

It's Time to "Reboot" EVM

NDIA IPMD Spring Meeting
Bethesda, Md.
May 18, 2023



Wayne Abba





**IT'S TIME TO "REBOOT"
EARNED VALUE MANAGEMENT**
Wayne F. Abba
Defense Acquisition March-April 2023

<https://www.dau.edu/library/defense-atl/blog/Reboot-Earned-Value-Management>



ACCELERATE **CHANGE**

OR
LOSE

AUGUST 2020

GENERAL CHARLES Q. BROWN, JR.
AIR FORCE CHIEF OF STAFF

[https://www.af.mil/Portals/1/documents/csaf/CSAF_22/CSAF_22
Strategic Approach Accelerate Change or Lose 31 Aug 2020.pdf](https://www.af.mil/Portals/1/documents/csaf/CSAF_22/CSAF_22_Strategic_Approach_Accelerate_Change_or_Lose_31_Aug_2020.pdf)



PLANNING FOR THE FUTURE OF EARNED VALUE MANAGEMENT

Chad Reynolds

Defense Acquisition March-April 2023

<https://www.dau.edu/library/defense-atl/blog/PlanningfortheFutureofEarnedValueManagement>

Back to the Future ...

- “The second proposed change for DoD consideration is in the presentation of EVM data to decision makers. I have seen countless awkward attempts to summarize contract status on a PowerPoint presentation, perhaps showing a metric (such as CPI) colored red, yellow, or green based on the overall contract performance. Even if the PM has some understanding of what CPI represents, how is that metric actionable?”

Chad Reynolds, Defense Acquisition March-April 2023

My DoD EVM Analysis Experience

- A-10
- A-12
- B-1
- B-2
- C-17
- DDG-51
- F-18
- F-22
- C-130H & J
- CH-47 Chinook
- Apache
- Longbow
- Blackhawk
- Kiowa
- Seahawk
- Comanche
- T-45
- T-46
- CVN-68
- SSN-21
- SSN-688
- SSN-774
- TASS
- NOE-6
- LHD-1
- Crusader
- M1 Abrams
- M2/M3 FVS
- MK-48 ADCAP
- MK-50 ALWT
- SSBN-726
- CG-47
- MH-53
- V-22 Osprey
- P-3 Orion
- RCAS
- LIF Hawk
- B-1 Engines
- F-414-GE-400 Engines
- Chem. Demilitarization
- D-5 TRIDENT II
- Javelin
- Pershing II
- FAMECE/UET
- Satellites
- AN/BSY-2
- THAAD
- ABL
- GBL
- *** Aggregate overrun 5.5% on 115 largest DoD contracts (\$3.0B on \$84.8B @ 60% complete), adjusted for over target baselines a/o 4/30/2000**

