

**Pre-brief of
Acquisition M&S Working Group (AMSWG)
Progress Report to the
DoD Systems Engineering Forum**

Fred Myers (AT&L/DS/SE) Chair, AMSWG

Jim Hollenbach, consultant

July - August, 2005

Executive Summary

- ❑ AMSWG complied with SE Forum direction
- ❑ Followed a thorough analysis process
- ❑ No silver bullet; complex challenges require multiple actions for success. We identified:
 - 8 M&S processes that will improve systems engineering
 - 43 gaps/obstacles that impede M&S support to SE
 - 41 recommended actions to improve M&S support to SE
- ❑ Actions provide a WBS to improve M&S support to acquisition
 - Will provide incremental benefits
 - Some can be done out of hide; many leverage existing efforts; some may require POM action (TBD)
- ❑ With SE Forum concurrence, these will be used as building blocks for the Acquisition M&S Master Plan
 - The actions listed here are not the plan; they are a super-set
 - Other, non-acquisition organizations will lead many
- ❑ No hard decisions or resource implications now

AMSWG Background

Past Briefings to SE Forum

- Aug 24, 2004: “M&S Issues for Acquisition” (Hollenbach)
- Sep 22, 2004: AMSWG Charter (Myers)

SE Forum Decisions

- Feb 4, 2005: Approved AMSWG Charter

AMSWG

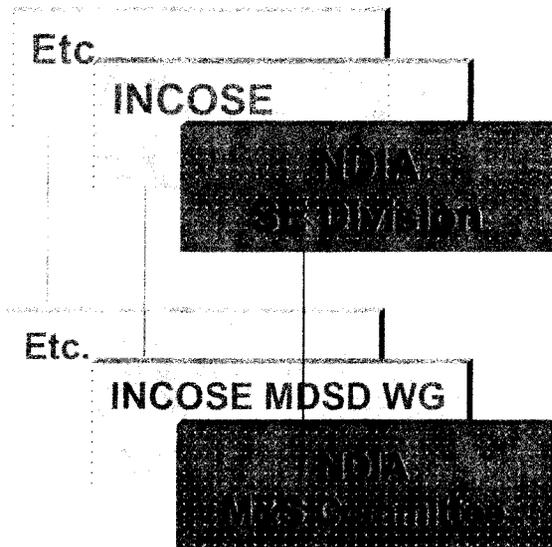
- Charter & Process follow
- Members: Aligned with SE Forum members
- Meetings: ~ Monthly since July, 2004

Organizational Relationships

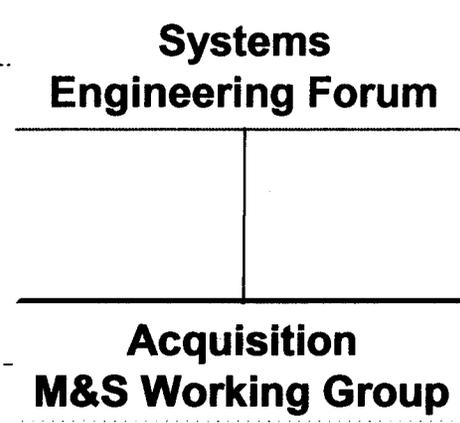
Per AMSWG Charter, approved by SE Forum Feb 2005

**AMSWG is anchored in acquisition community,
linked to industry and M&S**

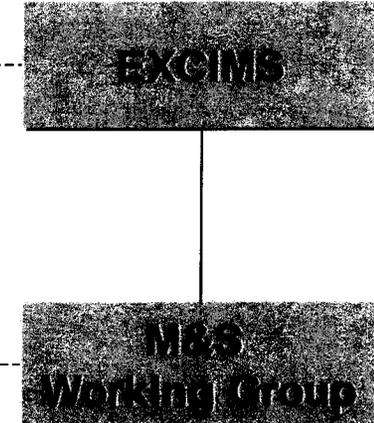
Industry / Academia



DoD SE



DoD M&S



Products

Reports (e.g., "M&S Support to the New DoD Acq. Process"), standards, papers, etc.

Product

Acquisition M&S Master Plan

Product

DoD M&S Master Plan

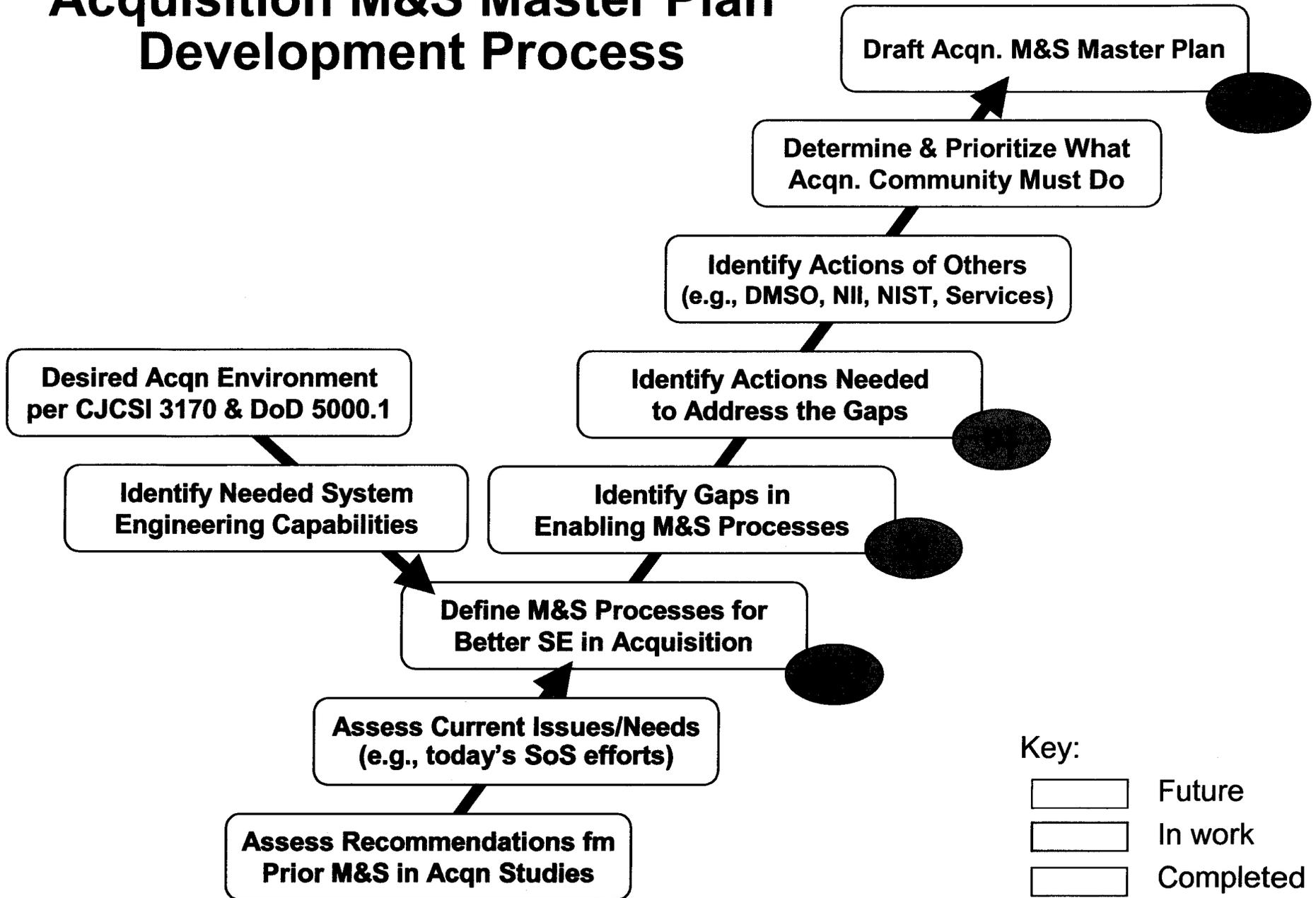
Deliverables Required by AMSWG Charter

1. Definition of M&S processes for better SE in support of systems, SoS, and FoS capability-based acquisition
2. Identification of gaps in the enabling M&S processes for better SE in support of systems, SoS, and FoS capability based acquisition
3. Recommended actions to address the gaps identified above to improve M&S technology use in acquisition, to include strategy, policy and guidance changes
4. Draft an Acquisition M&S Master Plan, if required by the DoD M&S Master Plan and SE Forum

Approach

- Work within AMSWG charter to improve M&S support to acquisition
 - Systems engineering, including T&E, is the heart of this
- Foster widely-needed M&S capabilities that are beyond the reach of individual programs
- Address M&S issues and actions necessary to enable acquisition of effective SoS capabilities
- Not seek to do the job of program/capability managers; rather seek to empower them
 - By removing systemic obstacles in their path
 - By identifying new options for approaching their tasks
 - By helping meet widely-shared needs

Acquisition M&S Master Plan Development Process



A Decade of Studies on M&S Support to Acquisition

1. *Final Report of the Acquisition Task Force on M&S, 1994*
Sponsor: DDR&E (Dr. Anita Jones); Chair: VADM T. Parker, USN (Ret.)
2. *Naval Research Advisory Committee Report on M&S, 1994*
Sponsor: ASN(RDA); Chair: Dr. Delores Etter
3. *Collaborative Virtual Prototyping Assessment for Common Support Aircraft, 1995*
Sponsor: Naval Air Systems Command; conducted by JHU APL and NSMC
4. *Collaborative Virtual Prototyping Sector Study, 1996*
North American Technology & Industrial Base Organization; sponsor: NAVAIR
5. *Application of M&S to Acquisition of Major Weapon Systems, 1996*
American Defense Preparedness Association; sponsor: Navy Acqn. Reform Exec.
6. *Effectiveness of M&S in Weapon System Acquisition, 1996*
Sponsor: DTSE&E (Dr. Pat Sanders); conducted by SAIC (A. Patenaude)
7. *Technology for USN and USMC, Vol. 9: M&S, 1997*
Naval Studies Board, National Research Council; sponsor: CNO
8. *A Road Map for Simulation Based Acquisition, 1998*
Joint SBA Task Force (JHU APL lead); sponsor: Acquisition Council of EXCIMS

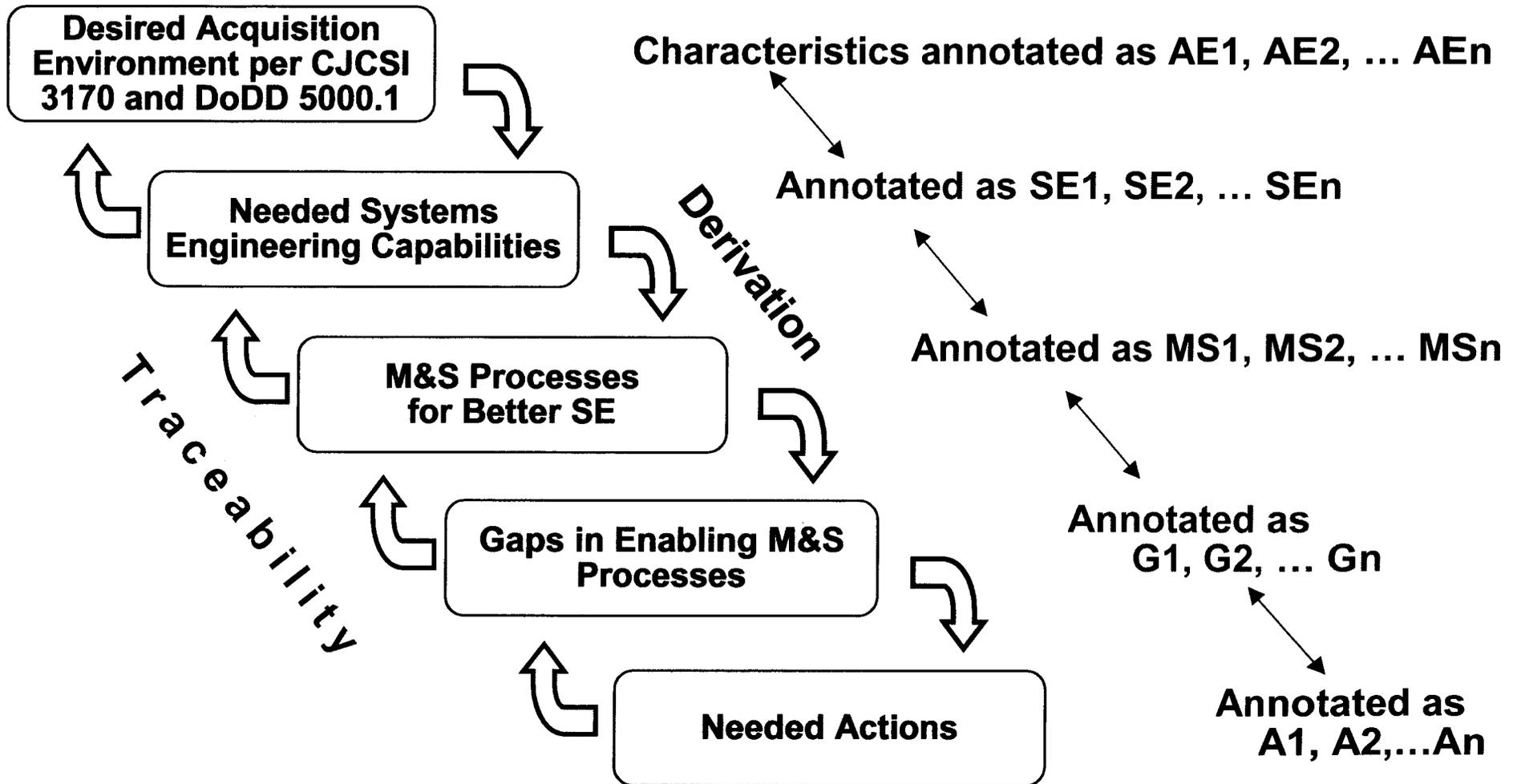
A Decade of Studies on M&S Support to Acquisition

