

Cost Effective Implementation of Earned Value Management Systems (EVMS)

**The Federal Acquisition Conference and
Exposition**

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Cost Effective Implementation of EVMS

Agenda

- Introduction
- Cost effective EVM technique examples
 - Fixed Price Production
 - Fixed Price Non-Recurring
 - Apportioned EVM Method

Historically, the Earned Value Management approach to program management has been primarily applied to large, complex, programs conducted by DoD, NASA, and DoE.

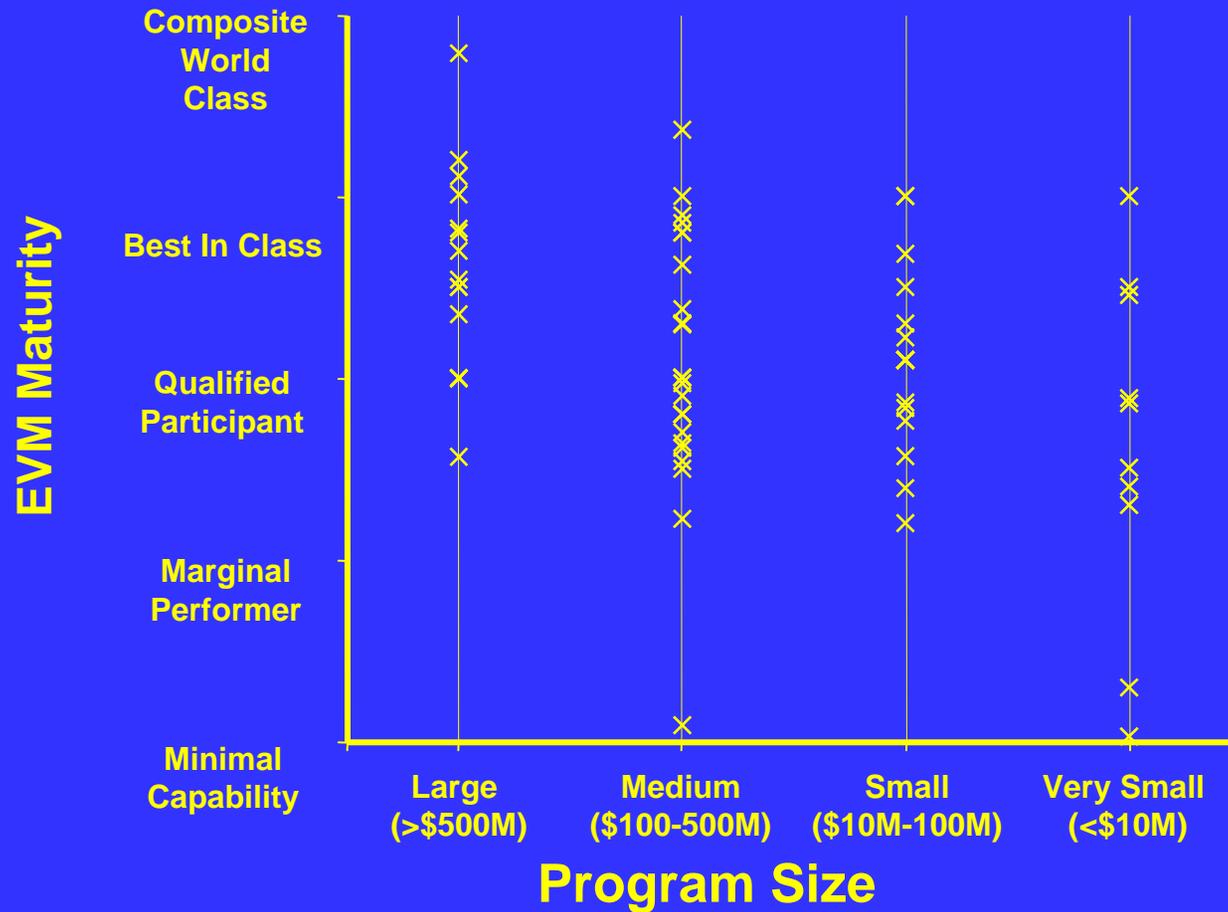
The Earned Value Management approach has been primarily applied to manage the work effort of the prime contractor and its major subcontractors, not the total Program effort.



EVMS developed in the past have developed a reputation for being costly and burdensome when compared to the requirements of small to middle sized programs.

Historically, EVM Increased Maturity Improvements Correlates with Program Size

82 programs across 7 companies were benchmarked



Source: EVM Benchmarking Data
 May 2000 CPM Conference, BAH & Lockheed Martin



Good News

The Earned Value Management Systems Standard (ANSI / EIA 748A) was designed to be scalable and flexible to address the management systems requirements of the Program's size complexity and relative risk. Additional guidance includes:

- *EVMS Intent Guide*
- *Surveillance Guide*
- *IBR Guide*

EVMS application spans all contract types, and performing organizations, so the Program Manager sees the total picture, rather than just focusing on managing a single contract.

The additional approach of implementing EVM techniques within the Government Program Office provide the Agency and Program Manager cost effective strategies to use EVM and improve program management.

