

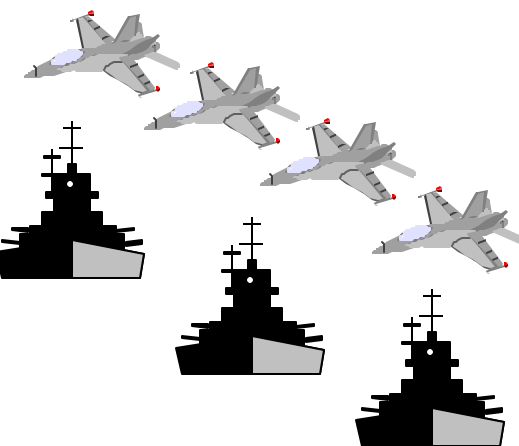


Earned Value

**A Manager's Tool for Integrated
Cost, Schedule and Technical
Performance Management**

OUSD(A&T)SA/PM

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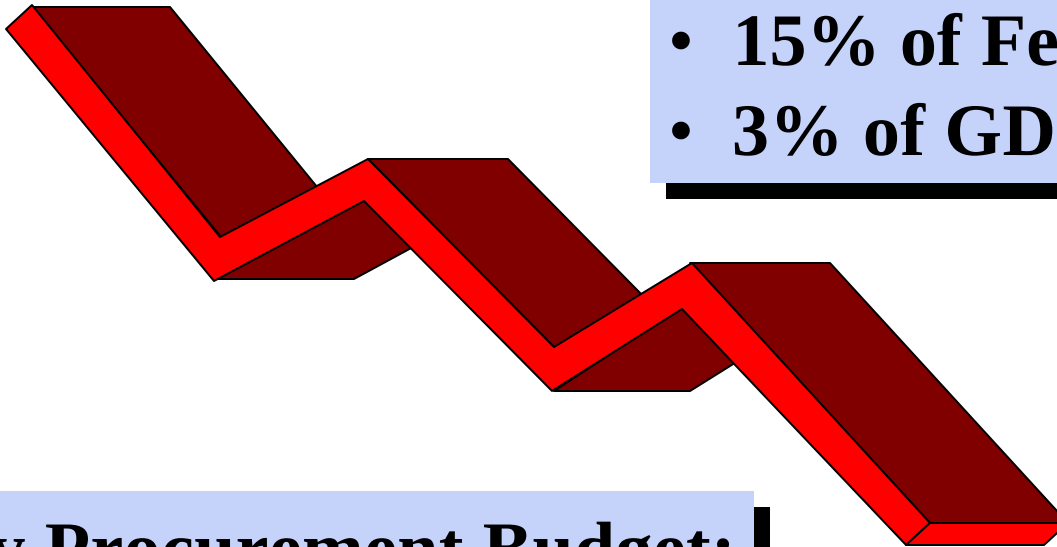
1961 Pentagon Spending:

- 40% of Federal Budget
- 8% of GDP

1997 Pentagon Spending:

- 15% of Federal Budget
- 3% of GDP

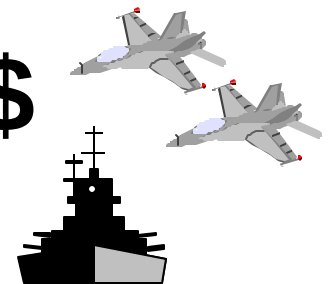
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Military Procurement Budget:

- Down 67% since 1985 peak
- \$60 Billion goal

\$



The 1990's - Shrinking Industrial Base

Lockheed
GD Mil. Jets
Sanders Assoc.



Lockheed

Martin Marietta
GD Rockets
GE Aerospace



Martin Marietta

Loral
Unisys Defense
IBM Fed. Systems
LTV Missiles
Ford Aerospace
Goodyear Aerospace



Loral



Lockheed Martin

Northrop
LTV Aircraft
Grumman
Westinghouse Def



Northrop Grumman

Boeing
Rockwell Def & Space
McDonnell Douglas



Boeing
Rockwell Def & Space
McDonnell Douglas



Boeing

Raytheon
E-Systems
Texas Instruments Def



Raytheon
Texas Instruments Def



Raytheon

Hughes Aircraft
Magnavox Def
CAE Link
GD Missiles

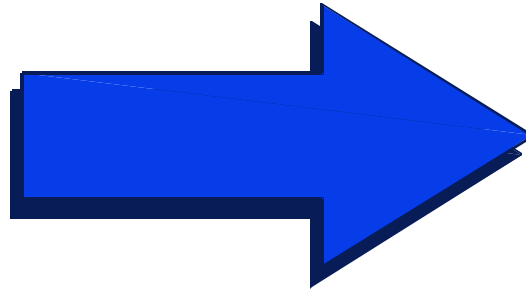
Hughes Aircraft

Reengineering EVMS

October 1993 - A Vision



Inspection



Management



Earned Value Management: Implementation Problems

- “Financial Management”
- Audit-like reviews
- **Reporting** focus
- Too many “surprises”
 - ◆ **A-12** (Navy)
 - ◆ **AAWS-M** (Army)
 - ◆ **C-17** (Air Force)
- Challenge: **keep good principles, stop bad practices**