9. *M&S for Analyzing Advanced Combat Concepts, 1999*
Defense Science Board Task Force (Co-chairs: L. Welch, T. Gold)
10. *Advanced Engineering Environments, 1999*
National Research Council; sponsor: NASA
11. *Survey of M&S in Acquisition, 1999 and 2002*
Sponsor: DOT&E/LFT&E; conducted by Hicks & Associates (A. Hillegas)
12. *Test and Evaluation, 1999*
Defense Science Board Task Force (Chair: C. Fields)
13. *“SIMTECH 2007” Workshop Report, 2000*
Military Operations Research Society (Chair: S. Starr)
14. *M&S in Manufacturing and Defense Systems Acquisition, 2002*
National Research Council; sponsor: DMSO
15. *M&S Support to the New DoD Acquisition Process, 2004*
NDIA Systems Engineering Div. M&S Committee; sponsor: PD, USD(AT&L)DS
16. *Missile Defense Phase III M&S, 2004*
Defense Science Board Task Force (Chair: W. Schneider)

Assessment of Current Issues/Needs

- Cooperative effort between AMSWG & NDIA M&S Committee
- AMSWG venue:
 - Air Force – Roe (Jan 05)
 - Army – Gillis, Wallace (Jan 05)
 - Navy – Vaughn (Feb 05)
 - Visits to NAWC/AD (ACETEF); Army RDECOM; AFMC (SIMAF, ICE)
- NDIA venue:
 - Joint SIAP Systems Engineering Organization (Aug 04)
 - Future Combat Systems (Sep 04)
 - Missile Defense Agency (Feb 05)
 - Lockheed Martin (Feb 05)
 - Raytheon (Apr 05)
 - Boeing (Apr 05)
 - Northrop Grumman (Jun 05)
- Affirmed many findings and recommendations from studies and provided new inputs as well

Top-Down Derivation/Cross-Check



Desired Acquisition Environment: Key CJSCI 3170.01E Policies

- ^{AE1} Joint concepts-centric capabilities identification process to allow joint forces to meet the full range of military operations and challenges...
- Assess existing and ^{AE2} proposed capabilities in light of their contribution to future joint allied and coalition operations. ... Produce capability proposals that consider the full range of ^{AE3} DOTMLPF solutions in order to advance joint warfighting in a unilateral and multinational context.
- ^{AE4} New solution sets...crafted to deliver technologically sound, testable, sustainable and affordable increments of militarily useful capability.
- ^{AE5} The FoS and SoS solutions may also require systems delivered by multiple sponsors/materiel developers. ^{AE6}
- The process to identify capability gaps and potential solutions must be supported by a robust analytical process ^{AE7}
- ^{AE8} JCIDS implements a capabilities-based approach that...requires a collaborative process that utilizes joint concepts and integrated ^{AE9} architectures to identify prioritized capability gaps and integrated ^{AE10} DOTMLPF and policy approaches to resolve those gaps

AE11

(((

Desired Acquisition Environment: DoDD 5000.1 Acquisition Policies

“The primary objective of Defense acquisition is to acquire ^{AE12} quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price.”

AE13 AE14 AE15

Governing policies:

- *Flexibility, ^{AE16} Responsiveness, ^{AE17} Innovation, Discipline, Streamlined Effective Management*
 - *Armaments Cooperation; ^{AE18} Collaboration; ^{AE19} Competition; Cost and Affordability; Cost Realism; Cost Sharing; Financial Management; Independent OTAs; Information Assurance; Information Superiority;*
 - ^{AE20} *Integrated T&E; Intelligence Support; ^{AE21} Interoperability; ^{AE22} Knowledge-Based Acquisition; Legal Compliance; Performance-Based Acquisition;*
 - ^{AE23} *Performance-Based Logistics; Products Services and Technologies [seek ^{AE24} most cost-effective solution over the system's life cycle], Professional Workforce, Program Information [complete, current, tailored]; Program Stability; R&D Protection; Safety; Small Business Participation; Software Intensive Systems; Streamlined Organizations; Systems Engineering; ^{AE25} Technology Development and Transition; Total Systems Approach*
- AE26 AE27

Needed Systems Engineering Capabilities

(which M&S can affect; derived from Desired Acquisition Environment)

SE1. Early, continuing systems engineering from an SoS/FoS capabilities perspective; seamless transition from JCIDS to acquisition

(AE1-3,5,9-11,20,21,25,27)

SE2. Lifecycle-wide exploration of the maximum available trade space, including time-phased requirements and technology insertion

(AE1-5,7,10,11,13,19,23-27)

SE3. Collaboration among multiple organizations, Services & contractors for all key enterprise-level SE decisions (AE6-8,10,18,22,25,27)

SE4. Comprehensive, accurate, early assessment of designs; avoidance of costly fixes for problems discovered late in the acquisition process

(AE2-4,7,9,10,12-17,19,20,22,24-26)

SE5. Tighter decision cycles (faster design-assessment process)

(AE2,4,7,10,14,16,19,25)

SE6. More effective & efficient testing, including in a SoS/FoS environment

(AE1,2,4,5,9-11,13,15,19-22,25)

SE7. Appropriate reuse of all resources – information, software tools, expertise, facilities, ranges, etc. – across programs & organizations

(AE4,14,15,19,24,25)

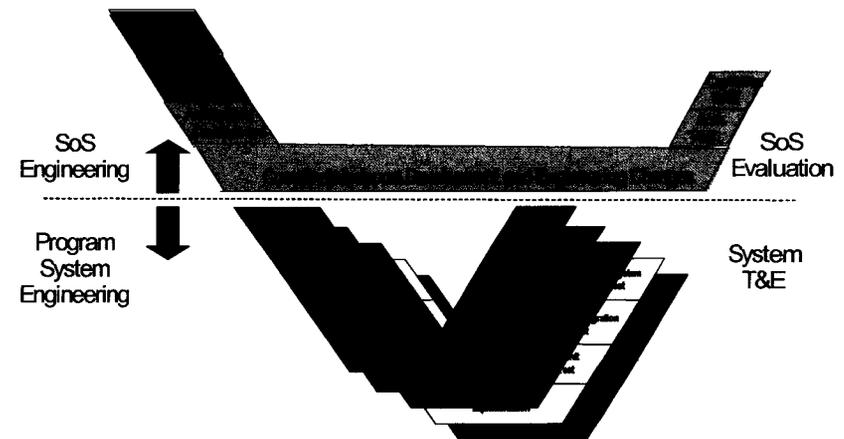
M&S Processes for Better Systems Engineering

(derived from Needed Systems Engineering Capabilities)

- MS1. Use of a model-based systems engineering approach (SE1,2,4)
(Emerging concept under INCOSE, OMG, etc.; growing suite of COTS SE tools)
- Use SE tool modeling environments to analyze reqmts and develop architecture; views linked to, and generated from, central database
 - Embedded simulation to verify the architecture and assess its merits
 - Automated generation of documents/reports

- MS2. Establishing M&S-enabled collaborative engineering environments
(SE1,2,3,4,6)

- Shared, authoritative information
- Interoperable modeling environments for architecting/design
- Simulations to assess/analyze
 - Option to immerse warfighters
- Distributed live-virtual-constructive environments for integration, verification, and test



- MS3. Model-Test-Model process to improve both M&S tools and testing (SE4,6)
- Increased M&S validity for credibility, cost, reuse/life-cycle benefits
 - Better test planning and understanding, credible surrogates

M&S Processes for Better Systems Engineering

MS4. Harnessing M&S knowledge to formulate an effective M&S strategy
(SE2,3,4,7)

- Access to SMEs, lessons-learned, info on reusable resources, etc.

MS5. Disciplined M&S planning and employment (SE2,4,5,7)

- Rigorous analysis of requirements, alternatives, best course
- Efficient configuration, initialization, execution and post-run analysis
- Lifecycle plan for sustainment and reuse

MS6. Efficient development/maintenance of credible M&S tools (SE2,3,4,7)

- A systems engineering approach and adequate V&V
- Broad, coordinated evolution of widely-used M&S tools

MS7. Access/sharing of authoritative data needed for M&S representations
(SE2,3,4,5,7)

- Reducing a major time and cost burden that inhibits M&S use

MS8. Inspection of M&S used to support acquisition decisions (SE2,4,7)

- Examine capabilities and limitations (VV&A) of M&S
- During lead-up to program reviews, OTRR's, etc.

Gaps & Needed Actions are Organized by Subject Areas

1. Management
2. Architecture / standards / technical framework
3. Model & simulation capabilities and use
4. Trustworthiness / VV&A
5. Sharing/reuse; protection of tools & information
6. Research / S&T / Tech Base
7. Business model / metrics & ROI / funding and incentives
8. Workforce shaping

Gaps (1 of 7)

1. Management

- G1.** Robust but confused landscape of M&S activities; no clearly designated leadership or effective coordinating mechanism (MS1-8)
 - Current EXCIMS ineffective; little coordination for capabilities/SoS/FoS
- G2.** Inadequate constancy of purpose because time to fix problems >> tour length; “DoD has an attention deficit disorder” (MS2-7)
- G3.** Gov’t acquisition guidelines don’t promote M&S use or reuse (MS1-6)
- G4.** No DoD requirement for formal M&S planning to support acquisition (other than T&E) (MS1-5)
- G5.** No contractual guidelines regarding M&S and the data it needs (MS1-8)
- G6.** Gov’t typically doesn’t give contractors meaningful M&S guidance (MS1,2,6,8)
- G7.** Most DoD M&S takes a project, vice an enterprise, approach (MS2,3,6,7)
- G8.** No consensus on value of integrated architectures, nor responsibility for (MS1,2)
- G9.** Managing distributed collaboration, needed for SoSE, is very hard (MS1-8)
- G10.** Public law precludes OT based solely on M&S, but no clear guidance on use for SoS/FoS T&E (MS2,3,5,6,8)

Gaps (2 of 7)

2. Architecture/standards/technical framework

- G11.** No standard modeling notation (like UML v2.0) for capturing full range of information critical to system engineering (e.g., structure, behavior, requirements hierarchy/traceability, test cases, verification results) (MS1,2,6,7)
- G12.** No standard for interchanging systems engineering information (same examples as above) (MS1,2,6,7)
- G13.** No conceptual framework (like Open System Interconnect protocol stack) for data interchange (MS1,2,3,6,7)
- G14.** Lack of agreement on a common distributed simulation standard increases complexity and cost, limits simulation interoperability (MS2,5,6)
- G15.** DoDAF v1.0 is difficult to use for architecting due to lack of data-centricity and executability; some products of marginal value (MS1,2,6,7)
- G16.** Use of DoD-unique standards limits their user base, quality, COTS tool support, and opportunities for reuse (MS1,2,5,6)

Gaps (3 of 7)

3. Model/simulation capabilities & use

G17. Many M&S tool gaps and deficiencies (MS1,2,3,5,7)

- What's modeled (e.g., unconventional warfare, comm networks, threats, logistics)
- Fidelity, granularity, interoperability
- Only limited consensus on common models to be used across a domain

G18. No good way to develop and maintain widely-needed M&S tools that cut across programs (MS5,6)

- Not incorporating mods by other organizations into "street version," etc.