Current EVMS implementations will adopt more cost effective strategies

Industry Best Practices

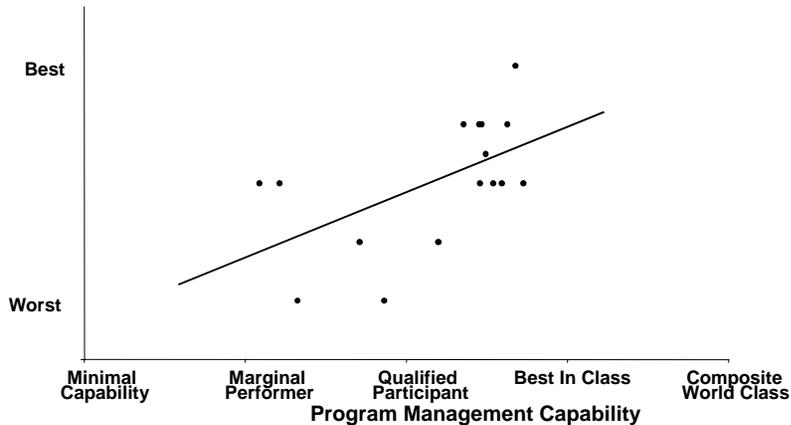


- 1967 – DoD - Cost/Schedule Control Systems Criteria
- 1996 – OMB Circular A-11, Part 3
- 1997 – DoD - Earned Value Management Systems Criteria
- 1998 – ANSI/EIA-748-98
- 2002 – OMB Circular A-11, Part 7
- 2002 – ANSI/EIA-748-A
- **2003 - OMB “Renewed Vigor”**
- **2005 - Revised FAR Clause**
- **2005 – Revised Agency Policies**