*** OUSD(AT&L)ARA/AM, 1/16/01**

Center for Naval Analyses Study

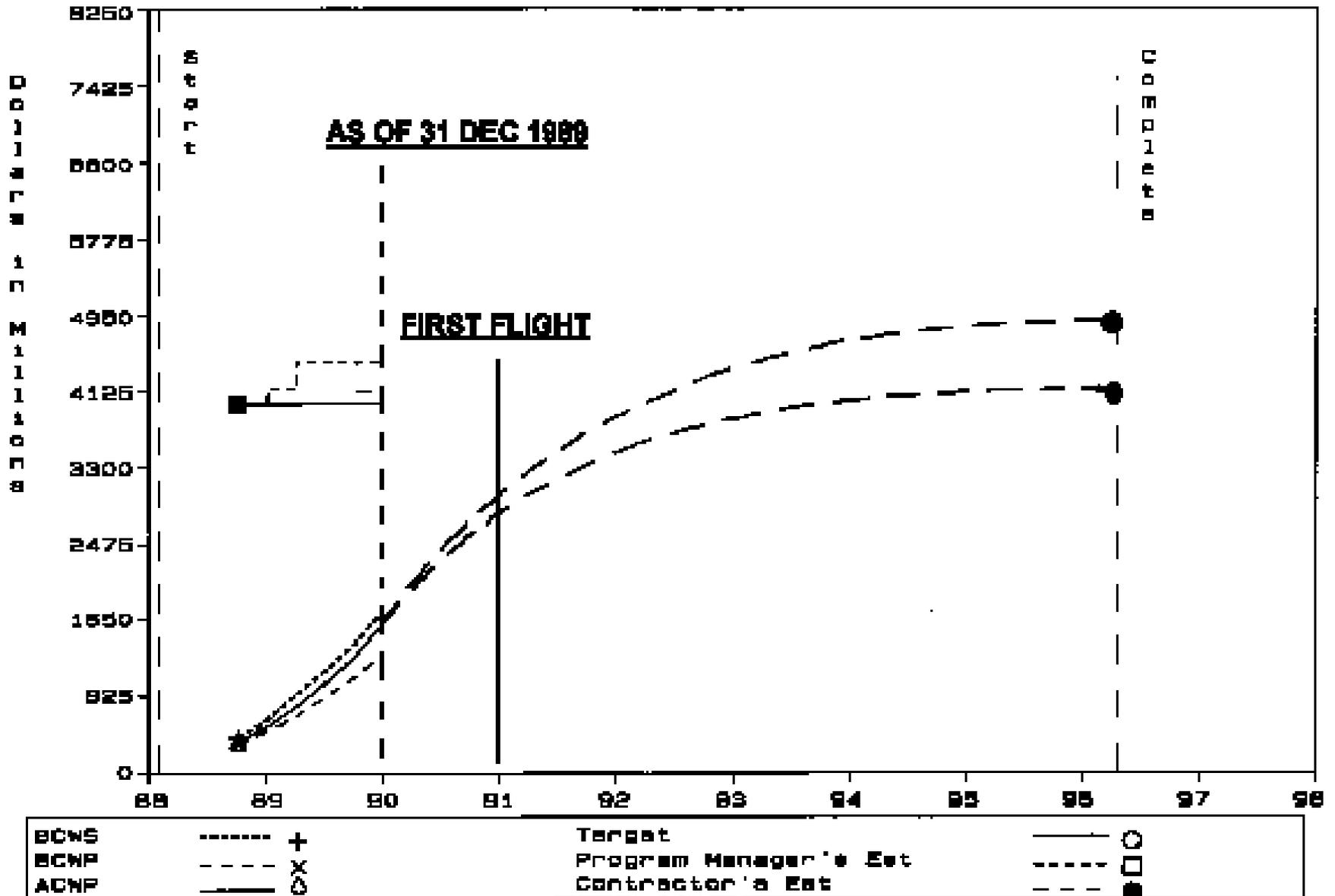
- CAB D0004960.A2 / Final "Improving Metrics for Acquisition Management" (cited w/permission) November 2001 – Gary Christle, author
 - Assessment of current acquisition metrics and processes used by the (ASN(RDA) in overseeing execution of the Navy's portfolio of acquisition programs
 - Top 5 Aerospace & Defense contractors and Navy "value chain"
 - Two highest industry priorities are **cash flow and profit**
 - Industry use of EVM metrics nearly universal
 - Industry's view – government customers should use EVM-based metrics for oversight

CONTRACT PERFORMANCE

DD/MCAIR

A-12 ADV TBC ACFT (N)

A-12 FEED N00019-88-C-0050 (FPI)