G19. M&S developers, not M&S users, tend to drive M&S development (MS6)

G20. In general, architecture development (modeling) is lagging, not collaborative, and not exploiting COTS SE tools (modeling environments) (MS1,2)

G21. No readily-available distributed M&S infrastructure (e.g., JDEP) (MS2,5)

G22. Hard to get security certification for multi-organization distributed simulation) (MS2,3,5,6)

G23. Hard to get approval and security certification for M&S involving multiple compartmented programs (MS2,3,5,6,7)

Gaps (4 of 7)

4. Trustworthiness/VV&A

G24. Post-development model validation expensive and slow (MS2,3,5,8)

G25. VV&A often weak or non-existent; documentation inconsistent (MS2,3,5,8)

- Plans to use M&S to avoid testing costs often rejected due to poor/no validation

G26. VV&A usually not enforced and also not examined during program reviews (MS2,3,5,6,8)

G27. Models and sims often not updated to reflect empirical evidence (e.g., test results) (MS2,3,5,8)

Gaps (5 of 7)

5. Sharing/reuse and protection of tools & information

G28. Little reuse; only 7% of models & sims used on >1 program (MS2,5,6)

- True for both design and testing

G29. Concurrent engineering requires integrated culture, data & tool set, but <20% of programs have such a collaborative environment (MS2,7)

G30. Hard to discover reusable resources (software, info, services) (MS2,4,5,7)

- M&S repositories are not integrated, lack an effective search capability, and are mostly empty
- MSIAC knowledge/expertise is lacking

G31. Insufficient info (metadata) to evaluate data/reuse candidates (MS2,4,5,7)

G32. Hard to obtain reusable resources (MS2,4,5,7)

- Industry to gov't: To protect proprietary info & competitive advantage
- Gov't to industry: Contractual liabilities associated with GFE/GFI
- Gov't to gov't: Concerns about misuse; cost to deliver and guide

G33. No incentives to encourage reuse (MS2,3,5,6)

- Negative incentives include cost to make reusable, workload assisting users, vulnerability to criticism

[plus approval and security certification gaps 22 & 23 listed under M&S use]

Gaps (6 of 7)

6. Research/S&T/tech base

G34. Conceptual foundation of M&S weak (MS5,6)

- E.g., theoretical understanding of modern warfare, human behavior, relating M&S at different granularities, dealing with uncertainty, agent-based modeling and generative analysis

G35. Little acquisition community input to DoD S&T management regarding needed M&S-related research (MS2,5,6)

7. Business model, metrics & ROI, funding and incentives

G36. No business model for how M&S capabilities should be developed, used and maintained (MS1-8)

G37. Metrics are critical to keep interest and funding up, but metrics regarding M&S use and cost-effectiveness are inadequate (MS1-8)

- M&S funding difficult to identify; most embedded within other PEs

G38. Too little funding (MS2-7)

Gaps (7 of 7)

8. Workforce Shaping

- G39.** Body of knowledge for M&S support to acquisition is deficient, not managed (MS1,2,4-6,8)
- G40.** Acqn community managers and staffs mostly uninformed about M&S capabilities and limitations (MS1-8)
- Weak acquisition personnel understanding of commercial M&S activities (“We don’t get out enough”)
 - Not enough M&S specialists (no career path [except Army], no formal education or training)
- G41.** M&S developers lack understanding of modeling best practices, abstraction techniques, context dependencies, etc. (MS3,6)
- G42.** M&S users often not adequately trained (MS1,2,4,5,8)
- G43.** Insufficient M&S education options (MS2,4,5,6,8)

Needed Actions (1 of 7)

(a superset; those in gray font will likely be led by others, outside acquisition)

1. Management (1st of 8 areas; not in order of priority)

- A1.** Provide effective, persistent DoD M&S leadership & governance (G1,2)
 - To address cross-cutting M&S issues, coordinate actions
- A2.** Assign Capability Managers, with responsibility for FoS/SoS SE, including M&S (G4,8,9,20,29)
- A3.** Share information about M&S activities (G1,7,14,17,19,27,28,30,32)
- A4.** Promote the here-recommended eight M&S processes in DoDI 5000.2, Acquisition Guidebook, etc. (MS1-8,G3-5,9,10)
- A5.** Require documented M&S planning at capability & program levels as part of systems engineering (SEP) and T&E (TEMP) (MS5,G3-6)
- A6.** Promote appropriate use of M&S to plan/predict tests, to flesh-out system live tests, and to evaluate entire SoS/FoS (MS2,3,4,5,G10,21,22,25)
- A7.** Establish guidelines for M&S-related RFP language & contract provisions (G5,6,7,28-33,36)
 - To include stating specific M&S requirements and specific interfaces to existing models & simulations
 - Responsibilities and liabilities of both parties regarding reuse
- A8.** Coordinate and publish practical guidelines for security certification of multi-organization and multi-compartment M&S (G22,23,32)

Needed Actions (2 of 7)

2. Architecture/standards/technical framework

- A9.** Establish a framework for data interchange-related standards (G13)
- A10.** Establish a forum to clarify the pros and cons of various distributed simulation standards (HLA, TENA, DIS, SI3, etc.) (G14)
 - Encourage convergence
- A11.** Develop a product development information metamodel & associated metadata extensions to the DoD Discovery Metadata Standard (G24,25,31)
- A12.** Actively participate in development of useful open commercial standards, such as SysML and AP-233 (G11,12,16)
- A13.** Provide acquisition input to DoDAF v2.0 (G15)
- A14.** Rationalize DoDAF and CADM with their similar open, commercial standard counterparts under OMG and ISO (G11,12,15,16)
- A15.** Require a standard XML-based file structure to describe integrated architectures (G12)

Needed Actions (3 of 7)

3. Model/simulation capabilities & use

A16. Centrally develop and maintain high-priority, broadly-needed M&S tools (G17,18,19)

- Update existing tools to reflect empirical evidence (e.g., test results) and incorporate user-implemented enhancements/modifications
- Update existing tools, or develop new ones to realize the most important new capabilities
- Establish a process to identify and prioritize these needs

A17. Assigned Capability Managers should specify the M&S collaborative environment that individual system PMs must comply with & support (G1,7,17,18,21,28-30)

A18. Acquisition Guidebook should emphasize user identification of M&S requirements and encourage “use case” analysis approaches to satisfying these requirements (G17,19)

A19. Provide readily-available distributed live-virtual-constructive environments (G21)

- Flexibly link simulations, lab hardware & software, actual systems/forces

A20. Demonstrate/evaluate the use COTS SE tools for collaborative architecture development (G8,9,20)



Needed Actions (4 of 7)

4. Trustworthiness/VV&A

- A21.** Establish policies to require unambiguously stating the purpose, assumptions and limitations of each model/simulation when results are presented (G24-27,40)
- A22.** Establish guidelines (e.g., risk assessment, level of accreditation, traceability, life-cycle applicability) for VV&A expenditures (G24,25,38)
- A23.** Establish policies to require standardized documentation of VV&A (G25,26,31)
- A24.** Enforce VV&A when M&S informs major acquisition decisions (G26,40)

Needed Actions (5 of 7)

5. Sharing/reuse and protection of tools & information

- A25.** Establish DoD-wide policy for sharing and protecting system information and M&S tools (G3,5-7,17,28,29,32,33)
- A26.** Define what information, models and simulations each program will be obliged to provide to others with a valid need to know (G7,17,25,28,30,32,33)
- A27.** Establish a standard template of key characteristics/metadata to describe reusable M&S resources (G7,28,30,31)
- A28.** Establish a DoD-wide standard business model for compensating providers of reusable M&S resources (info, tools, services) (G3,7,17,28,29,32,33)
- A29.** Establish the means (e.g., directory service, repositories, bulletin boards) to discover existence of reusable M&S resources & contact info (G7,30,32)
- A30.** Establish standard method to request info/tools and appeal denials (G7,28,32)
- A31.** Improve the knowledge and expertise available through the MSIAC (G7,28,30,31)

Needed Actions (6 of 7)

6. Research/S&T/tech base

- A32.** Conduct research to improve M&S conceptual foundation (G34)
- E.g., theoretical understanding of modern warfare, human behavior, multi-resolution integrated families of models, dealing with uncertainty, agent-based modeling and generative analysis
- A33.** Establish a process to ensure acquisition needs are reflected in DoD M&S research priorities (G35)

7. Business model, metrics & ROI, funding and incentives

- A34.** Establish a DoD-wide standard business model for how M&S capabilities are realized and sustained (G1,7,17-19,21,28,32,33,36,38)
- A35.** Establish DoD and Service-level central investments to meet broad M&S needs and define how such needs will be identified and evaluated (G1,2,17-19,21,27,28,29,30,32,33,36)
- A36.** Define, and begin to capture, meaningful metrics for M&S utility in acquisition (G3,8,37,38,39,40)

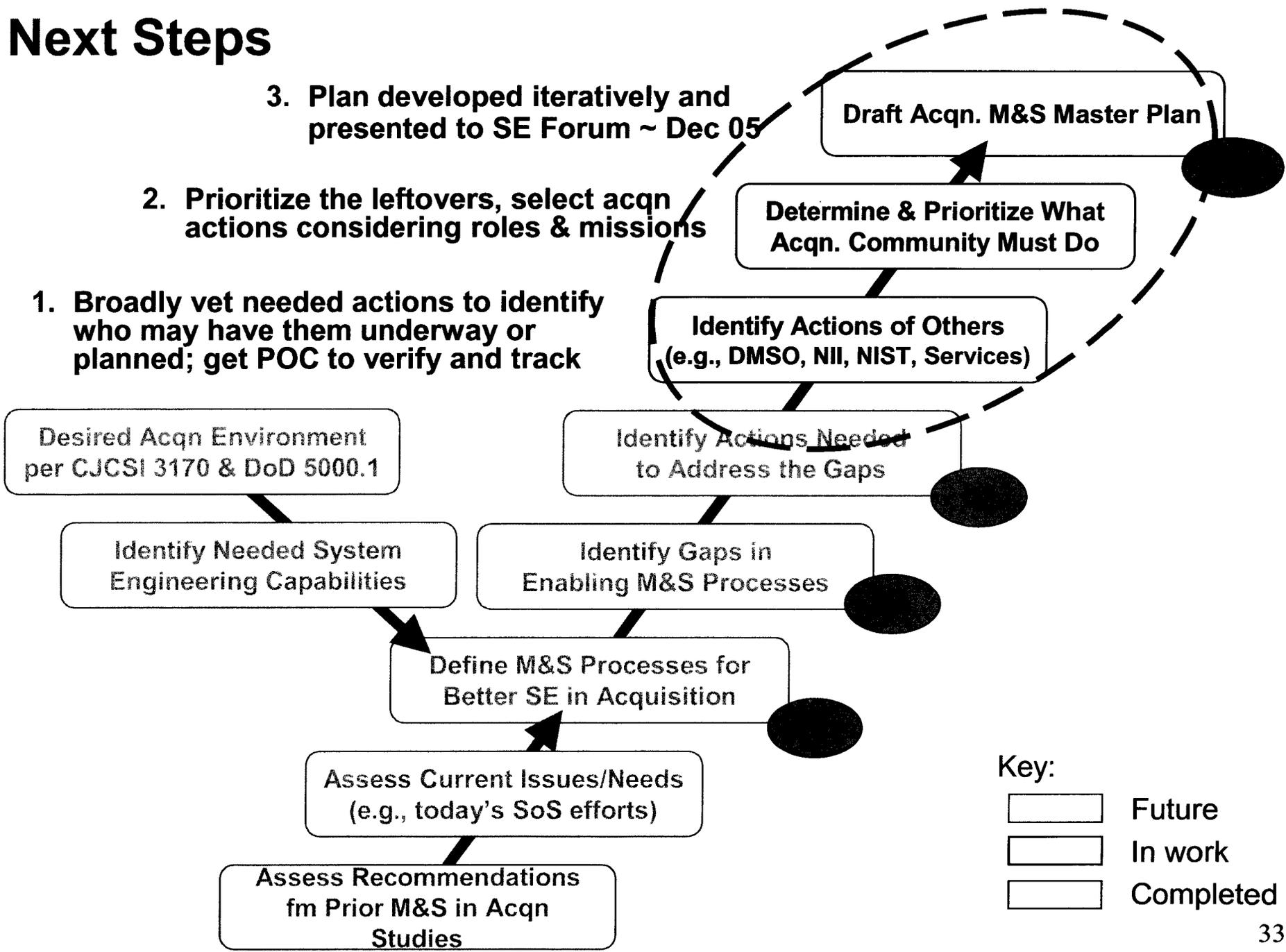
Needed Actions (7 of 7)

8. Workforce Shaping

- A37.** Establish effective M&S workforce management, to include formal requirements for M&S education (G40,42)
- A38.** Collect and enhance the M&S body of knowledge (G1,37-41)
- A39.** Improve DoD understanding of commercial sector activities/progress (G1,16,28,40)
- A40.** Further define and develop training materials for the here-recommended eight M&S processes (MS1-8,G39,40)
- A41.** Deliver this knowledge via an expanded set of DAU courses, PME, Acquisition Guidebook, on line CLM, conferences, workshops, assist visits, etc. (G43)

Next Steps

3. Plan developed iteratively and presented to SE Forum ~ Dec 05
2. Prioritize the leftovers, select acqn actions considering roles & missions
1. Broadly vet needed actions to identify who may have them underway or planned; get POC to verify and track



Key:

- Future
- In work
- Completed

Purpose (reprise)

- Review the purpose of the report
 - Provide the first 3 products we were tasked to deliver
 - These are building blocks for the Acquisition M&S Master Plan
 - Obtain consent to continue with next steps, which culminate in development of Acquisition M&S Master Plan
 - To be presented to SE Forum ~ Dec 05
- Examine our methodology
- Consider the deliverables and discuss any issues
 - Limited time at SE Forum will preclude detailed discussion of gaps and needed actions

Are we on the right vector?