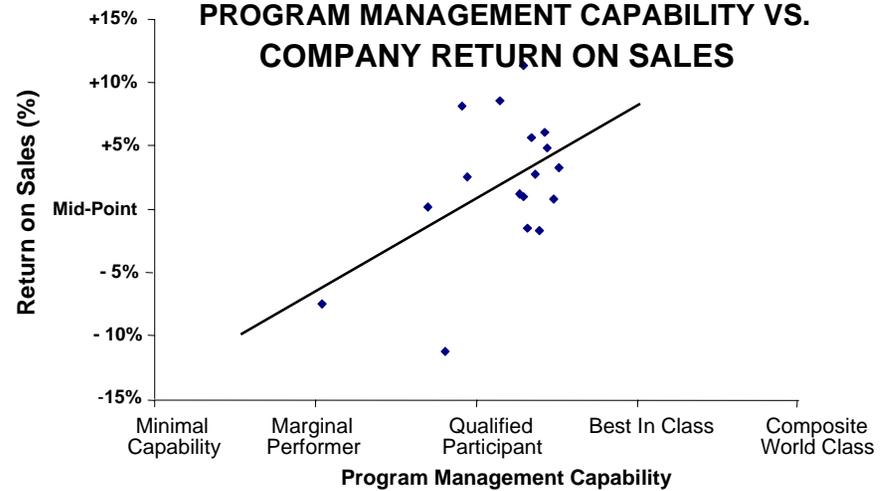
Government Requirements

There are still strong business reasons to adopt EVM

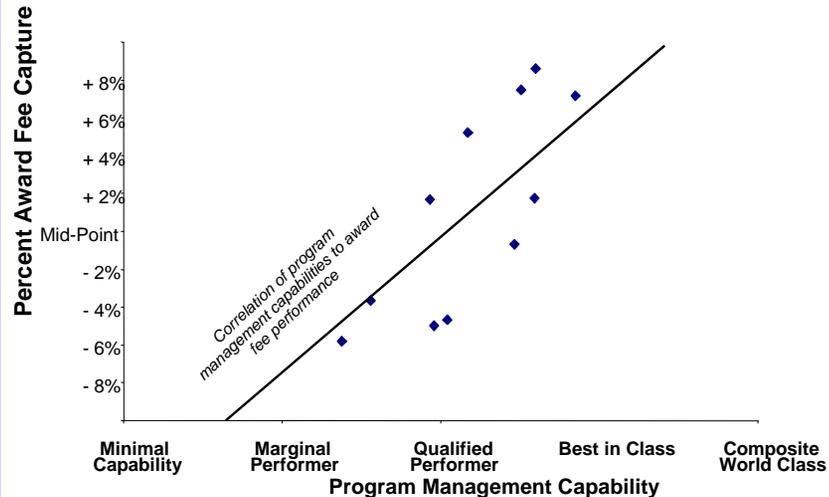
PROGRAM CPARS RATING



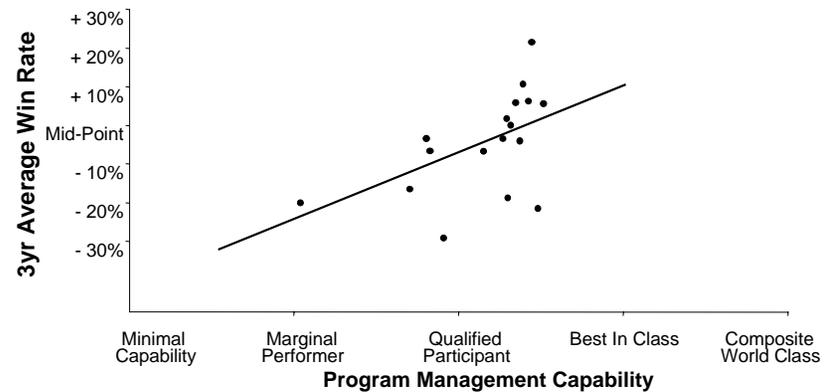
PROGRAM MANAGEMENT CAPABILITY VS. COMPANY RETURN ON SALES



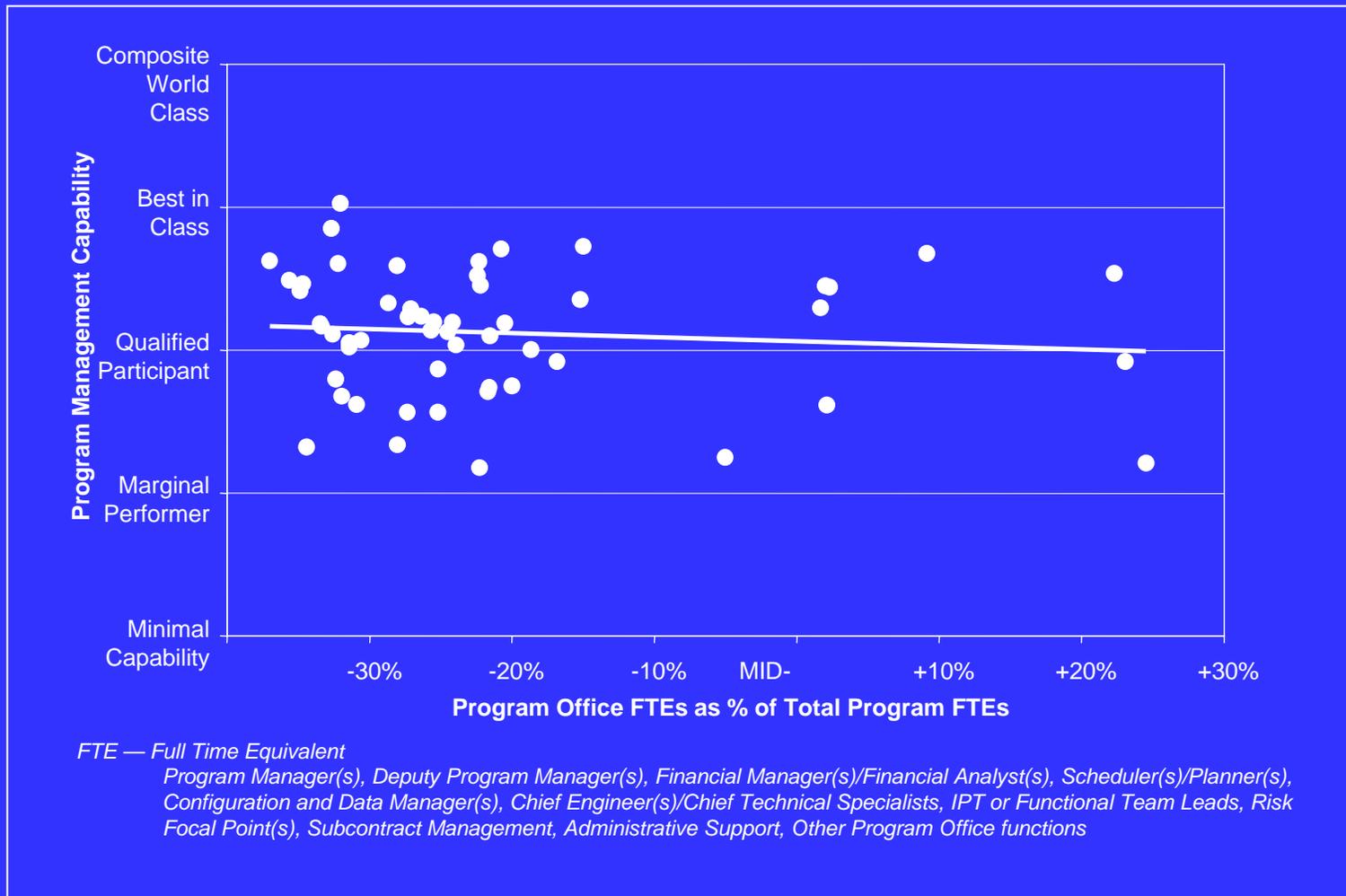
PROGRAM AWARD FEE CAPTURE



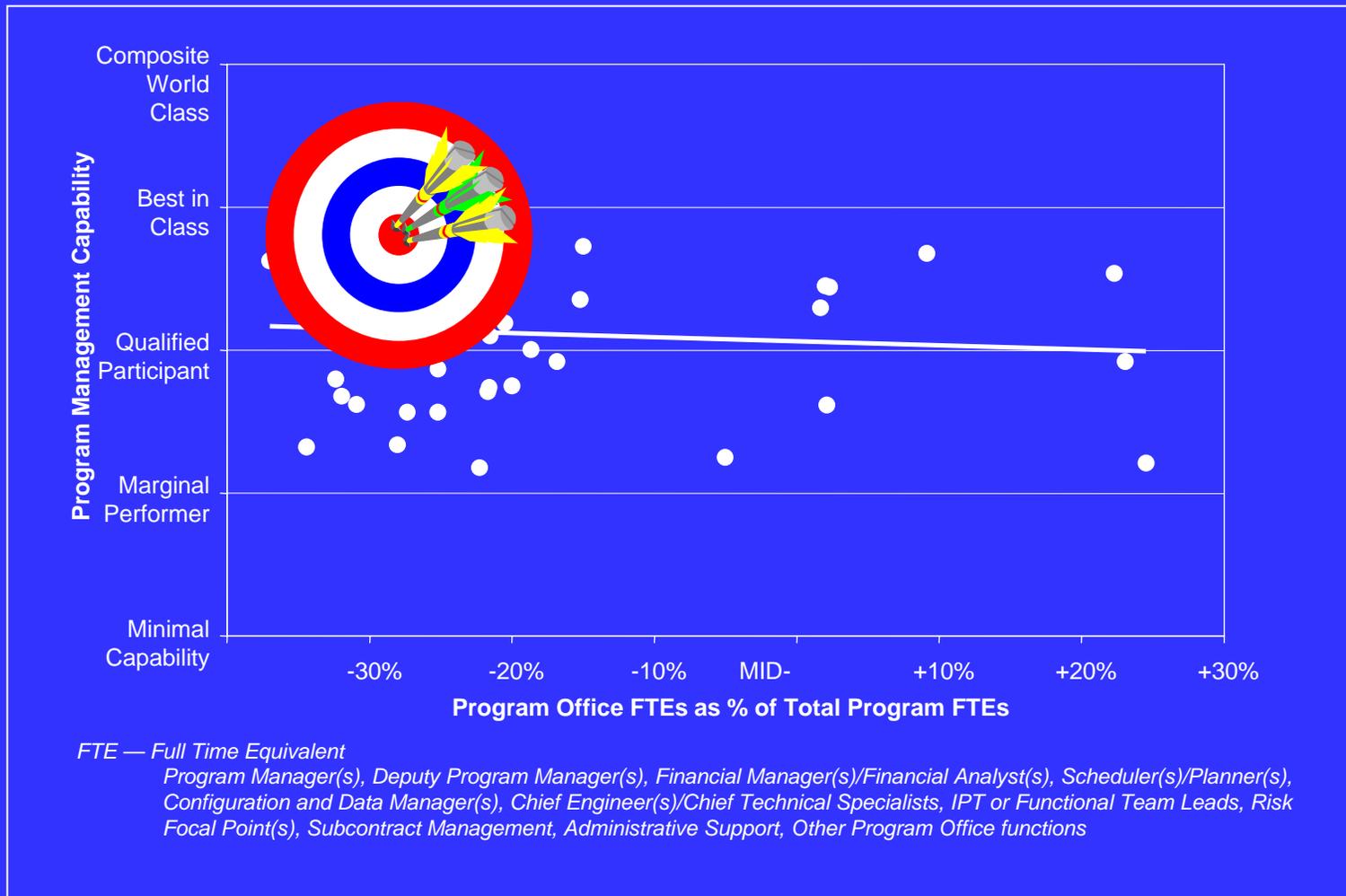
COMPANY WIN RATE VS. PROGRAM MANAGEMENT CAPABILITY



Improved cost and schedule control processes and practices do not have to increase PM costs

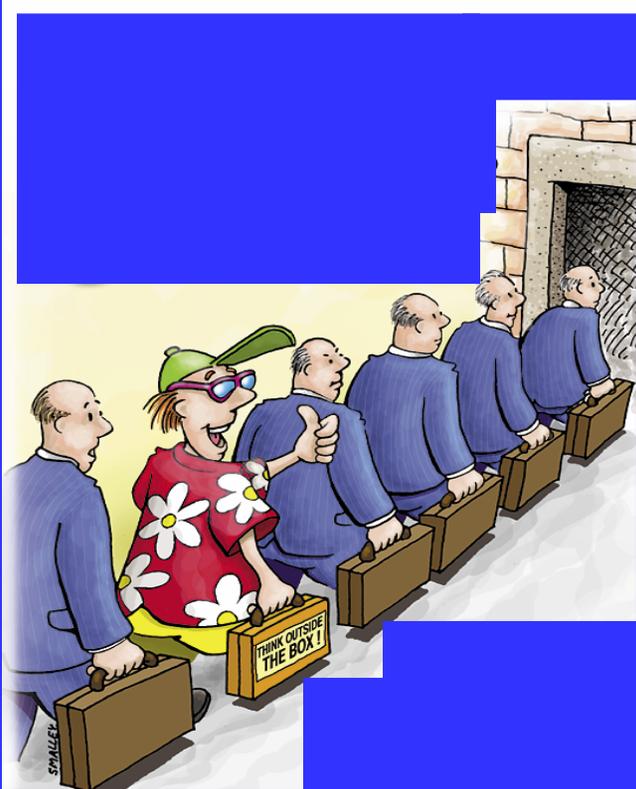


There are EVM Methods that Provide Improved Performance at a Lower Cost



The most cost effective strategy

Hey Felix, I heard you implemented EVM at your Department last week. How'd it go?



Great!!!!!!!!!!!!!!!

We set up our work as LOE and until the accounting system is ready are estimating actuals by using the earned value.
No problem.



Using EVM on FFP, while not a legacy practice, does have efficient solutions

OMB Circular A-11

Paragraph 1.5.3.4, Planning for Acquisition Management

Performance-based management systems (e.g., earned value management system as described in Appendix Four) should be used on both fixed price and cost type contracts.