Lesson of the A-12

The “Beach” Report, A-12 Administrative Inquiry, 28 Nov 1990

- Too often, earned value insights remain the sole province of the supporting program control staff of both contractors and the government.
 - ◆ Earned value must be an **integral** part of the performing design and manufacturing organizations.
 - ◆ Only when **program technical staffs** are held accountable for earned value analysis, will they begin to understand its implications.

The Need For Change:

C/SCSC never had a chance!

- **RFP Review Results 1991 - 1993**
- **Significant misapplication of requirements**
 - ◆ 50% have WBS problems
 - ◆ 75% have excessive variance reporting requirements

Unnecessary Cost

December, 1994, Coopers & Lybrand/TASC Study:

**“The DoD Regulatory Cost Premium:
A Quantitative Assessment”**

and

**COST/SCHEDULE CONTROL SYSTEMS
(C/SCS)**

C&L/TASC Cost Drivers:

Cost without a requirement

- **Total DoD Cost Premium is 18%**
- **C/SCS Cost Premium is 0.9%**
 - ◆ Nearly 3/4 is in Eng'g/Prog Mgmt
 - Written control account variances
 - ◆ Most of Remainder is in administrative and external reporting activities

Good idea, bad implementation

(C&L/TASC Cost Drivers)

- “In general, **industry views** the general framework and principles of cost/schedule reporting **positively**.
- However, all contractors subject to C/SCS agree that, **as currently required** by DoD, cost/schedule reporting is **too detailed, repetitive, and voluminous** to be used effectively as a management tool by either the government or industry...”

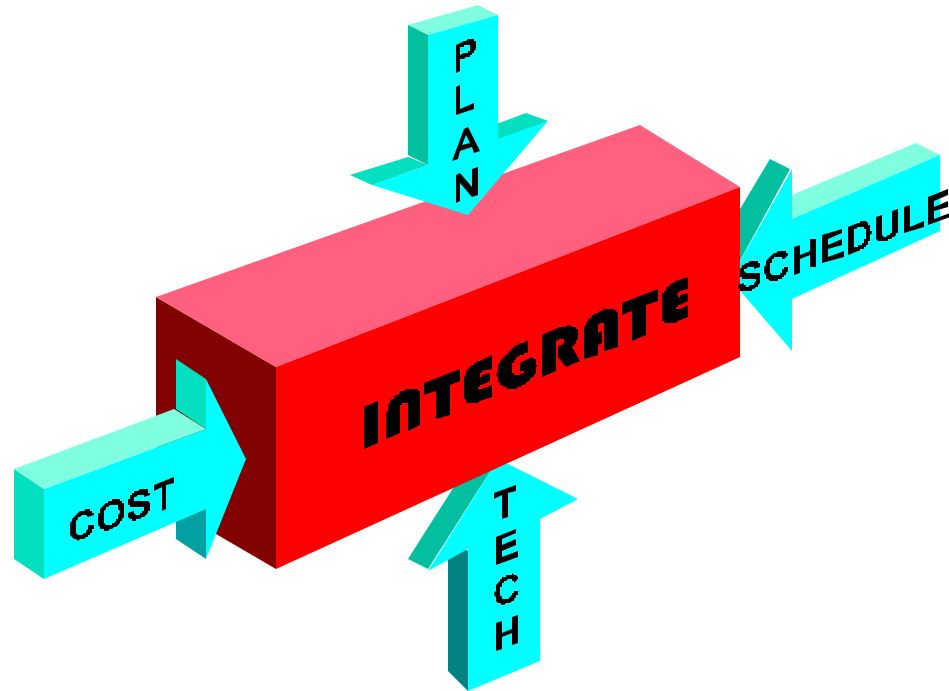
The paradigm must change

- **EVMS** reporting system is of little value;
- **Program Management**, not audits;
- **The Vision:**
 - ◆ The quality of a contractor's management system is determined
 - ◆ not by the absence of defects,
 - ◆ but by the presence of management value.