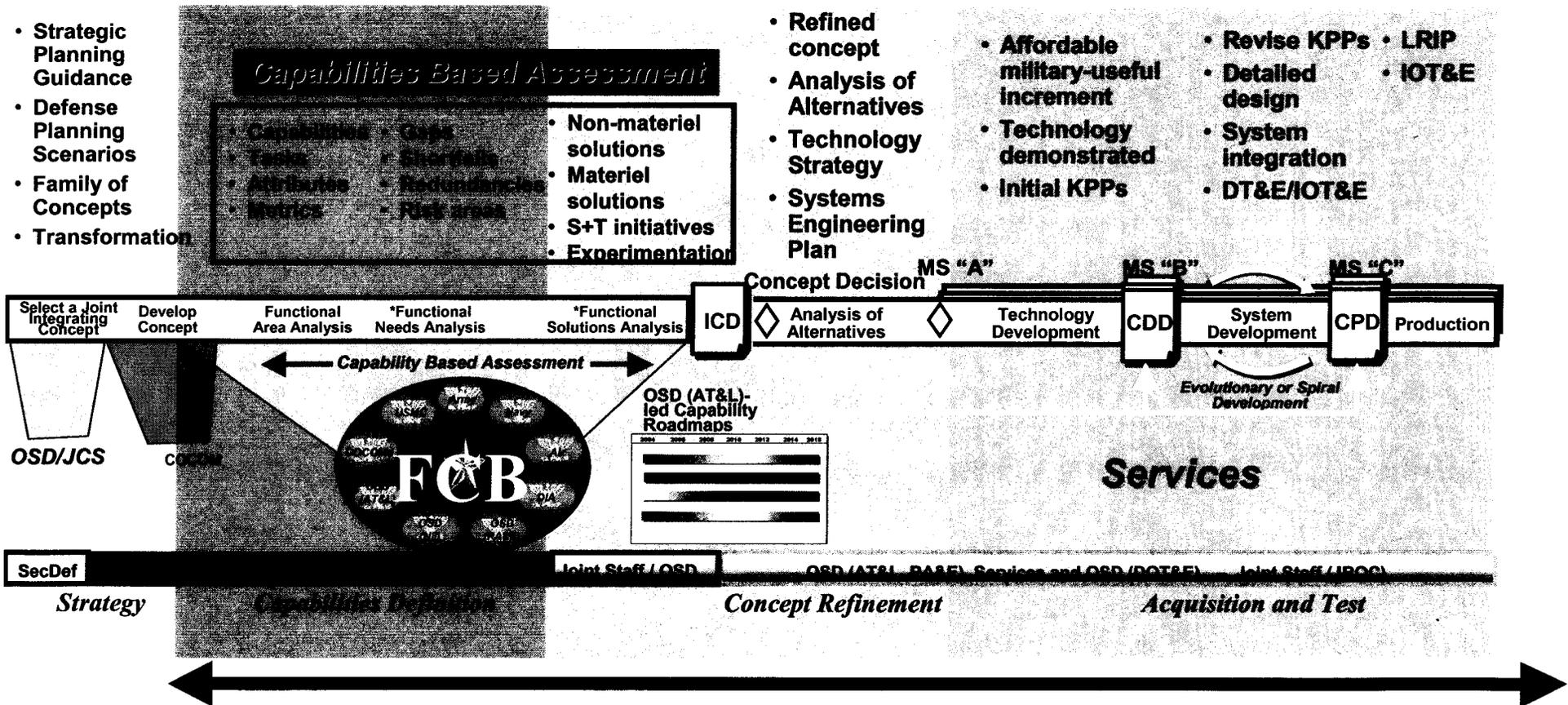
Back-Ups

AMSWG Participants

Allen, John	DOT&E	Gill, Jim *	DDFP/JTAMDO/CSC	Parmele, Truman	OASD/NII
Amick, Karl *	OSD(AT&L) LP&P	Gillis, John (ctr)*	ASA(ALT) RDA M&S	Pikul, Ronald	ASN RDA
Anderson, William	SEI	Glasow, Jerry	DMSO	Pittenger, Bill *	DISA/MITRE
Anthony, Marvin	NAVSEA 06P	Goerger, Niki *	USMA	Placanica, John *	NGA
Atkinson, Kenn	DMSO	Goode, Francine *	NSA	Preissman, Dan	NAVAIR
Badolato, Anthony *	SAF/ACE	Hardy, Dwayne *	OUSD(AT&L)DS	Prill, Mark *	NASA/ESMD
Bailey, Bruce (ctr)	DMSO	Hollenbach, Jim (ctr)	OUSD(AT&L) DS/SE	Prosnik, George *	DAU
Ball, David P.	Army G37/BCSE	Hutchings, Charles	NAVSEA	Roe, James W	AF AFMC/XRA
Barnabe, Dennis	NSA	Johnston, Jerald	JHU/APL	Sas, Robert	NCEE
Bilmanis, John (ctr)	Army G3/BC	Keener, Jim	IWS 1B% (NSWCDD)	Schmidt, Karl	NGA/LMC
Bunker, Paul	RDECOM TARDEC	Kelly, Doug	DIA	Shah, Nehal *	ASN(RDA) CHENG
Burris, William	TRMC	Kline, Tom	PEO IWS	Solosky, Tom *	DCMA
Butterworth, Robert *	DOTe	Lackner, Bob	PEO IWS IC/ ANTEON	Suter, Richard	OUSD (AT&L) (T&E)
Campbell, David	OSD(ATL)/DTRMC	Lee, Dona	Vitech Corp	Swift, Lloyd ctr	ASN(RDA) CHENG
Cianciolo, Lawrence	DCMA	Long, James	Vitech Corp	Tillery, Gordon (ctr)	OUSD(AT&L) DS/SE
Clark, Doug (ctr) *	DMSO	Mackoy, Rebecca	TRADOC	Tirres, Carlos *	DTRMC
Digman, Emmanuel	NSA	Manthei, Jerry	CNO N091/N912	Truelove, Michael(ctr)	OUSD (AT&L) DS/SE
Duesterhaus, Dave	DOT&E	Mathis, Thomas	RDECOM/SOSI Camber	Vaughn, Barbara *	ASN RDA CHENG
Eadie, J Marc *	NSWCPC(SOCOM AE)	Matzner, John	Army G-3/5/7/Alion	Walker, Oral	PMUA MSMO
Elliott, Steve	OUSD(AT&L) DS/MW	McDonnell, Joe (ctr)	RDECOM	Wallace Jim (ctr)	Army G37/BCSE
Espinosa, William	OPNAV N091	Merrill, Bruce	NSA	Wright, Susan	OSD DOT&E
Falkey, Mark *	JNIC/SY COLEMAN	Mitchell, Jeff	JHU/APL	Znachko, Carrall	SAF/AQIZ
Feinberg, Jerry (ctr)	MSIAC	Montoya, Matt	JHU/APL		
Friedenthal, Sanford	LMC	Myers, Fred *	OUSD(ATL)DS		
Furness, Zach (ctr)	MITRE	Nunez, Patrick	RDECOM TARDEC		

* Indicates SE Forum Representatives that are AMSWG Voting Members

Systems Engineering Region of Interest



JCIDS Methodology: "a collaborative process that utilizes joint concepts and integrated architectures to identify prioritized capability gaps and integrated DOTMLPF solutions (materiel and nonmateriel) to resolve those gaps." (CJCSI 3170.01C)

Wherever systems engineering is useful:

- Pre-acquisition (JCIDS gap and solution analyses, IA development, concept refinement, AOA)
- Acquisition through production
- Fielding, training & sustainment

How Can M&S Help?

- ❑ M&S allows a user to manage complex relationships and interactions to support the decision making process
 - Only approach scalable to typical levels of complexity and variability
 - Critical for both design and assessment/test
- ❑ Facilitates collaboration by providing digital representations that are easier to interchange, understand and use
- ❑ Provides a safe, secure and (usually) faster means to assess concepts and designs
 - Provides new insights, enables better decisions
 - Tighten the design-assessment cycle, save time/\$
 - Sometimes the only option for examining certain system attributes
- ❑ Enables better planning of live test events
- ❑ Can act as a surrogate for other systems to ease integration and testing
- ❑ Most practical means to assess capability areas/SoS's
- ❑ Provides a repeatable, defensible analytical underpinning for system acquisition decisions

Current Issues/Needs: What We Heard (1 of 2)

- ❑ M&S is essential at all levels and throughout system life cycle
- ❑ M&S leadership, coordination and funding are lacking
- ❑ Time to fix >> tour length; constancy of purpose = $f(\text{tour length})$
- ❑ Government has too many generalists, not enough specialists
- ❑ Metrics critical to keep interest up and dollars aligned
- ❑ Disconnect between what we say (in DoD 5000) we want (capability) and what we buy (systems)
- ❑ Collaboration is necessary to accomplish SoSE, but is extremely difficult
- ❑ Collaborative environment is helpful, but still hard and none DoD-wide
- ❑ Integrated architecture development is recursive, iterative and very complex; 10,600 architecture artifacts from one SoS program
- ❑ DoDAF problematic; Model-Driven Architecture a helpful alternative
- ❑ Technical framework doesn't make sense without an architecture

Current Issues/Needs: What We Heard (2 of 2)

- ❑ Distributed M&S infrastructure is needed; JDEP works
- ❑ Many competing distributed simulation standards
- ❑ Operational testers need to recognize and embrace M&S
- ❑ Sharing/reuse obstacles include financial disincentives, leadership, NIH, lack of awareness, weak skills/training, inadequate info
- ❑ Must protect proprietary information, preserve competitive advantage
- ❑ “We don’t get out enough” to leverage commercial efforts
- ❑ Lots of models and simulations on most programs; need commonality where it makes business sense
- ❑ No good way to maintain M&S that cuts across programs
- ❑ VV&A policy generally not enforced
- ❑ Hard to get security certification for multi-organization distributed simulation