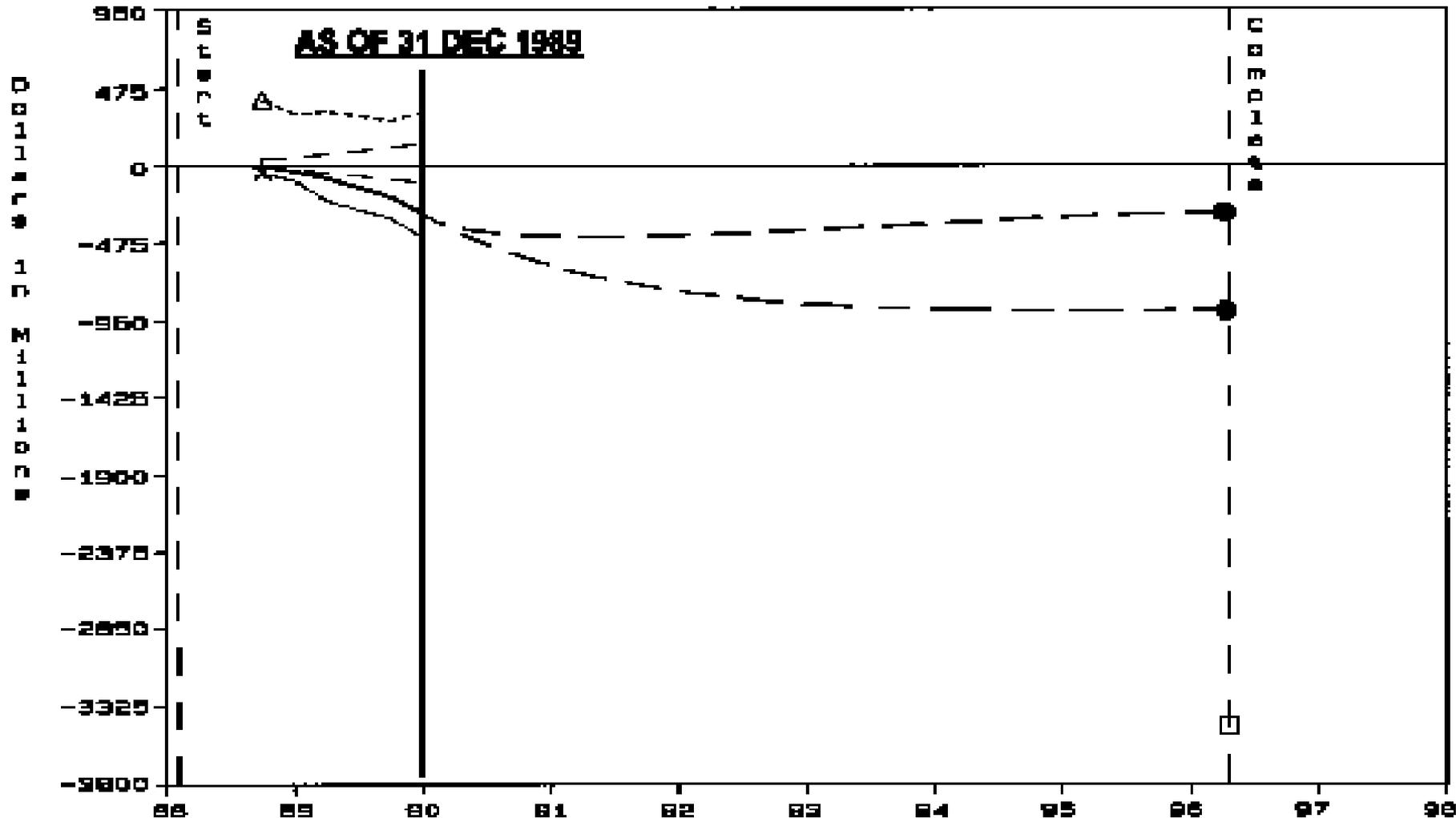


COST/SCHEDULE VARIANCE TRENDS

8D/MCAIR

A-12 Adv Tac Acft (N)

A-12 FSED N0001B-88-G-0050 (FPI)