ANSI/EIA 748

The Standard does not include contract type references to prime contracts.

NDIA Intent Guide

The Intent Guide does not include references to contract type.

Equivalent Unit EVM Method is a cost effective EVM implementation for FFP Production

Earned Value Method - Equivalent Units

**The budget value (BCWS) is based on a per unit value.
The units earned or accomplished and the budgeted
per unit value determines the value earned.**

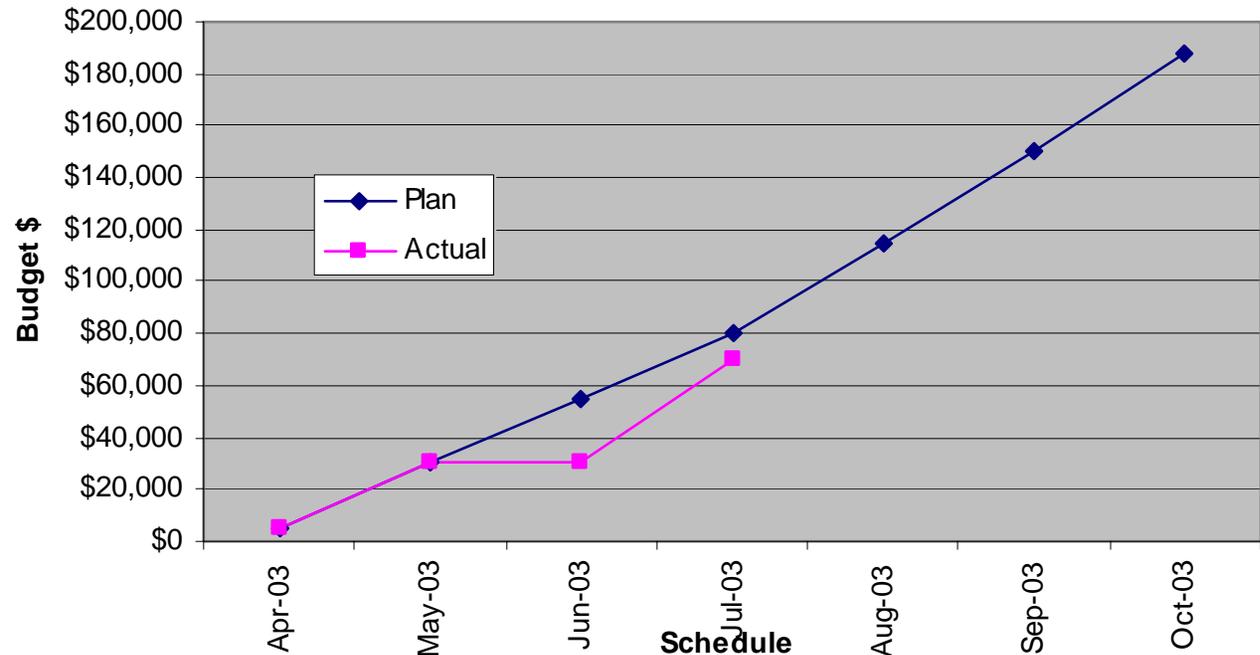
**Equivalent units are used for fixed price production
control accounts. This earned value method provides
for partial earned value when the actual units are less
than planned units.**