ADP

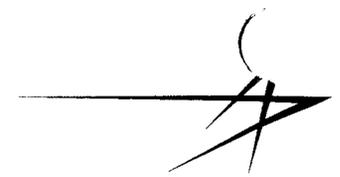


Acquisition Dilemma – Problem Statement

Frank Cappuccio VP & GM Shunk Works
July 15 2005



Topics



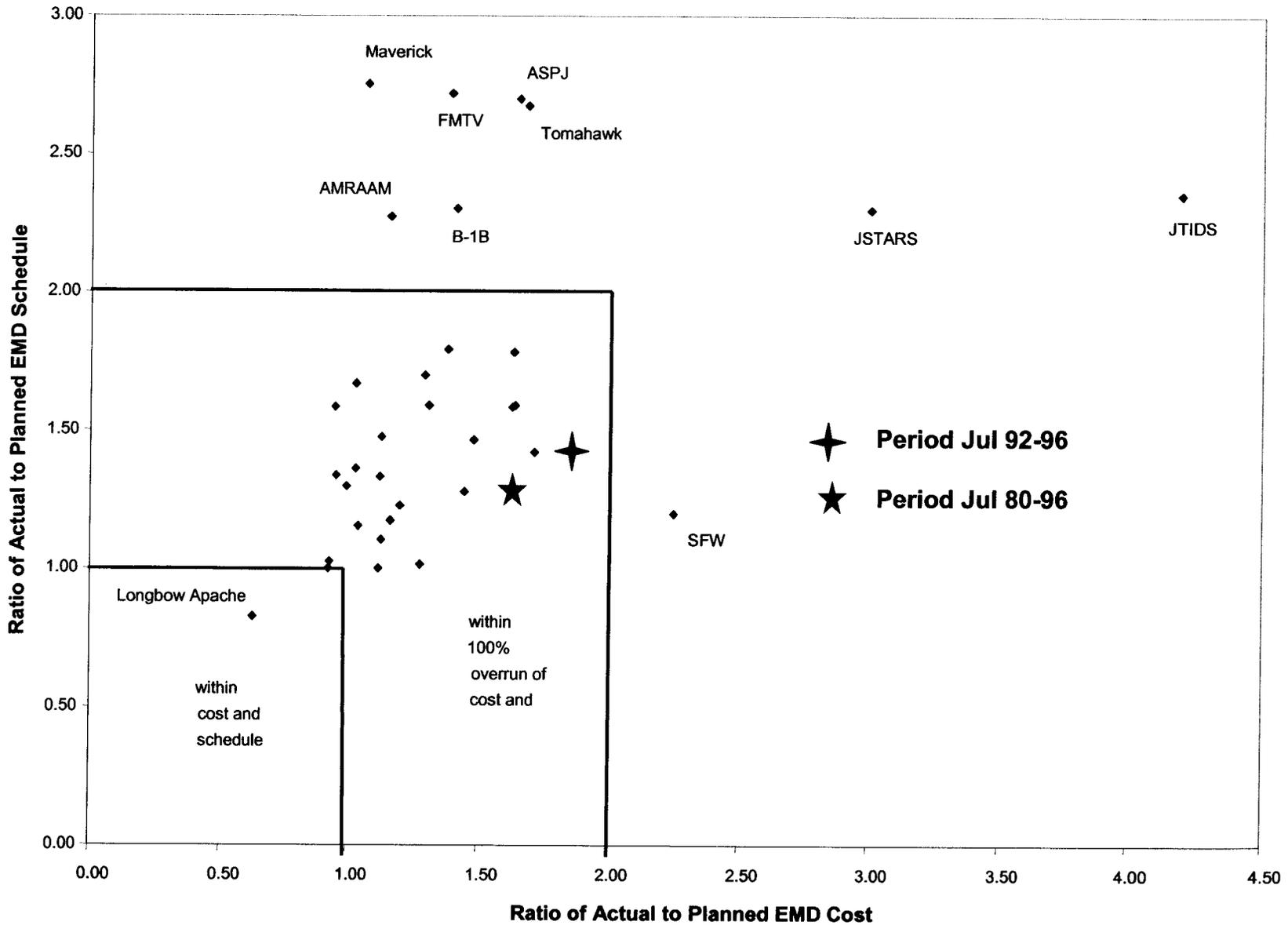
- **Problem Identification**
 - **Tenets For a Successful Program**
 - **Where we Go Wrong**
 - Acquisition Strategy
 - Proposal Process
 - Requirements
 - Competitive Bidding
 - Subcontract Management
 - Risk Mitigation
 - Staffing
 - Software
 - Poor Expectations
1. **Appendix A - Program Manager Attributes**
 2. **Appendix B - Leadership Attributes**
 3. **Appendix C - Program Activities**



Defining the Acquisition Problem - Performance



Ratio of Actual to Planned EMD Cost and Schedule





Defining the Acquisition Problem - People

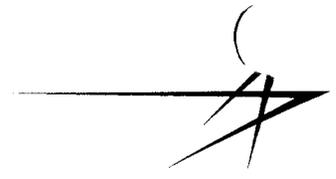
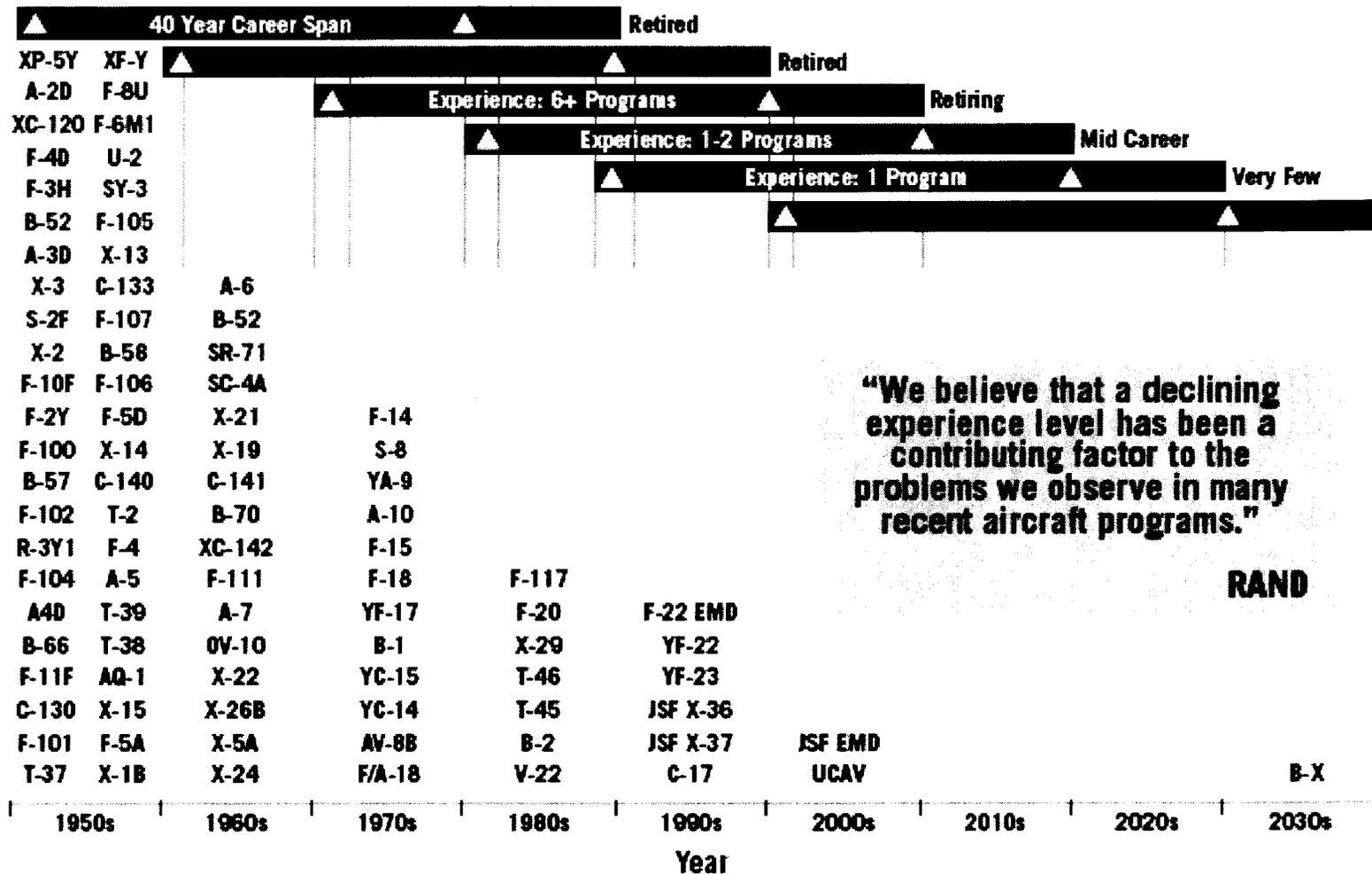


Figure 4-3 Declining Experience Levels in Military Aircraft Programs
(Vertical Bars: Military Aircraft Program Starts, Horizontal Bars: Typical 40 Year Career Span)



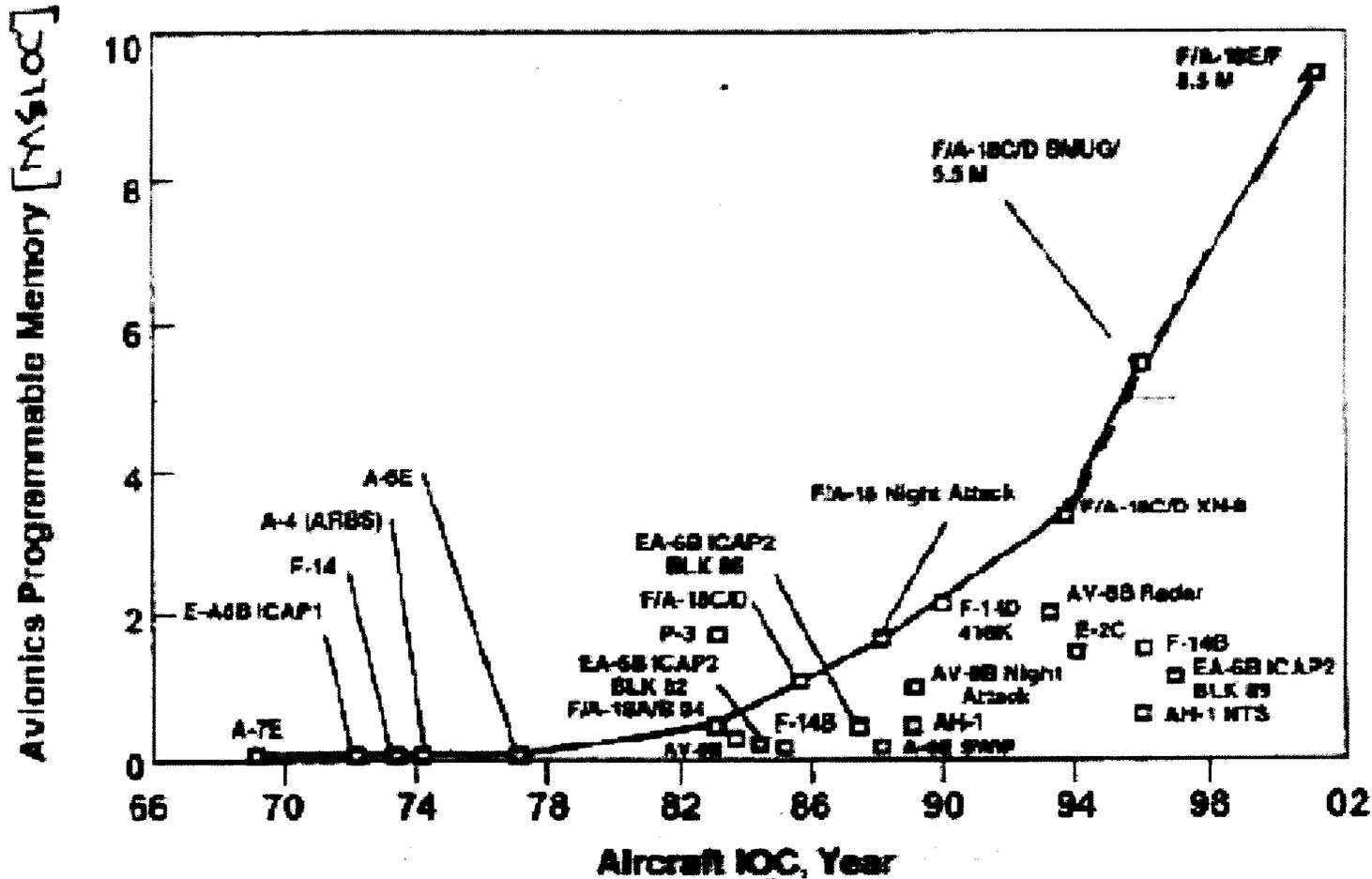
Source: RAND Study (Chart by Northrop Grumman, Aerospace Industries Association)



Defining the Acquisition Problem – Integration Risk



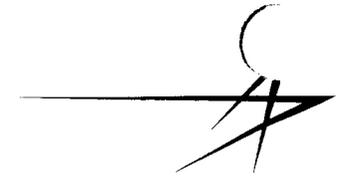
The Complexity of Our Systems has Grown and Thus has the Cost and Time Required for Integration Testing



SOURCE: RADM J. Dyer System Integration/Software Brief



Tenets For Successful Programs

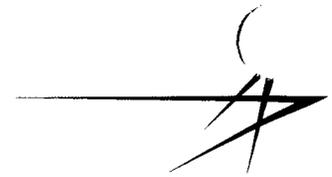


- **Program Manager Selection & Initiation** - Pick the “right guy” with the right attributes for this phase of the program.
- **Conversion of Expectations into Desired Capability** – the Process Whereby the Desired Capabilities are converted to System Requirements, Task Assignments, Organizational Span of Control, and Critical Program Milestones Resulting in an execution Philosophy.
- **Program Plans and Established Baselines**– Setting the goals, direction , requirements and strategy for program execution to cost, schedule & performance.
- **Integrated Schedules** – Synchronize the Program Plans to a master schedule based on interdependency of events and continuous “risk assessment” of critical path swim lanes.
- **Execute the Program** – the Management of a Program As It Moves From Phase to Phase of Its Particular Lifecycle.
- **Monitor and Control Program Execution** – the Review and Analysis of Critical Process Execution Data That Informs a Program Manager of the Health of Their Program and timely need for Corrective Actions.
- **Risk Mitigation** - Adopting a program attitude of early problem identification and retire risk ASAP with specific measurable action issue closure based defining success and measuring to it.

