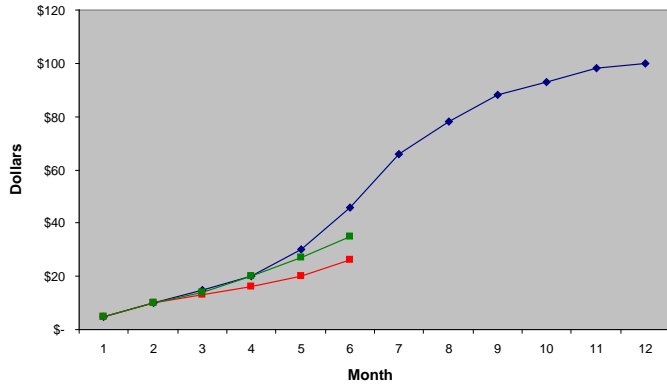
Schedule Variance

- $EV - PV$, or $BCWP - BCWS$

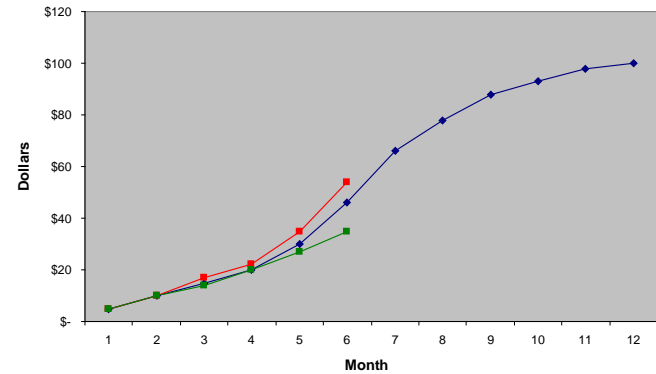
Understanding Cost and Schedule Variances



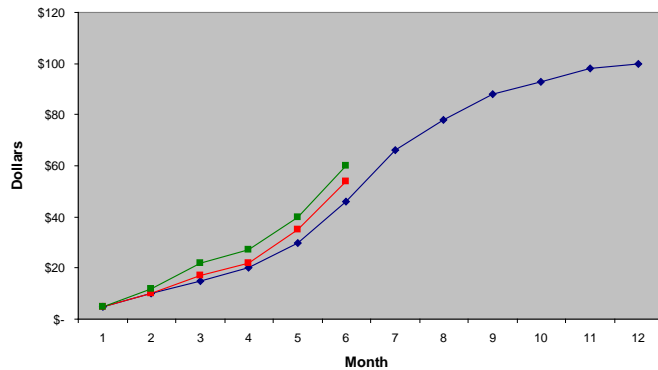
Understanding Cost and Schedule Variance



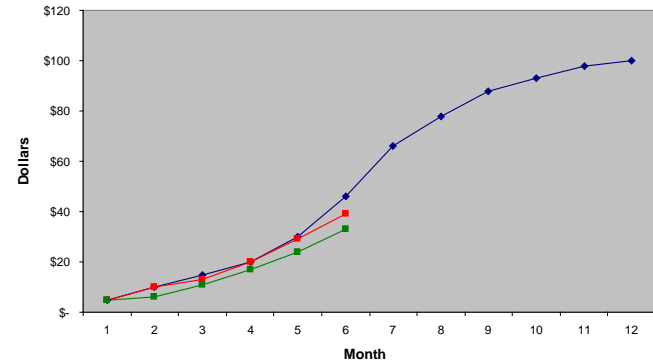
$SV = BCWP - BCWS$ \$ (20) Behind Schedule
 $CV = BCWP - ACWP$ \$ (9) Negative Cost Variance



$SV = BCWP - BCWS$ \$ 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?”