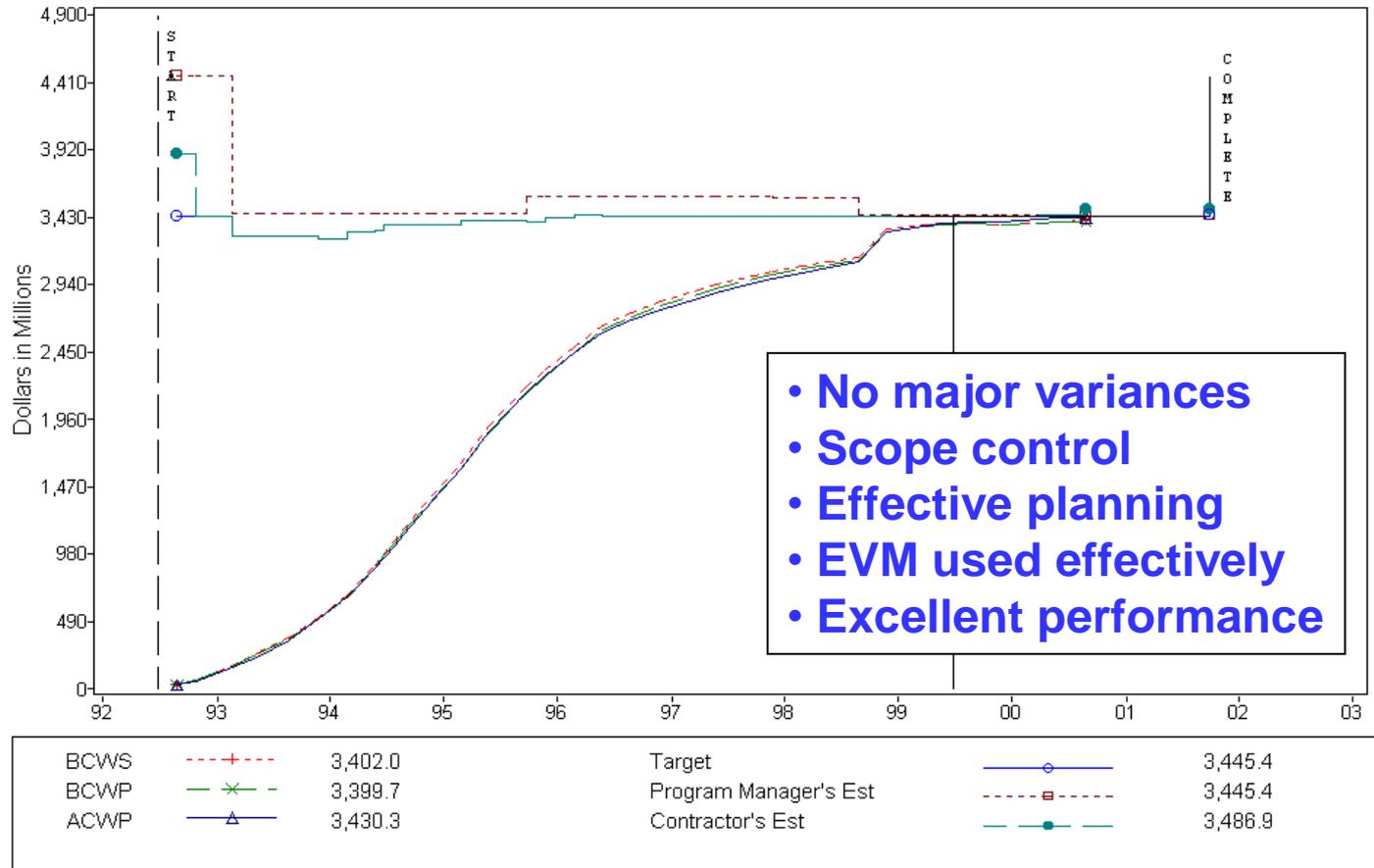
Cost Variance	——— +	10% Thresholds	- - -	Cost var @ Completion	●
Sched Variance	——— X	Start/Comp Date	———	PM	□
Mgmt Reserve	- - - Δ			CONTR	●

F/A-18E/F Contract Performance

CONTRACT PERFORMANCE

MCDONNELL DOUGLAS
Airframe EMD N00019-92-C-0059 (CPAF/IF)

F/A-18 E/F
As of 7/31/2000



The Original Purpose (DoDI 7000.2)

- 1. To provide an adequate basis for **responsible decision-making by both contractor management and DoD components**, contractors' internal management control systems must provide data which (a) indicate work progress, (b) properly relate cost, schedule and technical performance accomplishment, (c) are valid, timely and auditable, and (d) **provide DoD managers with information at a practicable level of summarization.**

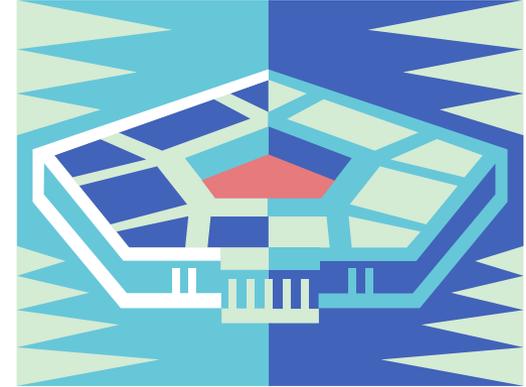
EVM System Definition

- An EVMS for program management will effectively integrate the work scope of a project with the schedule and cost elements for optimum program planning and control. **The primary purpose of the system is to support program management.** The system is owned by the organization and is governed by the organization's policies and procedures.

*EIA 748-98
Earned Value
Management Systems*

Meanwhile, Back at the Pentagon -

- EVM emphasis declined in early 2000's after Clinton-Gore Acquisition Reform era ended
 - Leadership changes and inertia
 - Industry missed the opportunity to govern itself under EIA-748
 - Reverted to audit/reporting system
 - Related skills declined
 - Systems engineering (MIL-STD-499)
 - Oversight relaxed in favor of contractor responsibility
 - Problems emerged in programs
 - EFV, ARH, Ships, Presidential Helo, JSF, etc.
 - Nunn-McCurdy breaches
 - EVM misapplied
 - Government – Perverse contract reporting incentives
 - Contractors – Gaming the system – Baseline, Management Reserve, UCA...