We Know the RecipeWhere do we go Wrong



Where We Go Wrong

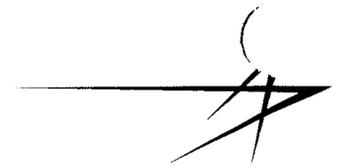


Acquisition Strategy

- **Establishing a Program Cost without a clear understanding of the “true” technical readiness of the effort against the requirements i.e integration risk not assessed**
- **Establishing too many KPPs vs a simple Weapons System Capability SOW**
- **Awarding contracts based on the “bidders price” vs the MPC and expecting the program to meet objectives**
- **“Under the Table” or No Management Reserve Strategy**
- **Inability for the program to “hold” the delta between MPC and the “bidder price” as a management reserve**
- **Releasing a “RFP” for competitive selection knowing it will change at contract award**
- **No requirement or specification that the weapons system must be “spiral capable” rather an assumption**



Where We Go Wrong



Proposal Process

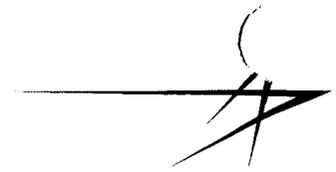
- **Proposal is ignored the day the contract is signed because in most cases because it was poorly structure i.e. Section “ L ” & “ M ” disjoint.**
- **Original Team on both sides either moves on or is stretched too thin during program ramp up so “ memory of why ” is lost. In addition, staffing contingency plans as it relates to schedule commentments not addressed early enough**
- **Industry has no cost incentives to hold people during the “ bridge period ” to contract Award.**
- **“ New ” customer enters the scene with “ lets get in right attitude ” & “ different, new and added capability is added to the program under the rationale that add it now “ while its cheap ” (Note : The impact to technical baseline, integrated schedules , requirements flow-down and associate SOW not revised).**
- **Industry likewise “ drags ” on there timely commitment of Inter-structure expenditures i.e. capital, IT etc , waiting until the “ win ”.**

capabilities are generally understood and or not addressed

- **The schedule risk assessment associated with the changes as related to contractual award dates , fees etc not addressed**
- **Technical Baseline losses configuration control**



Where we Go Wrong

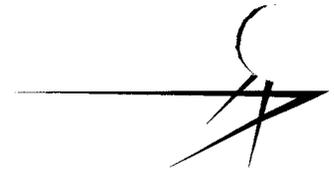


Competitive Bidding

- **In a cost competition the Tendency is to Bid a “20 / 80” price to win and further aggravate the situation by “carving out “ another 20% management reserve as well as not updating the program plans accordingly**
- **Vendor quotes at time of actual procurement order are higher than “proposal bids” obtained during cost proposal preparation with requirements creep being the explanation**
- **The Material Bill of Material at time of cost proposal is incomplete, due to lack of detailed design since estimates of what’s missed can’t be justified they are ignored**
- **BAFO’s/negotiations are something to give away the “store and management reserves”**



Where We Go Wrong

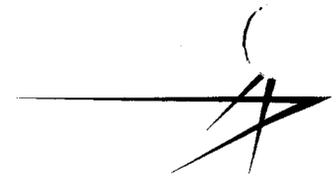


Subcontract Management

- **The proposal quotes reflect the system flowdown requirements at a point in time...change the requirement and cost out of bed at the get-go**
- **Failure to identify which subs are on the critical program path and defining contract teams consistent with this fact...standing army waiting for a screw**
- **Inadequate management of the subs particular in the software and test acceptance area**
- **Inadequate management and visibility into the subcontractors “subs”**
- **Not controlling the subs technical baseline but changing requirements as well**
- **Caliber of the subcontract manager for the task ... Project Engineer vs “buy-in”**



Where we Go Wrong

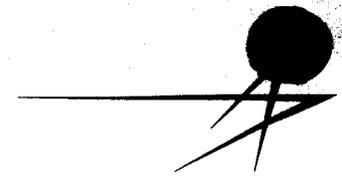


Risk Mitigation

- **Assuming having a risk process close or reduces risk**
- **Assuming that spending time and money against an event closes risk**
- **No establishing clear and measureable exit criteria as we move up the technology readiness levels**
- **Too much focus on the consequence of risk and not enough on contingency planning**
- **Not using the “float /slack” EVMS data as an early indicator of “new , as yet identified, risk elements**
- **Not using off the shelve tools like “risk +” to assess the program on a continuous bases**



Where We Go Wrong

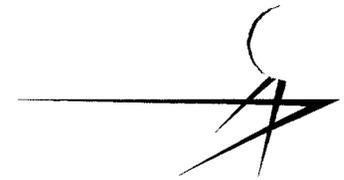


Staffing

- **Both Sides brings on new people which tear apart the fabric of the proposed program and in addition have staffing difficulties**
- **Industry PM usually stays while Government switch out. Selection in too many cases is based on “career” move on both sides**
- **Both sides tend to “ramp” up the wrong people too early i.e. “Designer / Avionics types” versus the “system” thinkers and program planners.**
- **Everyone want to believe they can” review” success into a program and elaborate program decks come into being ...earned value system a poor substitute for proactive management....have to study the data**
- **PM’s on both side adopt an inside / outside guy attitude in executing the program**
- **Government IPT change every two years**
- **No “chief engineer” on either side but reliance on the System Engineering Process**



Where We Go Wrong

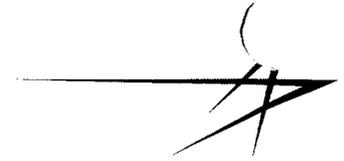


Software

- **Sizing wrong at Get –Go & Re-use Assumptions too optimistic**
- **Productivity Assumption too high**
- **Not enough assets (hardware, people) to support design, code, integration, de-bug procured early enough**
- **Inadequate Software testing and failure to test software modules as standalone..i.e. a fix on build 6 effect build 1-5**
- **20 faults per KLOC will occur, but never planned for (sound process gets many out early; weak process – customer finds them)**
- **System Architecture poorly emulated for performance, thru-put, interdependencies during the system trade studies ...**
- **Subcontractor Software managed poor and almost never integrate into the “system emulator”**
- **Lack of appreciation and or underestimation of the System Integration Readiness Level**



Where We Go Wrong

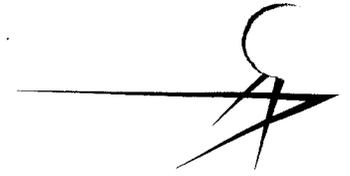


Poor Expectations

- Both Sides must demand more and take corrective action sooner
- All parties must recognize that all development programs are high risk ventures , have uncertainty and behave according.
- The interdependency of program events must be recognized and incorporated into the master schedule
- The program must manage to a Critical Path and associated IMS as well as the program must track the next two paths which are possible.
- Each Program Manager must adopt a “contingency” approach to issue resolution
- Risk Management must be proactive in driving program activities versus tracking events



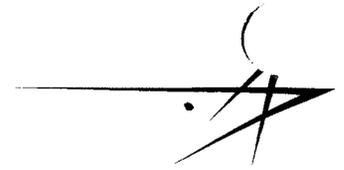
Appendix A



Program Manager Attributes



Program Management Attributes



- **Common Sense**
- **Aggressiveness**
- **Analytical Ability**
- **Resourcefulness/Creativity**
- **Planning Ability**
- **Decisiveness**
- **Dedication to Closure/Results**
- **Business Sense**
- **Interpersonal/Leadership Skills**



Program Management Attributes (cont'd)



Attribute

Characteristics

Common Sense

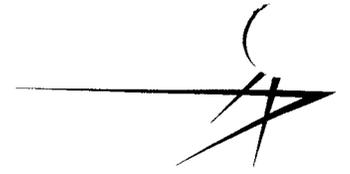
- Is pragmatic and exhibits good judgement.
- Distinguishes between what ought to be and what is.
- Learns from theirs and others mistakes and does not repeat them.
- Understands people's basic behavior.

Aggressiveness

- Readily takes the initiative/expresses opinions.
- Always finds some way to reach the goals that are set.
- Will go around bureaucracy to reach a goal.
- Denies special requests when appropriate.
- Never lets others stand in their way.
- Tough representative for their program with superiors.
- Controls their customer.



Program Management Attributes (cont'd)



Attribute

Characteristics

Analytical Ability

- Reads situations quickly.
- Thinks through and clarifies confusing problems.
- Quickly isolates the fundamental issues in a situation.
- Identifies shades of gray and alternatives.
- Thinks through the consequences of actions.
- Thinks independently.

Resourcefulness / Creativity

- Readily expresses novel sound ideas.
- Generates several alternate solutions to problems.
- Applies successful ideas and techniques from other contexts.
- Does not rely totally on old established methods.



Program Management Attributes (cont'd)



Attribute

Characteristics

Planning Ability

- Believes in the importance of an execution plan.
- Lays out logical well focused plans to reach goals (work, cost, schedule.)
- Understands the resources (people, facilities, equipment) needed to execute the plan.
- Proactively seeks out problems which could impede execution to plan.

Decisiveness

- Readily recognizes risk.
- Does not act impulsively, but analyzes risks to an appropriate level.
- Avoids over analysis.
- Accepts the trade-offs in most decisions.
- Makes decisions with appropriate timeliness.
- With equally undesirable outcomes, is willing to take a position, then work to make it succeed.
- Avoids procrastination.



Program Management Attributes (cont'd)



Attribute

Characteristics

Interpersonal/ Leadership Skills

- **Treats others straightforwardly.**
- **Displays versatile interpersonal skills to interface with a variety of individuals.**
- **Makes individuals feel part of a team.**
- **Takes the initiative to meet and interact with others.**
- **Listens to problems, suggestions, and other input.**
- **Communicates concisely and comfortably in groups and one-on-one situations.**
- **Understands the motives, strengths, and shortcomings of others.**
- **Accepts responsibility for failure.**
- **Shares successes.**
- **Uses a versatile style to influence others.**
- **Maintains solid relationships both internally and with customers.**



Program Management Attributes (cont'd)



Attribute

Characteristics

Dedication to Closure/Results

- Works quickly and with focus.
- Concentrates their efforts on productive activity which produces quality results.
- Effectively performs several tasks concurrently.
- Follows through on activities and problems to their closure.
- Dedicated to schedule achievement.

Business Sense

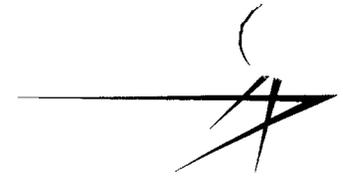
- Believes in the necessity of company profit.
- Feels obligation to make a committed program profit.
- Sensitive to importance of cost in a competitive environment.
- Readily understands the cost details of a program.
- Considers cost as a basic parameter in all trade-offs.
- Exercises good business judgment.