Equivalent Unit earned value method can be used for FFP production contracts

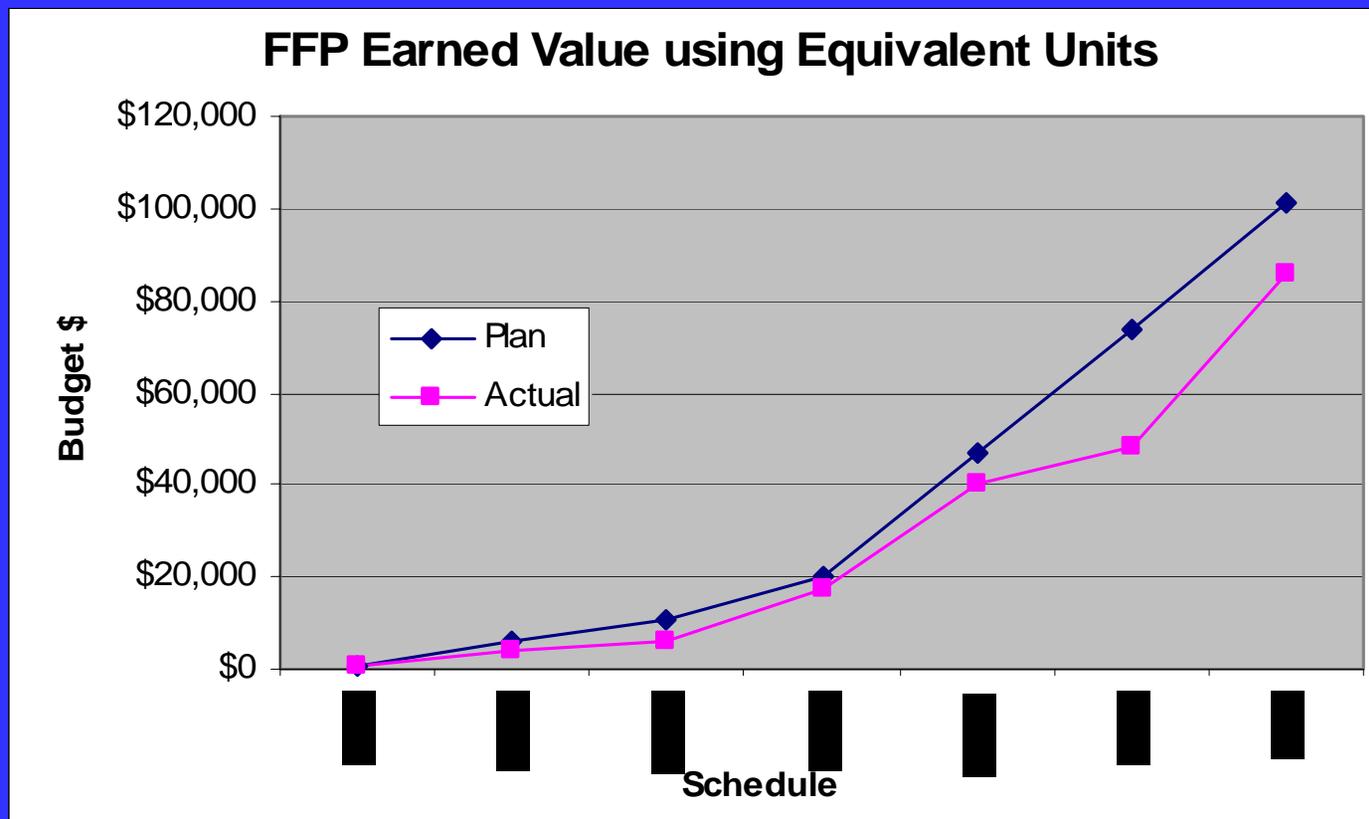
Control Account	Control Account Title WP# WP Description Task/Milestone Description		EV Method		Actual Start Date	Actual Finish Date	BAC % of CA/WP	BAC \$	Earned Value \$	Earned Value %	Baseline Start Date	Baseline Finish Date
			Actual	Plan								
02.3.3.5.2	Production Deliveries - Base Year						\$2,700,000	\$648,000	37%	08/31/02	11/30/03	
02.3.3.5.2.1	WP 1	Produce / Deliver Lot 1			08/31/02	04/10/03	3%	\$72,000	\$72,000	3%	08/31/02	04/10/03
		Pre-Production (10 Units)	10	10			100%	\$72,000	\$72,000	100%		
02.3.3.5.2.2	WP 2	Produce / Deliver Lot 2			11/01/02	05/31/03	13%	\$360,000	\$360,000	13%	11/01/02	05/31/03
		Production (50 units)	50	50			100%	\$360,000	\$360,000	100%		
02.3.3.5.2.3	WP 3	Produce / Deliver Lot 3			01/01/03	07/15/03	13%	\$360,000	\$360,000	13%	12/01/02	06/30/03
		Production (50 units)	50	50			100%	\$360,000	\$360,000	100%		
02.3.3.5.2.4	WP 4	Produce / Deliver Lot 4			02/01/03		13%	\$360,000	\$216,000	8%	01/01/03	07/30/03
		Production (50 units)	30	50			100%	\$360,000	\$216,000	60%		
02.3.3.5.2.5	WP 5	Produce / Deliver Lot 5			03/01/03		19%	\$504,000	\$0	0%	02/01/03	08/31/03
		Production (70 units)		70			100%	\$504,000	\$0	0%		
02.3.3.5.2.6	WP 6	Produce / Deliver Lot 6										
		Production (70 units)		70								
02.3.3.5.2.7	WP 7	Produce / Deliver Lot 7										
		Production (75 units)		75								
		TOTAL	140	375								
			37.3%									

FFP Earned Value using Equivalent Units



Long Lead Production can be used using the Equivalent Unit EVM method

- Long Lead = 3 Months @ \$100 / unit
- Remaining Production @ \$400 / unit



Performance Based Payments can be used to implement EVM on FFP non-recurring contracts

DoD User's Guide to Performance Based Payments (PBP) Nov - 2001

- Fixed price contract payments based on measurable technical and schedule accomplishments
- Payment milestones / events are identified and valued in advance of the contract
 - Payments verification methods are defined
 - While payment values are based on cost, the payment event is not based on cost incurred
- FFP PBPs reduce “Cost” & “EVM”:
 - Government oversight
 - Supplier compliance & reporting