Naval Audit Service Report N2007-0002 October 24, 2006

- “Oversight of Earned Value Management for Naval Acquisition Programs”

“DCMA, the executive agent for EVM, has yet to take any significant actions to address the weaknesses of the implementation and oversight of EVM within DoD and DON identified by our audits and other audit agencies’ reports. As noted in this and other reports, the lack of action continues to impact key aspects of integrated management processes and practices necessary for successful management of cost, schedule, and performance of Naval acquisition programs. These continuous and long standing performance issues can also be attributed to USD (AT&L) not providing sufficient guidance and oversight to DCMA, as the executive agent for EVM.”

Pentagon Response

- Beefed-up Defense Contract Management Agency EVM Center
- More reviews, more data, more bureaucracy, more cost
 - Aggressively undid reforms
 - Reverted to oversight with no industry input
 - “New Sheriff in Town”
 - Lost in Translation -
 - Executive understanding & involvement
 - Integrated management – systems engineering, cost estimating, contracting, risk management
 - Hold contractors responsible and accountable with minimal oversight
 - Meet project managers’ needs for timely, reliable information



2008 EVM Implementation Practice

- *GREATLY disappointing . . .*

. . . Abuse -- I'd offer that DCMA comes to all companies, regardless of size or evolutionary station (from non-traditional, to small, to medium, to "eisenhower" size company) with only one approach.

- There is no tailoring,
- no consideration, and
- a set of interpersonal that remind one of the bullies from the elementary school playground.

2008 EVM Implementation Practice (cont'd)

- I lost the lady that was my software lead for our largest program following the last audit. A quote for you from her,
 - *“Those people are coming back. I shall not be working here when that happens.”*

2008 EVM Implementation Practice (cont'd)

- The thing that bothered me the very most is that the "visitors" were
 - Pure mechanics
 - Deep understanding of what we (DoD) tried to accomplish w/ EVMS, was sadly missing.
 - little interest in the quality of the cost estimation at the get-go
 - not much interest in the accuracy of the planning
 - it was all about collecting data, turning the crank, and
 - ***A desire for administration that would have more labor applied to EVMS than we had going into design!***

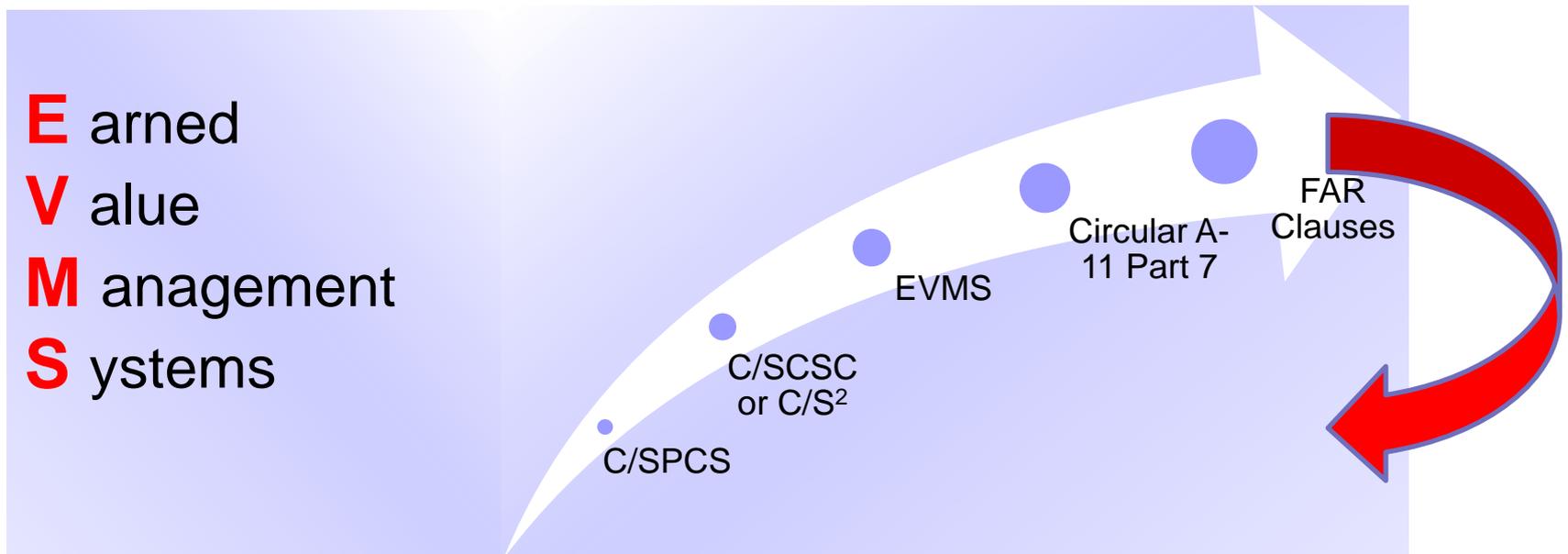
2008 EVM Implementation Practice (cont'd)

. . . their power and ability to punish are such that I must ask you not to identify me or the company.