ADP



Leadership a Skunk Works Perspective

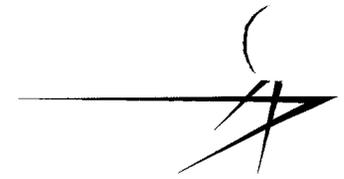
Frank Cappuccio VP & GM (Skunk Work)



“The Leaders I have Known, the Ones I Admire the Most were Those Who Consistently Placed the Programs Interest Above Their Own and in Doing so did not Regard Their Actions as a Sacrifice but Rather Service”



PM – Are Born Leaders

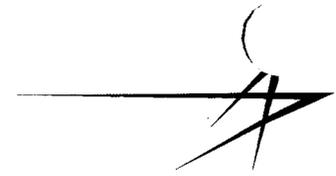


The Demonstrated Characteristics

1. **Vision** ... Looks Ahead, Forms Strategies & Shapes the Future.
2. **Conceptual Thinker** ... Deals With the Abstract & Yet Faces Reality
3. **Good Balance** ... Leadership / Management Skills– Hands-on/Hands-off.
4. **Ownership** ... Always Focused on What's Right for the Business & Can move from Strategy to Tactics to Tasks
5. **Strong People Orientation** ... Brings Out the Best in People ... Selects Well ... Deals With Non-Performers Communicates Well
6. **High Energy Level** ... Pro-Active...a Sense of Urgency and Closure.
7. **Strong Tech Marketing** Good Customer Skills & Comfortable in Using Them
8. **Integrity** ... Good for his “Word” & Accountable for his “Actions”
9. **Flexibility** ... Quick to Adapt to Change...Experiments...Innovates.
10. **Team Player** ... Recognizes that “people “ get the job done & embrace what they help to create



PM - Communicate Expectations

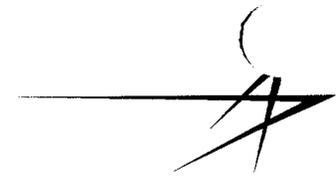


- 1. Open to New Concepts.....Accept and Manage Change**
- 2. High Integrity & Dedication Walk the Talk**
- 3. Able to Connect the Dots System Thinking**
- 4. Enormous Energy Loves Speed**
- 5. Self Confident But Not Arrogant**
- 6. Boundless Behavior Not Seeking Credit**
- 7. Avoids Bureaucracy Strives For Simplicity**
- 8. Self Starting A Zealot That Moves Out**
- 9. Innovative Strives for New & Competitive Solutions**
- 10. Prudent Risk TakerComfortable with Uncertainty**

Passion for Excellence

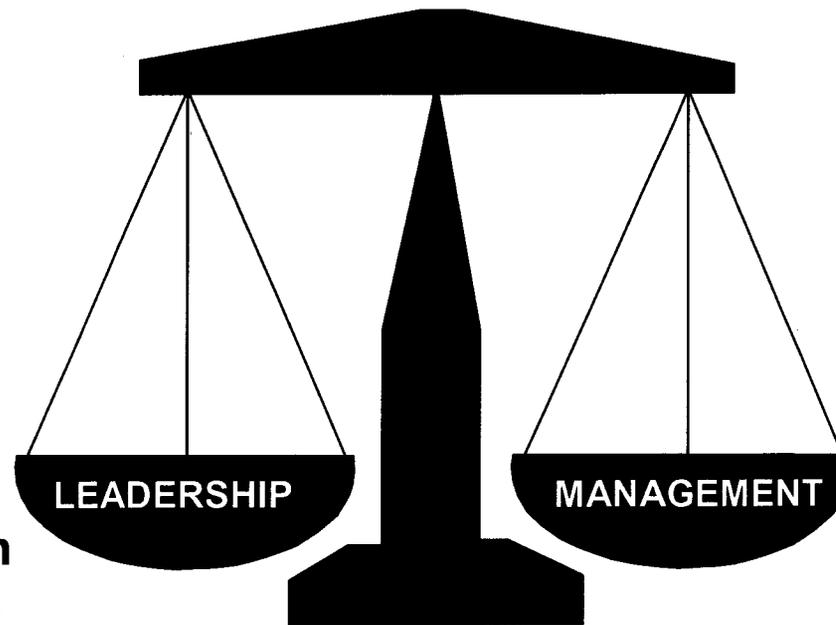


PM – Maintain Sense of Balance



Attitude

- **Initiate**
- **Resource Definition**
- **Doing Right Things**
- **People Skills**
- **Innovative**



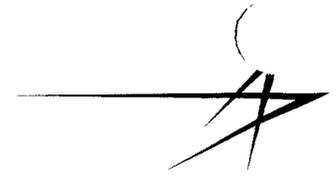
Activity

- **Control**
- **Resource Utilization**
- **Do Things Right**
- **Process Skills**
- **Maintain**

PM Must Achieve a Sense of Balance In the Execution of a ProgramBut Leadership Traits Tend to “Win the Day”



PM - Lead from Loyalty

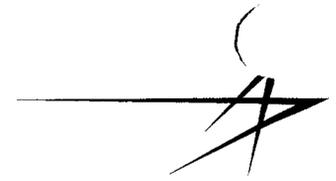


- **Preach What you Practice.**
- **Play to Win-Win.**
- **Be Picky**
- **Keep it Simple**
- **Reward the Right Results**
- **Listen Hard; Talk Straight**



Leadership for Loyalty

- Continued -



- **Preach What you Practice.**

It's not enough to have the right values. You must clarify them and hammer them home to customers, employees, suppliers, and shareholders through your words and deeds.

- **Play to Win-Win.**

If you are to build loyalty, not only must your competitors lose. Your partners must win.

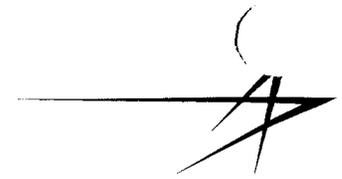
- **Be Picky.**

At high loyalty companies, membership is a privilege. Clarify the difference between loyalty and tenure.



Leadership for Loyalty

- Continued -



- **Keep it Simple.**

In a complex world, people need small teams to simplify responsibility and accountability. They also need simple rules to guide their decision making.

- **Reward the Right Results.**

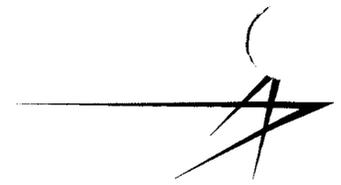
Save your best deals for your most loyal customers, and save your best opportunities for your most loyal employees and partners.

- **Listen Hard; Talk Straight**

Make it safe for employees to offer candid criticism. Only promise what you can deliver, and take conflict head-on in a professional manner.



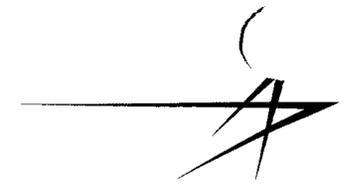
Ten Paradoxical Commandments of Leadership



- 1. People Are Illogical, Unreasonable and Self-Centered.
*Love and Trust Them Anyway.***
- 2. If You Do Good, People Will Accuse You of Selfish, Ulterior,
Motives.
*Do Good Anyway.***
- 3. If You Are Successful, You Win False Friends and True Enemies.
*Succeed Anyway.***



Ten Paradoxical Commandments of Leadership



- Continued -

- 4. The Good You Do Today Will Be Forgotten Tomorrow.
*Do Good Anyway.***

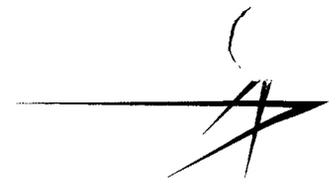
- 5. Honesty and Frankness Make You Vulnerable.
*Be Honest and Frank Anyway.***

- 6. The Biggest People With the Biggest Ideas Can Be Shot Down by
the Smallest People With the Smallest Minds.
*Think Big Anyway.***



Ten Paradoxical Commandments of Leadership

- Continued -



7. People Favor Underdogs but Follow Top Dogs.

Fight for a Few Underdogs Anyway.

8. What You Spend Years Building May Be Destroyed Overnight.

Build Anyway.

9. People Really Need Help but May Attack You If You Do Help Them.

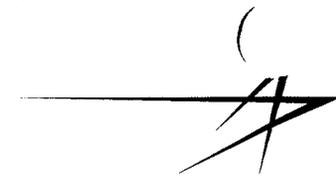
Help People Anyway.

10. Give the World the Best You Have and You'll Be Disappointed.

Give the World Your Best Anyway.



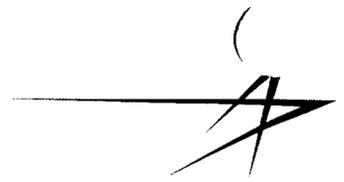
Final Thought



- **Solving the wrong problem never produces the correct results**
- **Remembering that people embrace what they help to create**
- **Not Mistaking the Edge of a Rut for the Horizon**
- **Ensuring that the needs of the program supersedes the aspirations of any individual**
- **Striving for approximately correct instead of exactly wrong**
- **Understanding Schedule is Sacred**



(



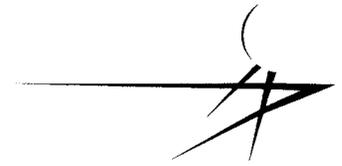
Program Activities

(Necessary First Steps/Requirements)

- Program Plans i.e. **Program Management Plan**
 - Resource Requirements (Staffing Plans, IS&T Project Requirements, Facility Requirements)
 - Product Specifications
- ***Establishment of the Core Integrated Program Team Required to More Fully Analyze the Program Requirements and the Organization Required to Execute It***



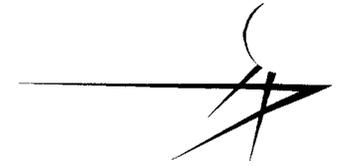
Establish and Maintain LM & Customer Stakeholder Expectations



- **The Activities Undertaken by a Program Manager to Establish the Performance Expectations for Their Program and Management of Those Expectations for the Life of Their Program**
- **Several Stakeholders Must Be Supported Through this Process**
 - ***External Customers (End Users, Acquisition Agencies, Legislative and Regulatory Agencies, Etc...)***
 - Communicate With and Establish a Relationship to Assess Product Performance, Product Improvement and Future Business Opportunities
 - Provide Timely Program Status Information and Assurance That Program Delivery and Product Performance Objectives Will Be Met
 - ***Internal Customers (LM Corporate and LM Aero Management)***
 - Like the External Customers, Provide Program Status Information and Assurance That Program Objectives Will Be Met
 - ***Employees***
 - Provide Program Direction and Decisions
 - Assess Organizational and Individual Performance and Reward or Take Corrective Actions Necessary to Achieve and Maintain Required Levels
 - ***Suppliers***
 - Establish the Working Relationship That Fosters the Teamwork to Achieve Program Objectives
 - Monitor Performance and Engage the Right Level of Supplier Executive and LM Aero Management to Resolve Issues Before They Impact Overall Program Performance



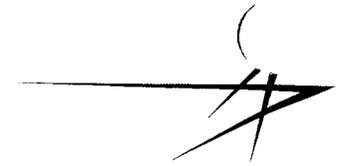
Plan and Baseline the Program



- **The Activities That Should Occur Prior to Program Award and Those Required to Maintain the Program Baselines**
- **The Activities in This Process Include:**
 - ***Development or Completion and Approval of the Various Plans to Manage the Program Such As:***
 - Program Management Plan
 - Integrated Master Plan
 - Systems Engineering Plan
 - Software Development Plan
 - Configuration Management Plan
 - Subcontract Management Plan
 - ***Establishment of the Performance Management Baseline for Cost Control***
 - ***Development of the Integrated Master Schedule , Associate Interdependencies Consistent with the Program Plan and “Risk +” Schedule Assessment***
 - ***Establishment of the Product Technical Baseline Consistent with the Program requirements***
 - ***Risk Mitigation Plans to the Baseline***
 - Technology Readiness Assessment
 - Integration System Readiness Assessment
- **Management Reserve & Distribution Plan**



Execute the Program



- **Activities in the Process Include:**
 - ***Management of the Activities Accomplished for the Review and Approval of Product Development Milestones Such As:***
 - System Requirements Review
 - Preliminary Design Reviews
 - Critical Design Reviews
 - Production Readiness Reviews
 - ***Management of the Transition of the Product Through the Development Lifecycle***
 - Program Initiation to Design
 - Design to Production
 - Production to Support
 - ***Collection and Management of Risk Issues***
 - ***Review and Update of Management Plans to Maintain Plan Currency with Program Objectives, Organizational Structure, and Contractual Requirements***



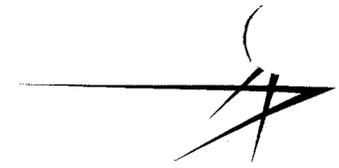
Monitor and Control Program Performance



- **Activities of This Process Include:**
 - ***Collection, Tracking, and Close-out of Action Items***
 - ***Monitoring of Program Metrics***
 - Understand the Interdependency of Program Events
 - Establish a “ Critical Path” & “ Float / Slack” Criteria
 - ***Establishment of Management and Control Review Boards for the Program Such as:***
 - Risk Management Board
 - Change Control Board
 - Requirements Management Board
 - Subcontractor Reviews Board
 - ***Development of Contingency Plans***
 - Look Ahead 30 Days
 - Assess Situation
 - Generate “ what if “ plans