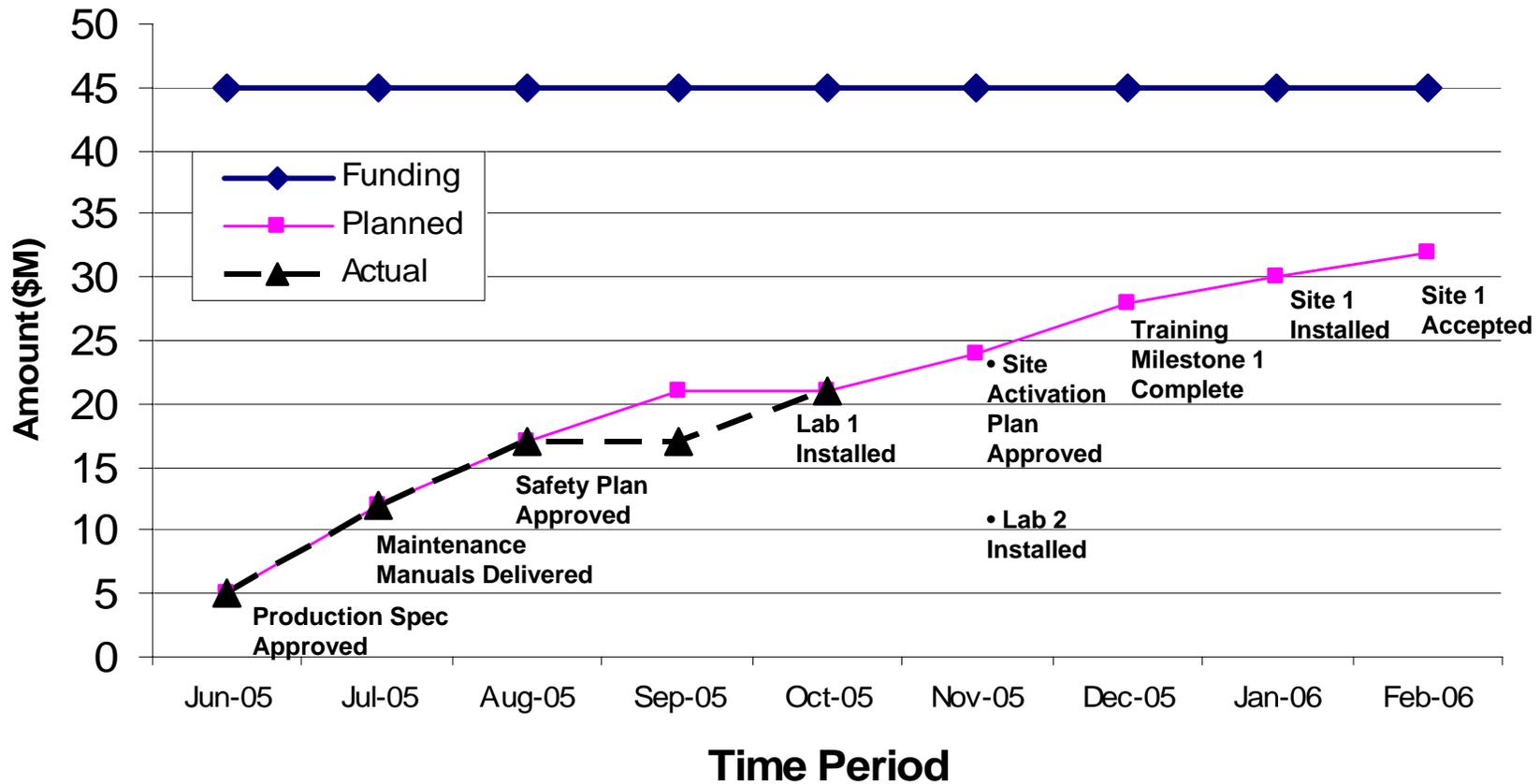


PBP's Define Key Measurable Events / Deliverables, Method of Verification, and Value