President
End item developer & producer
April 2, 2008

US Government EVMS Policy

- 1966 – Air Force Cost/Schedule Performance Control Specification
- 1967 – DoD Cost/Schedule Control Systems Criteria
- 1996 – OMB adopts C/SCSC in Circular A-11, Part 3
- 1997 – DoD adopts EVMS; OMB follows suit in A-11 Part 3 (now Part 7)
- 2006 – Federal Acquisition Regulation Clauses issued
- 2011 – DFARS Business System Rules



Redefining the Purpose of EVMS

■ DFARS 252.242-7005 Contractor Business Systems.

- (1) Accounting system
- (2) Earned value management system
- (3) Estimating system
- (4) Material management and accounting system
- (5) Property management system
- (6) Purchasing system
- Payment Withholding:
 - (A) Five percent for one or more significant deficiencies in any single contractor business system; and
 - (B) Ten percent for significant deficiencies in multiple contractor business systems.

Weaponized EVMS

REUTERS BUSINESS NEWS OCTOBER 16, 2013

- [Pentagon spokesman] Urban said the agency was withholding payments ranging from 2 percent to 5 percent from two Lockheed units, two United Technologies units, Northrop, and AAI Corp, a unit of Textron Inc [TXT.N](#), for problems with their respective "earned value management systems," or EVMS.
 - How has that helped assure successful outcomes?
 - How do people today perceive EVMS in government and industry?
 - What are the measures of effectiveness?

Meanwhile, at the FAA...

- GAO “High Risk List” mid-1990s
- OMB FAA budget reduction 2004
- Began major transformation 2005
 - Policy
 - Guidance
 - Training
 - Program assessments
- EVM at Program Level
 - Prime, sub and support contractors
 - Government employees
- Working teams
 - Systems Engineering, Risk Management, Cost Estimating, Contracting, Finance, Operations
 - EVM Council
- Building on DoD Experience





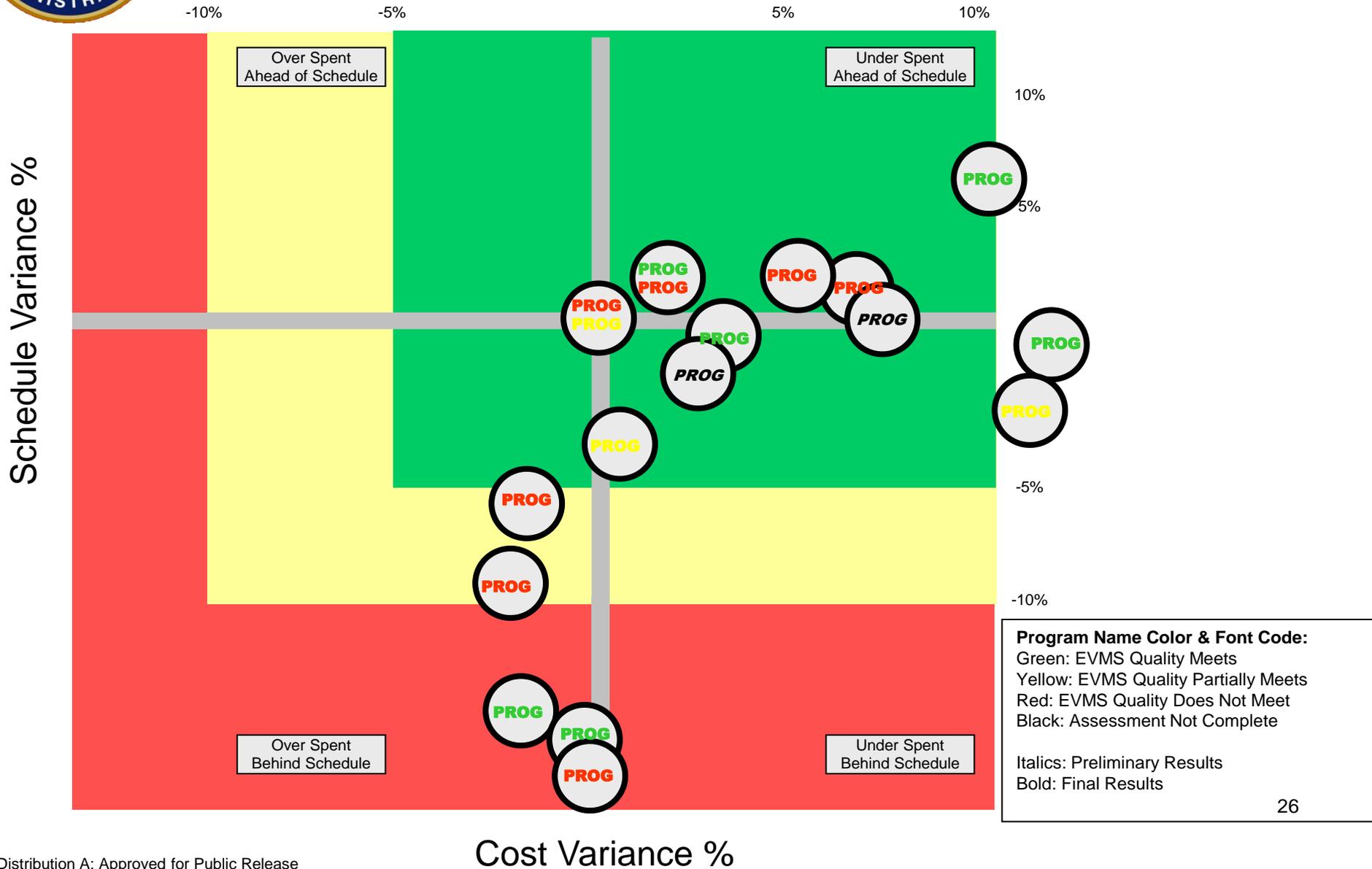
FAA EVM Assessment Summary (Baseline 2005)