Services & industry Challenged Implement “Model Program”

- Initiated Oct 93
- Shift Ownership From Financial Management to **Program Management**
 - ◆ Change emphasis from government system to contractor systems
 - ◆ Reduce the review burden
 - ◆ Limit reporting
 - ◆ Ensure comprehensive **planning** and common understanding of the task
 - ◆ **Integrate** cost, schedule, technical performance, and risk management

The Acquisition Executives Take Charge



INTEGRATED PROGRAM MANAGEMENT INITIATIVE

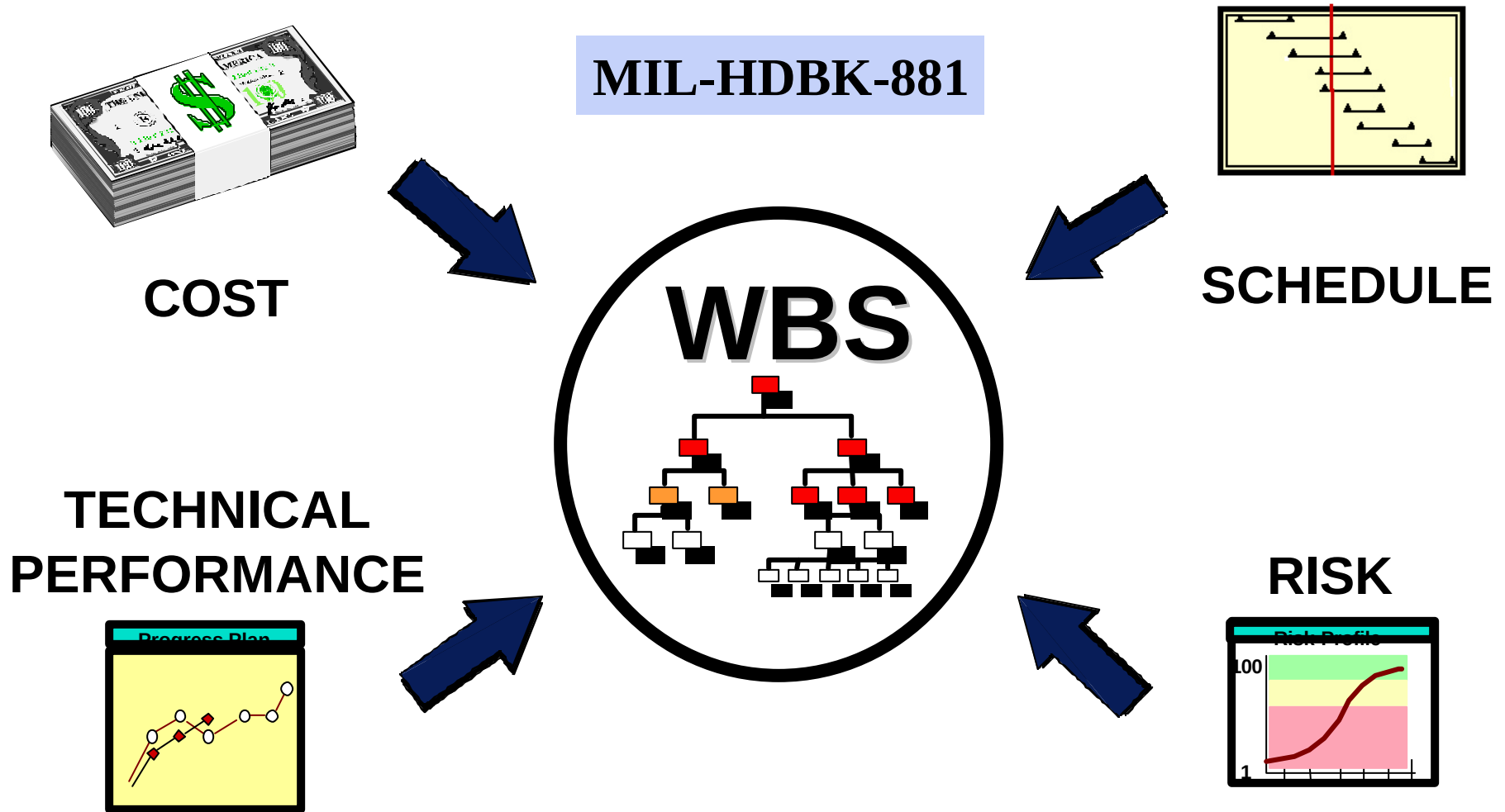
September 1994

Key Building Blocks

Integrated Program Management Initiative

- **Model Program Objectives**
- **WBS**
- **IPTs**
- **Integrated Baseline Review (IBR)**
- **“Right Size” Reporting**
- **Integrated Digital Environment**
- **Training**