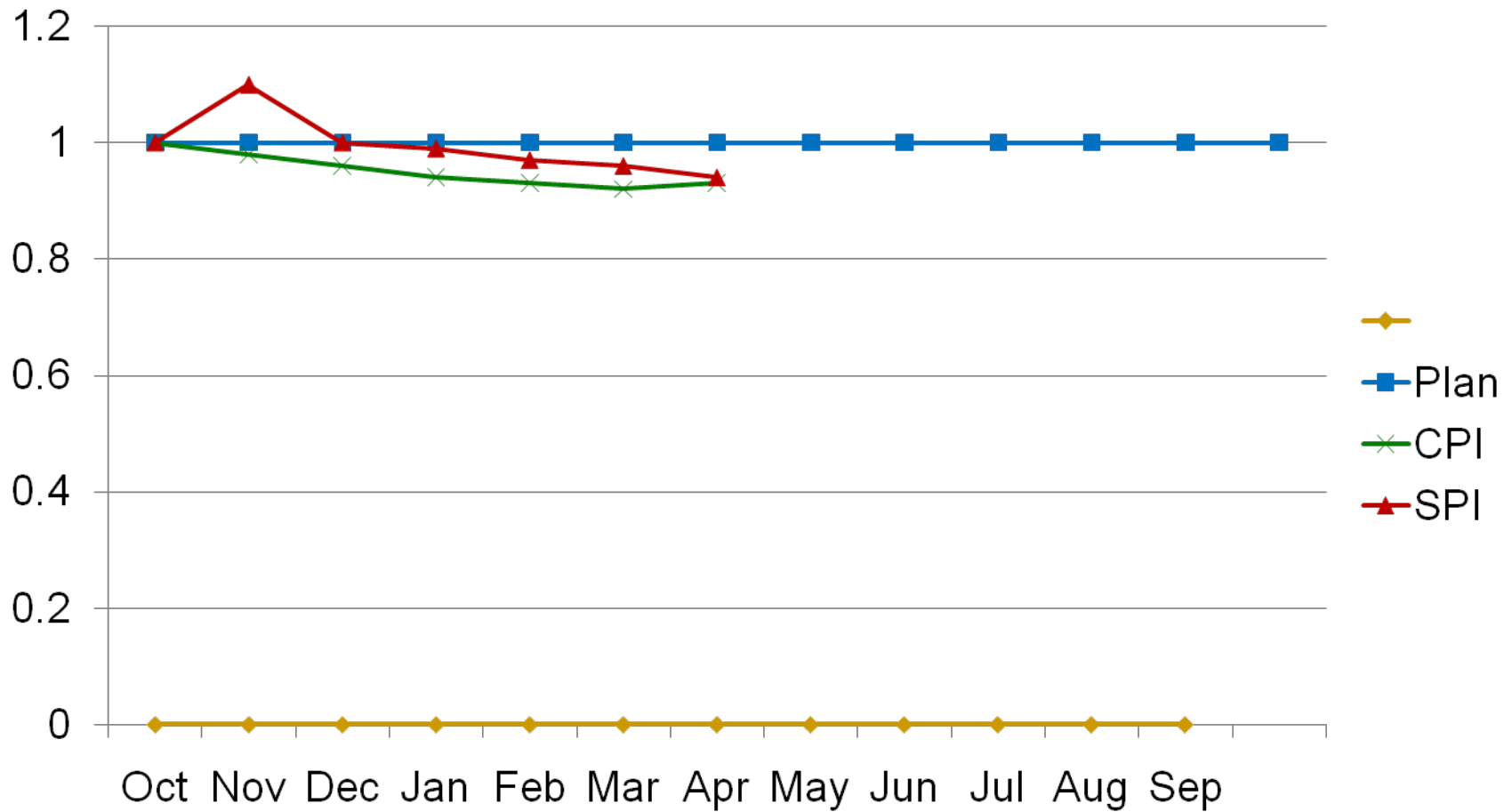
Cost Performance Index (CPI)

- EV/AC , or $BCWP/ACWP$

Schedule Performance Index (SPI)