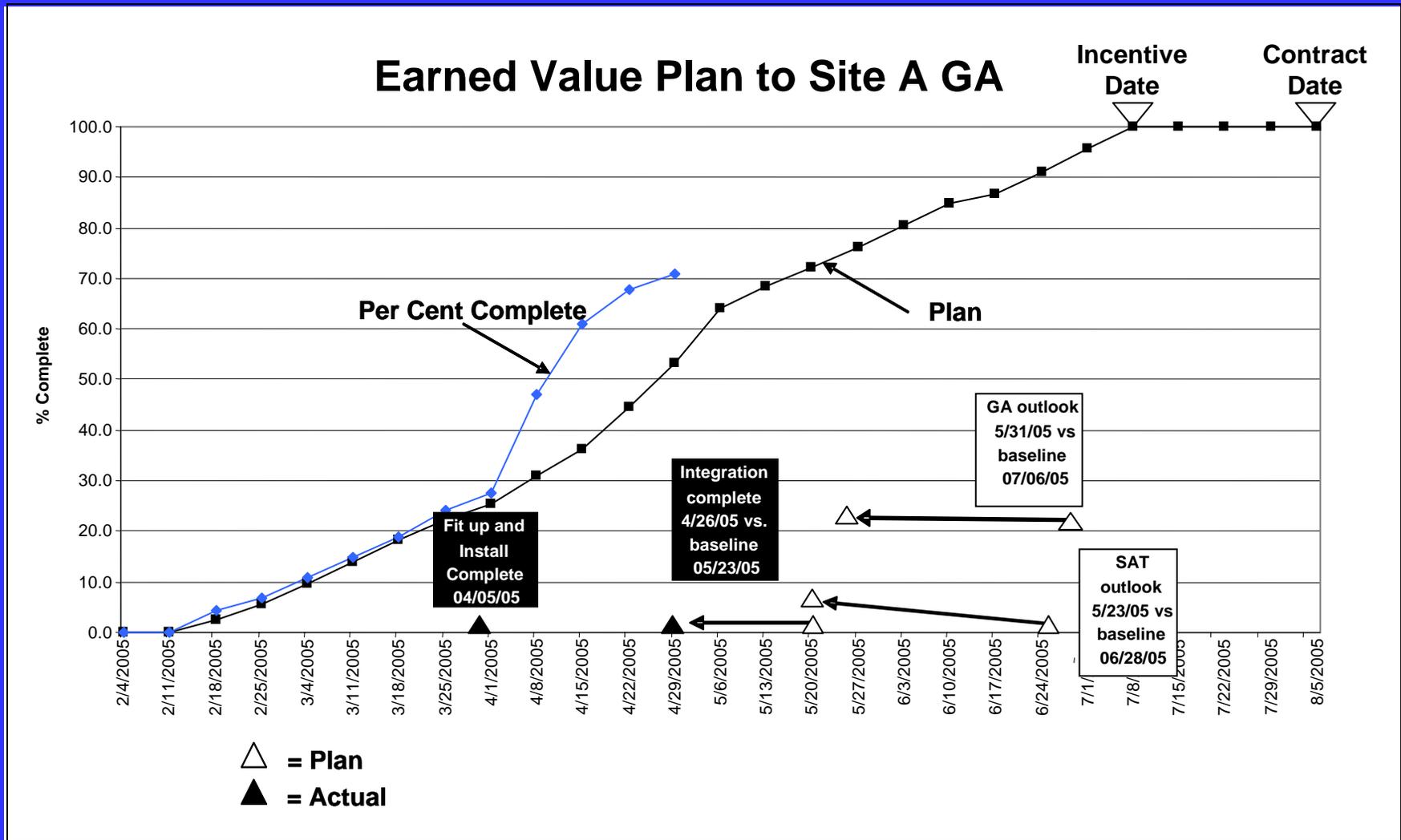
PBP No.	Performance Based Payments Milestones and Verification Method					
	Event /CDRL	Completion / Delivery Date	Accomplishment Expected	Method of Verification	Invoice Artifact	Value % PBP
1	Product Specification (CDRL ABC)	9/30/04	Final Product Specification (CDRL ABC) Acceptance	FAA Written Acceptance	Copy of Customer acceptance	0.5%
2	Final Commercial Manuals, Drawings, and Data (CDRL ACD)	3/30/05	Acceptance of manuals submitted CDRL ACD	FAA Written Acceptance	Copy of Customer acceptance correspondence	1.5%
3	LAB A Test Readiness Review	6/30/05	Completion of TRR at LAB A for Formal System Acceptance Testing	FAA Test Director approval of TRR completion	Copy of Test Director TRR completion approval	0.2%
4	LAB A Gov't Acceptance	9/30/05	Completion of all System Test and completion of post test briefings.	Signed Form 256	Copy of signed Form 256	2.0%
5	Key Site GA	3/30/06	Completion of all System Test and completion of post test briefings.	Signed Form 256	Copy of signed Form 256	2.5%
6	Site 2 GA	9/30/06	Completion of all System Test and completion of post test briefings.	Signed Form 256	Copy of signed Form 256	1.5%

Performance Based Payments provide EVM method for plan value and earned value

Contract ABC Performance Based Payments



Supplier Earned Value Data (without costs) can be Obtained to Monitor PBP Progress



There are efficient and effective EVM methods for fixed price contracts

Summary - Fixed Price EVM Techniques

- **Production – Equivalent Unit earned value method**
 - Accurate and timely performance data
 - Long Lead performance visibility
- **Non-Recurring – Performance Based Payments**
 - PBPs are based on measurable technical and schedule accomplishments – **similar to EVM**
 - PBP milestones / events are identified and valued in advance of the contract – **similar to EVM**
- **Both reduce “Cost” & “EVM”:**
 - Government oversight
 - Supplier compliance & reporting

Apportioned EVM methods are efficient and effective

Apportioned EVM Method

- Not directly measurable, however, progress (percent complete) is related to other tasks/milestones
 - Examples include:
 - SE support during site test
 - QA support during deployment
- Planned work and performance is based on related effort

Most legacy EVM implementations for sustaining support activities use level of effort (LOE)

- Difficult & costly to establish measurable EVM methods



Sustaining Support Activities are Apportioned EVM Method candidates



Site Acceptance Test - \$100K	Estimate At Completion Planned Value \$100 Cum PV = \$75 Cum EV = \$50 Cum AC = \$75 CPI = .67 EAC = \$100/.67 = \$150
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">Test Planning</div> <div style="margin-bottom: 10px;">Installation & Integration</div> <div style="margin-bottom: 10px;">System Test</div> <div style="margin-bottom: 10px;">Functional Test</div> <div style="margin-bottom: 10px;">User Demo</div> <div>Test Approval</div> </div>	

Systems Engineering Sustaining Support - \$10K	EAC = \$15
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Apportioned EVM Metrics

SE % Complete =
Site Test %
Complete



Planned Value \$10
Cum PV = \$7.5
Cum EV = \$5.0

CPI = .67
EAC = \$10/.67 = \$15
Cum AC = \$7.5

Cost Effective Implementation of EVMS

SUMMARY

- **Many EVM Practices are based on:**
 - **Legacy Environment of Large Complex High Value Contracts**
 - **Customer – Supplier Relationships**
 - **Cost Plus Contracting**
 - **Legacy EVM Applications**
- **There are better and more efficient EVM methods available**