Work Breakdown Structure: The Key to Integration



Reengineering EVM: Integrated Baseline Reviews

- Within 6 months of award
- Mutually understand plan
 - ◆ Scope
 - ◆ Schedule
 - ◆ Resources
- Planning process vs. event
- PM leads
 - ◆ EVM staff supports
 - ◆ Management system reviews effectively eliminated

Risk

IBR Training

- Schedules
- Mgmt. Systems



Growing Consensus:

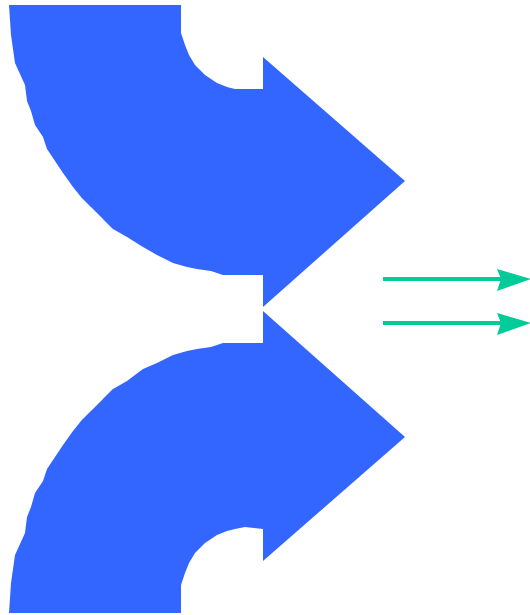
Gov't/Industry Best Practice

- **Dec. '96 DoD accepted industry EVMS guidelines as C/SCSC replacement**
- **Reserved right for government reviews**
 - ◆ **As determined by project manager**
 - ◆ **"Self-certification" not in public interest**
- **Encouraged "true" standard**
 - ◆ **ANSI/EIA 748-98 EVMS issued in 1998**
 - ◆ **DoD and industry EVMS criteria are equal**
 - ◆ **International discussions - Australia, Canada, UK, US**



Earned Value Management: Origins

Industry Best
Practices



Government
Requirements

1967: DoD Instruction 7000.2

CANCELED

Criterion-based Management

- Brief statements of attributes
- Not “how-to manage”
- Not a system
- Minimum acceptable standard

1997: DoD Regulation 5000.2-R
**32 Earned Value Management
Systems (EVMS) Criteria**

DoD Since 1993... Results!

● DoD EVM

- ◆ Value reaffirmed
- ◆ Shifted to Industry; DCMC Exec. Agent
- ◆ OMB policy
- ◆ Trilateral MoU
- ◆ Intl. Perf. Mgmt. Council
- ◆ Commercial
- ◆ In-house
- ◆ Prof. associations
- ◆ Adopted by NASA, FAA, NRO, FBI, CoE
- ◆ Enterprise-wide
 - Boeing
 - Raytheon
 - Lockheed Martin
 - and others...
- ◆ No major surprises

Aggregate overrun 5.5% (\$1.2B on \$72.8B; 66% comp.)

They're even doing it in industry!

- **Industry**

- ◆ Boeing Defense & Space Group
- ◆ Lockheed Martin Sunnyvale
- ◆ McDonnell Douglas
- ◆ Motorola Iridium tm
- ◆ Navistar
- ◆ Delta Airlines
- ◆ Delco Electronics
- ◆ Industry "Standard"
 - ANSI

- **Project Management Institute**

In-house Workshop Tasks

My Opinions

- **Validation & Surveillance**

- ◆ Policy changes?
- ◆ Who performs?

- **Implementation**

- ◆ Can in-house meet all 32 criteria?

- **Accounting Systems**

- ◆ Are DoD, non-CAS systems compliant?

- **Data Analysis & Training**

- ◆ Do PMs need EV data?

Earned Value Management Systems

Basic requirements

- **COMPREHENSIVE PLANNING PROCESS**
 - ◆ Covers entire statement of work
 - ◆ Schedules activities
 - ◆ Allocates resources
- **FULLY INTEGRATED MANAGEMENT SYSTEMS**
 - ◆ Scheduling systems integrated with one another, and with work authorization system, accounting system, MRP, work measurement system, etc. For example:
 - Interdependencies between department, functional, and/or IPT schedules (horizontal integration)
 - Interdependencies from lowest level to master schedule (vertical integration)

VISION

**The quality of a contractor's management system
is determined not by the absence of defects,
but by the presence of management value**