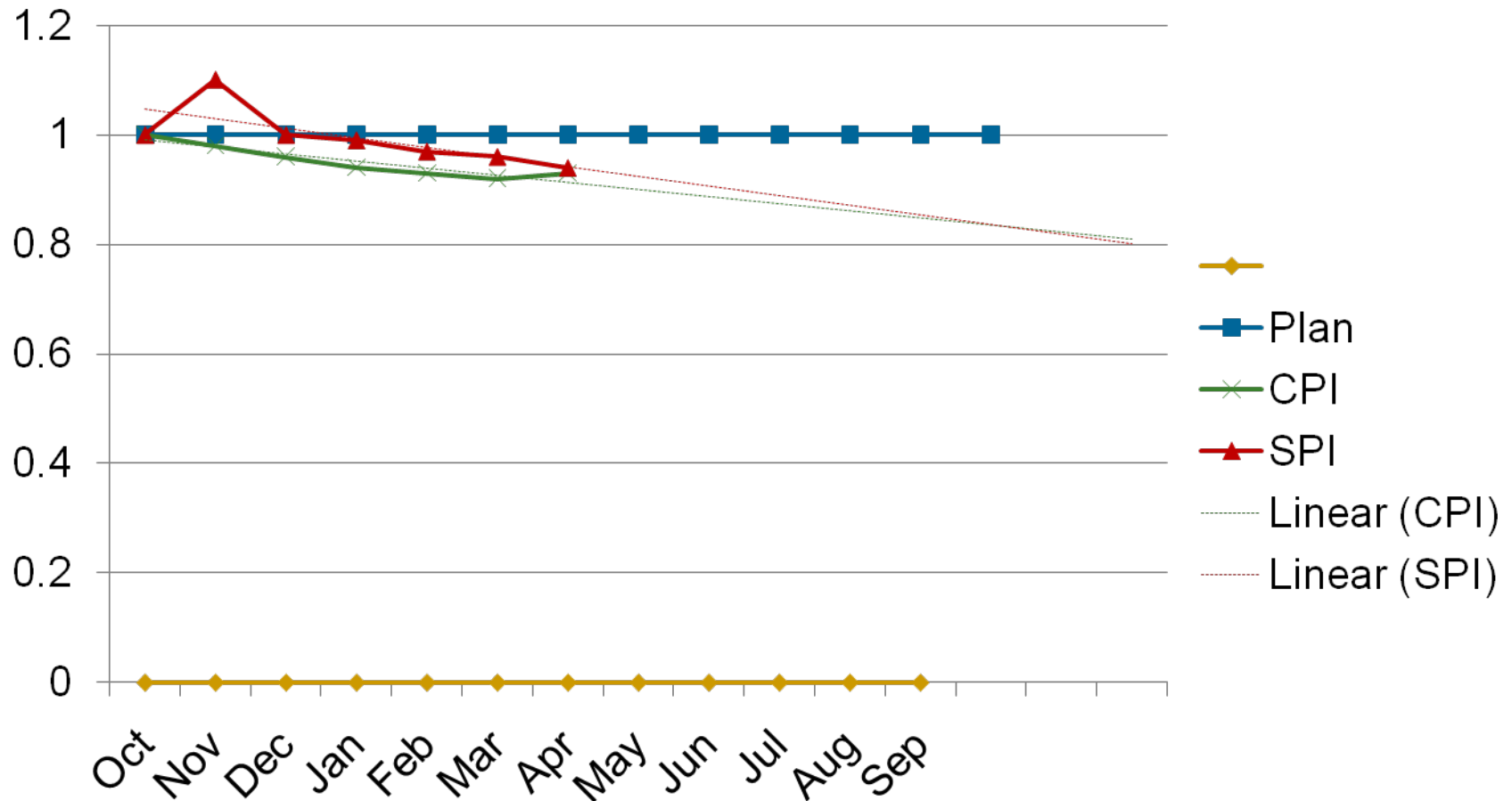
- EV/PV , or $BCWP/BCWS$

Understanding Cost and Schedule Indices