Guideline	Organizing					Planning										Performing & Accounting								Analysis & Reporting					Change Management									
	WBS	OBS	WBS/OBS Integration	WBS/OBS Reporting	Average	Schedule / interdependencies	Schedule Milestones	Time Phased Budget Baseline	Budget Elements of Cost (EOC)	Control Account WP & PP	Control Account budgeting	LOE budgeting	MR & UB	Program budgeting	Average	Overhead responsibility	Overhead budgeting	Record direct costs	Summarize CAs into WBS	Summarize CAs into OBS	Record indirect costs	Identify unit costs	MMAS	Indirect Cost Variances	Average	Cost & Schedule Variances	Variance Analysis Reports	WBS/OBS Variances	Corrective Actions	Estimates at Completion	Average	Timely Change Planning	Reconcile Change	Control Retroactive Changes	Limit to Authorized Changes	Document PMB Changes	Average	
	1	2	3	5	Sum	6	7	8	9	10	11	12	14	15	Sum	4	13	16	17	18	19	20	21	24	Sum	22	23	25	26	27	Sum	28	29	30	31	32	Sum	
Prog 1																																						
Prog 2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 3	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 4	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
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Prog 6	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 7	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
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Prog 10	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 11	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 12	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 13	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 14	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 15	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 16																																						
Prog 17																																						
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Prog 19																																						
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Prog 22	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 23	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 24	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Blue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Prog 25																																						
Prog 26																																						
FAA Average																																						

 Agency-Level Guideline not assessed at the Program Level
 Based on Unique Aspects of the Program this Guideline was Not Applicable
 Program Completely in Either the Planning or O&M Phase of the Life Cycle (Guidelines Not Assessed- Transition Plan Provided)
 This Pattern Indicates that the Program is Between a Green and Yellow Assessment Rating
 Assessment has NOT been completed



FAA Major Programs – EVM Metrics



Major Milestone for the FAA

- January 2009 – after 14 years, GAO removed Air Traffic Control Modernization program from its list of high risk programs and operations
 - Significant progress
 - Fewer overruns and schedule delays
 - Going forward – emphasize effective and efficient management
- The only program removed from the list
- EVM played a significant role

And at the National Science Foundation...