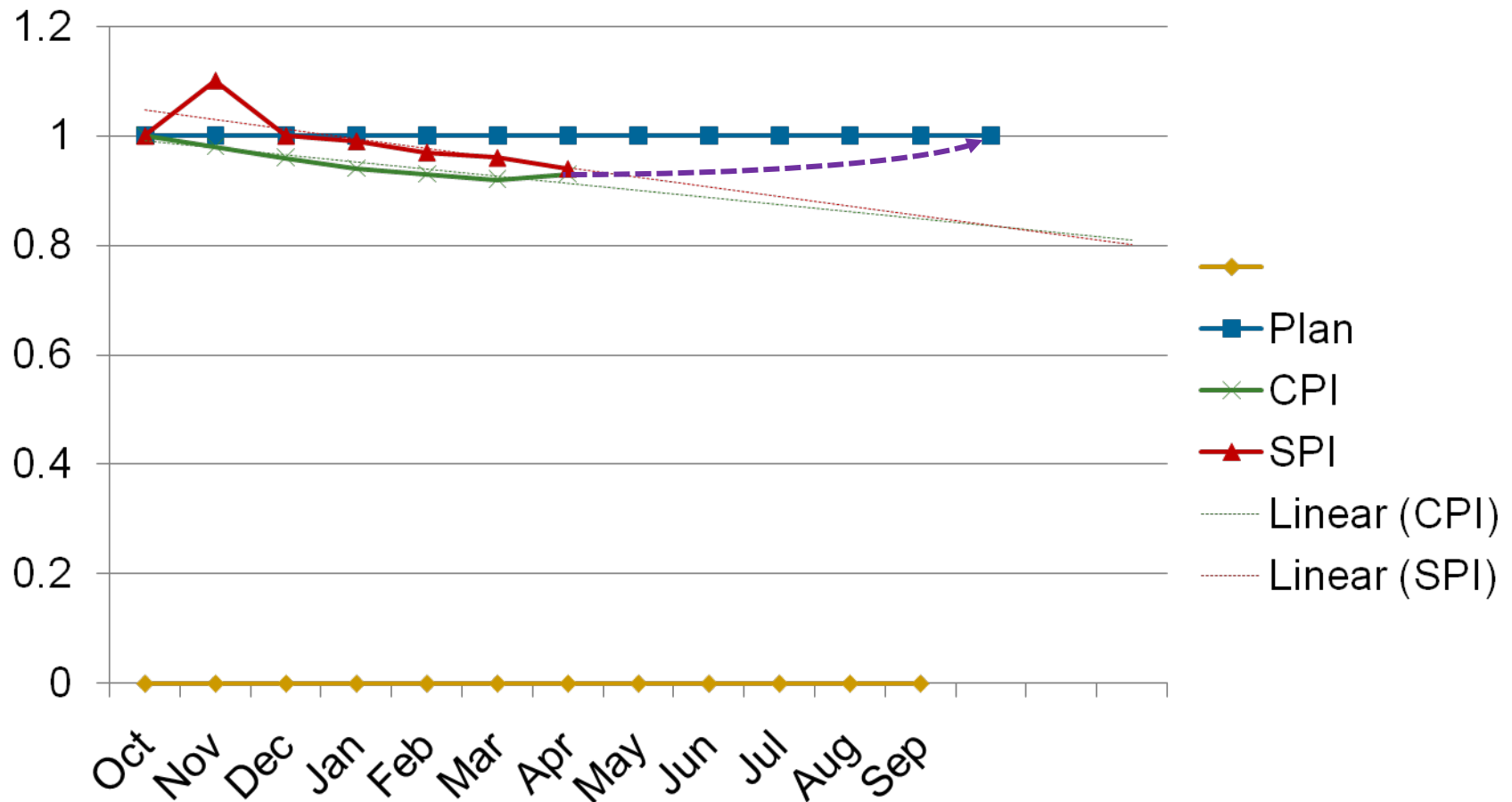
Actuals Indicate Contract is Inefficient

Understanding Cost and Schedule Indices



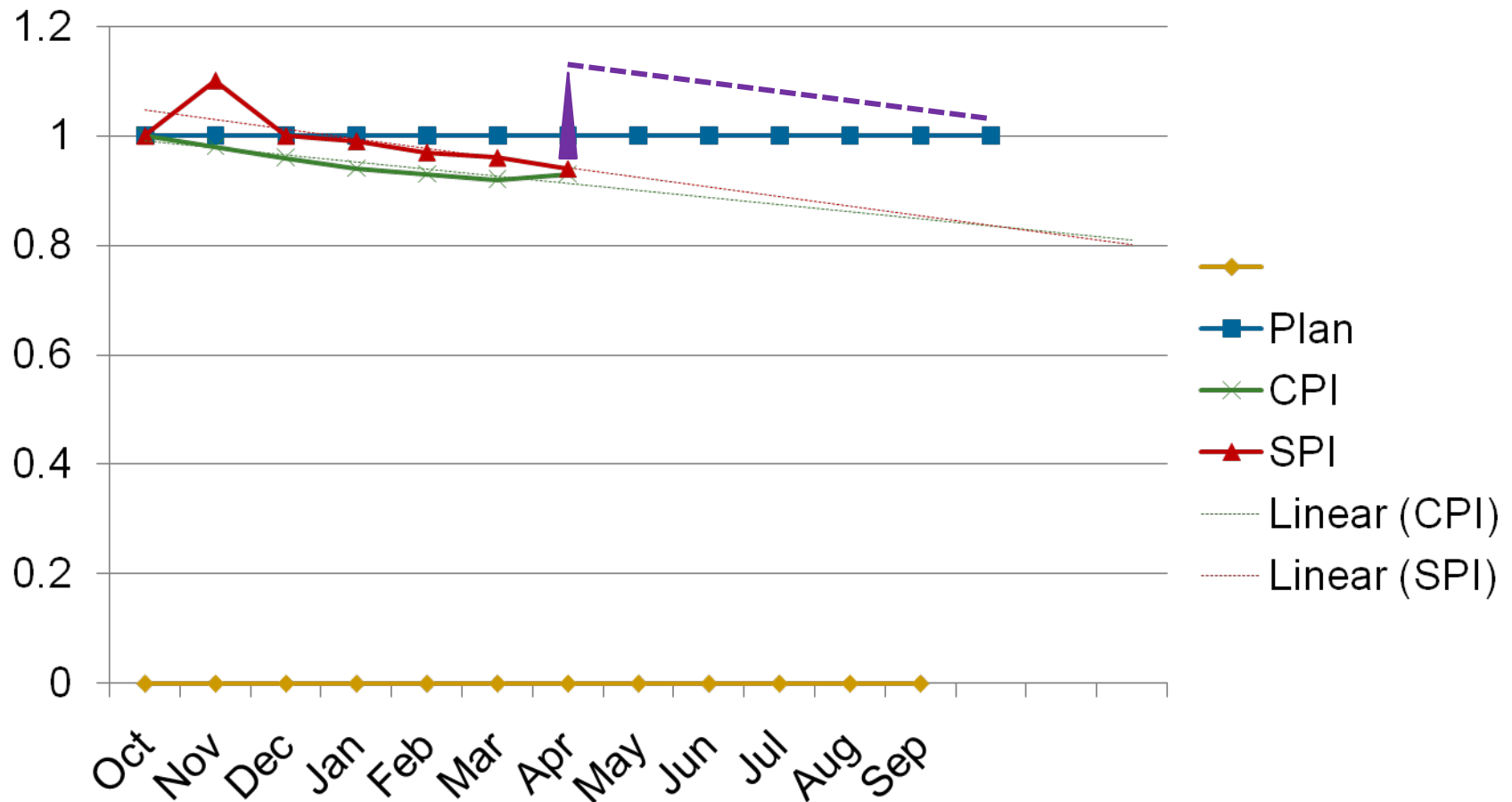
Trend Lines Suggest this will Continue

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)

Summary

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Questions?