Management Reserve & Contingency

National Science Foundation

December 18, 2012

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National Science Foundation

■ Peer Review Panels

- Advanced Technology Solar Telescope (now Daniel K. Inouye Solar Telescope)
- Laser Interferometer Gravitational-wave Observatory
- ATLAS & CMS Experiments at CERN Large Hadron Collider
 - Dept. of Energy participation
- Giant Magellan Telescope
- Thirty Meter Telescope
- Follow GAO “Best Practice” Guides
- EVM incorporated in planning and review process

■ Research Infrastructure Office

- Balance between assistance and oversight
- Objective is to achieve a successful project outcome

DOE Integrated Project/Program Management (IP2M)

- Journal of Management in Engineering Volume 38 Issue 3 - May 2022
 - “Forward-Looking State-of-the-Art Review on Earned Value Management Systems: The Disconnect between Academia and Industry”
 - Literature search found 5 “Abba” references (actually 4 – 1 duplicate), 1 bolded for further inquiry, an article from 2017
- “One interesting finding is that EVMS maturity, although being a critical topic, is only discussed in one publication.”
 - [GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs](#) is not included in the literature review
 - GAO 2009: “companies that do establish a good EVM system realize better program management decision making and have fewer cost and schedule overruns and potentially greater repeat business”

The DOE Integrated Project/Program Management (IP2M) (Cont'd)

- Abba, W. (1986). "Cost/Schedule Control Systems Criteria White Paper." Program Manager. 15:45-47.
- Abba, W. (1989). "Over-Target Schedules." In Control. 2:135-139.
- Abba, W. F. (2000). "How earned value got to primetime: A short look back and a glance ahead." In Project management institute seminars and symposium in Houston, TX. / <https://www.pmi.org/learning/library/earned-value-college-performance-management-8909>
- Abba, W. F. (2017). "The Evolution of Earned Value Management." College of Performance Management, The Measurable News, (2), 9–12.
- Abba, W. F. (2017). "The Evolution of Earned Value Management." Defense Acquisition University. <https://www.dau.edu/library/defense-atl/blog/Defense-ATandL--March--April-2017-2-The-Evolution-of-Earned-Value-Management> (accessed June 11, 2019).
- Google search "Abba and EVM"
 - About 242,000 results (not all germane, but many more than 5)
- Lipke ("Earned Schedule") had 15 hits, 12 bolded
- I found this – with thanks (?) to Steve Wake, UK

ABBA Tribute Slide

ABBA[®]



The Mix Project 2009 - Vol. 02

“Reboot” - Resources

- Program Management Improvement Accountability Act ([Public Law No: 114-264](#))
 - The Program Management Policy Council is established within OMB to act as the principal interagency forum for improving agency practices related to program and project management
 - Acquisition Management Committee
 - Formed in 2020 under the PMPC to identify program management issues and work on specific tasks that will help advance program management in the Federal government.
 - Meets about five times per year and several agencies participate voluntarily. Activities include the development of a program management maturity model to help facilitate agency reviews and promoting standards such as Earned Value Management (EVM)
 - Working with National Science Foundation on EVM case studies/articles – counterpoint to DoD/DOE processes
 - My article distributed April 5, 2023

“Reboot” - Resources

■ Defense Management Initiative (Institute for Defense Analyses)

- Announced Jan. 31, 2023 (Maj. Gen. Abba told you of it on Feb. 1)
- “... non-profit, non-partisan research organization committed to enhancing the management, organization, performance improvement and enterprise business operations of the department”
- DepSecDef Hicks: “We owe it to the taxpayers to ensure that their resources are managed as efficiently and effectively as possible. The DMI will contribute to that effort by [learning from the best of the public and private sectors and helping us to constantly update and improve our management practices.](#)”

“Reboot” - Resources

- DoD Contract Finance Study Report, April 2023
 - Executive Summary
 - A financially healthy defense industry is essential to ensure that the Department of Defense (DoD) can procure the goods and services the U.S. warfighter needs to effectively defend our nation.
 - In 2019, the U.S. Government Accountability Office (GAO) issued a report titled “Contract Financing” and subtitled “DoD Should Comprehensively Assess How Its Policies Affect the Defense Industry” (GAO-19-406). DoD concurred with GAO’s recommendation that it conduct a comprehensive assessment of the effect that its contract financing and profit policies have on the defense industry and [update that assessment on a recurring basis.](#)
 - No reference to EVMS

Summary

- It's not just "time" – it's way past time to Reboot!
- EVMS in DoD is far removed from its proven purpose
 - Weaponized
 - No effective oversight
- Keys to success are known
 - Planning
 - Experts on teams from beginning to advise & assist
 - Emphasize achieving a successful project outcome – as opposed to an EVMS-compliant management system
 - Processes and tools tailored to size, complexity, risk...
- The world's foremost EVM/IPM experts are in IPMD
 - Engage NDIA Procurement & Systems Engineering Divisions