Make Program Decisions

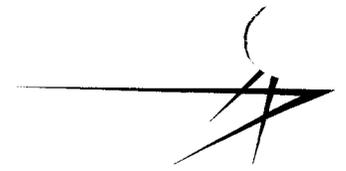


- **The Activities of This Process Include:**

- The Collection of Management Information to Identify Actions to Be Taken to Ensure Program Execution
- Providing the Delegation of Decision Responsibility to the Appropriate Level of the Organization
- Providing an Escalation Path for Decisions Requiring Additional, Higher Level Review and Approval
- Providing a Communication and Coordination Process for Dissemination of Program Decisions
- Attacking Problems at first Sight
- Avoid Re-baselining but if you must Address the Following
 - *You do not know what is going on*
 - *You know what is going on but cannot manage*
 - *You know what is going on, can manage but not being “quite” honest*



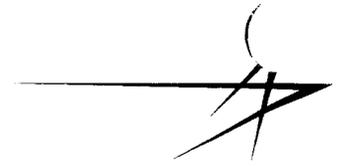
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Management Reserves



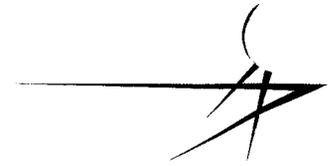
Management Reserves



- **Four categories**
 - a) Known problems and identified tasks***
 - b) Known unknowns***
 - c) Unknown unknowns***
 - d) Things you thought were o.k., but turn out to be wrong***
- **You need budget reserve (resources and time) to cover all four not to mention**
- **Real Reserves of 10 – 20 % or more are appropriate for development program**
- **Every contract change is a chance to build program reserve; both parties should knowing use the opportunity**

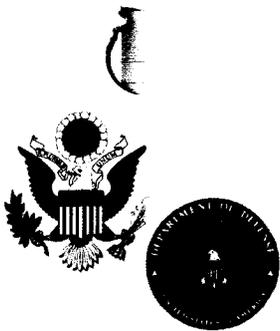


Reserves/Risks (cont'd)



- **When Management Reserve is created, make sure you**
 - 1. *Adjust the Program Plan According***
 - 2. *Get Buy-in at the IPT Level that the schedule can still be met***
 - 3. *Careful the “extract” the reserve such that the Critical Program Path is NOT impacted***
 - 4. *Have a Strategy for distribution***
 - 5. *Share the plan with the Government Counterpart***

- **Management reserve is principally for major, unexpected events (c & d above)**
- **Effort should be applied to build reserves**
 - a) *Sustained underrun by a group***
 - b) *Material cost underrun***
 - c) *Deletion of elements of work initially planned but determined to be unnecessary***
 - d) *Reserve from cost bearing contract changes prior to issuing change budgets***
- **While risks in theory should be owned by the program, be certain that only one person is accountable for resolving each risk item**



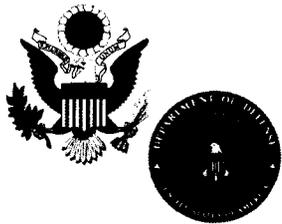
Defense Acquisition Performance Assessment Project Overview

presented to

Maj Gen Hoffman

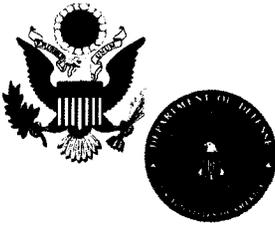
SAF/AQ

24 August 2005



Roadmap Defined

- **Point “A” to Point “B”**
- **Point “A”**
 - **Current Acquisition System and Processes**
 - **Informed by All the Past and Present Acquisition Reform and Improvement Initiatives**
- **Point “B”**
 - **Provide capabilities to:**
 - **Win the GWOT**
 - **Meet other challenges to National Security**
 - **Regain senior leadership confidence.**



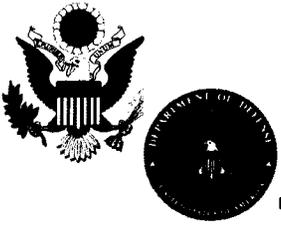
Mandate for Success

**Issued by Acting Deputy Secretary of Defense England,
7 June 2005**

“... I am authorizing an integrated acquisition assessment to consider every aspect of acquisition, including requirements, organization, legal foundations ...decision methodology, oversight, checks and balances — every aspect...”

The output... will be a recommended acquisition structure and processes with clear alignment of responsibility, authority and accountability.

Simplicity is desirable... restructuring acquisition is critical and essential.”



DAPA Leadership

SENIOR ACQUISITION EXECUTIVE WORKING GROUP

Mr. Skip Hawthorne (OSD)

Claude Bolton (Army)

Blaise Durante (Air Force)

John Young (Navy)

Frank Anderson (DAU)

DAPA Project Leadership

Dave Patterson, Director

Eileen Giglio, Deputy Director

Col Alan Boykin, Director of Staff/DFO

Primary DAPA Panel Members

Ron Kadish, Chair

Gerald Abbott (NDU)

Frank Cappucio (Lockheed-Martin)

Richard Hawley (Consultant)

Don Kozlowski (Consultant)

Alternate DAPA Panel Members/Advisor

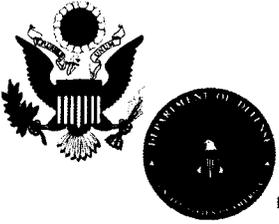
Linda Brandt (NDU)

Judy Stokley (AAC)

Francis A'Hearn (NDU)

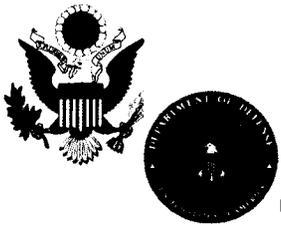
Al Hutchins (Consultant)

Mark Lumb, Advisor (DAU)



Guiding Principles

- **Win GWOT by acquiring equipment, systems and services in timely manner**
- **Understand and define success in terms of outcomes and in the context of the process that produces successful results in the customers' eyes**
- **Build the strategic human capital of the defense acquisition workforce**
- **Establish joint requirements that balance among performance, schedule and cost**
- **Work through the industrial base challenges of our day**
- **Ensure the acquisition process is transparent, objective, timely and accountable**
- **Build authoritative data / information (facts) – linked across functions – to drive decisions at the right level**
- **Increase agility, keep pace with a changing and uncertain world – shorten cycle times; hedge against surprise, etc.**
- **Explicitly and honestly balance risks and priorities to get best value for taxpayer**
- **Integrity – we must merit and maintain trust and confidence**



Problem Statement (Current Situation)

Massively Accelerated Cost Growth

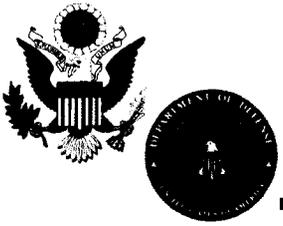
- Over 80 new MWS under development, with a combined cost growth of \$300B and total acquisition cost of nearly \$1.5T
- Most recent GAO study of 26 major acquisition programs indicates 42% cost growth to \$145B RDT&E, 50% average program unit cost growth, and 20% average program schedule increase to nearly 15 years
- GAO asserts that the top five programs have increased in cost during the past four years from \$281B to \$521B

System-Wide Improvement Elusive Despite Many Attempts

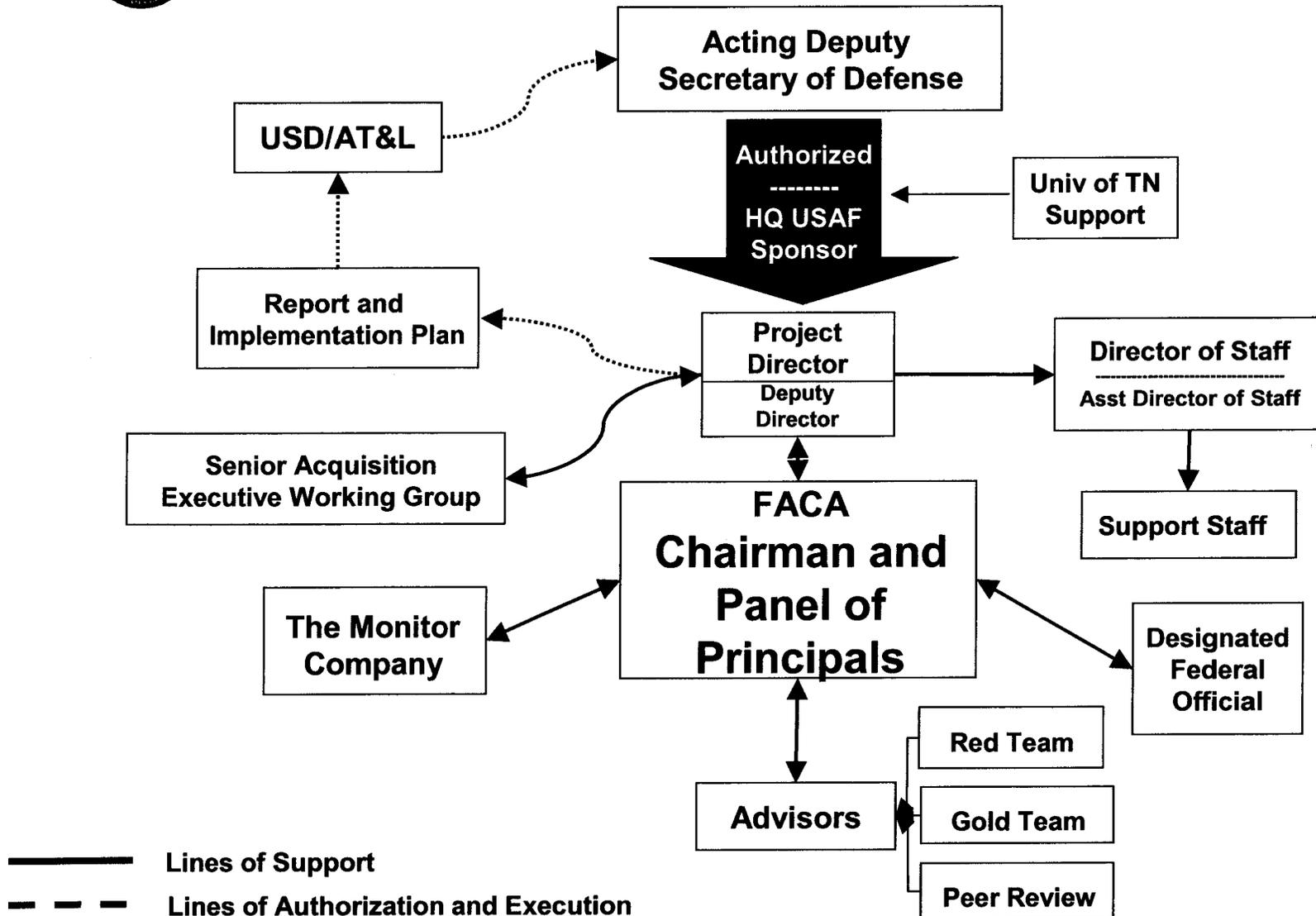
- The trend is not abating — estimates of cost growth and development time of these same five programs grew 14.3% and 5.5%, respectively, in the past year alone

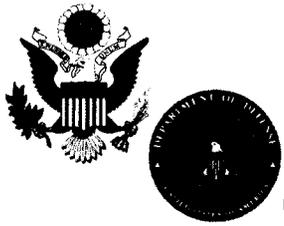
Confidence in System Badly Damaged

- Characterizations of system failure are wide, and many:



DAPA Relationships





Project/Panel Division of Responsibilities

Panel Principals

Study Areas

Ron Kadish

Don Kozlowski

Frank Cappuccio

Richard Hawley

Gerry Abbott

Paul Kern

Acquisition Program Management, Decision Making Methodology, DoD-Industry Relationship and Planning Processes, Implementation Plan

Pre-Acquisition Planning, Acquisition Strategy Development, Requirements Management, Oversight (Checks and Balances)

Organization – Acquisition Task Alignment, Program Manager Training, Certification Processes, Regulatory Policy/Legislative Impacts

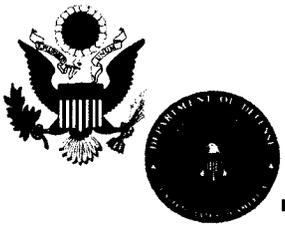


Methodology

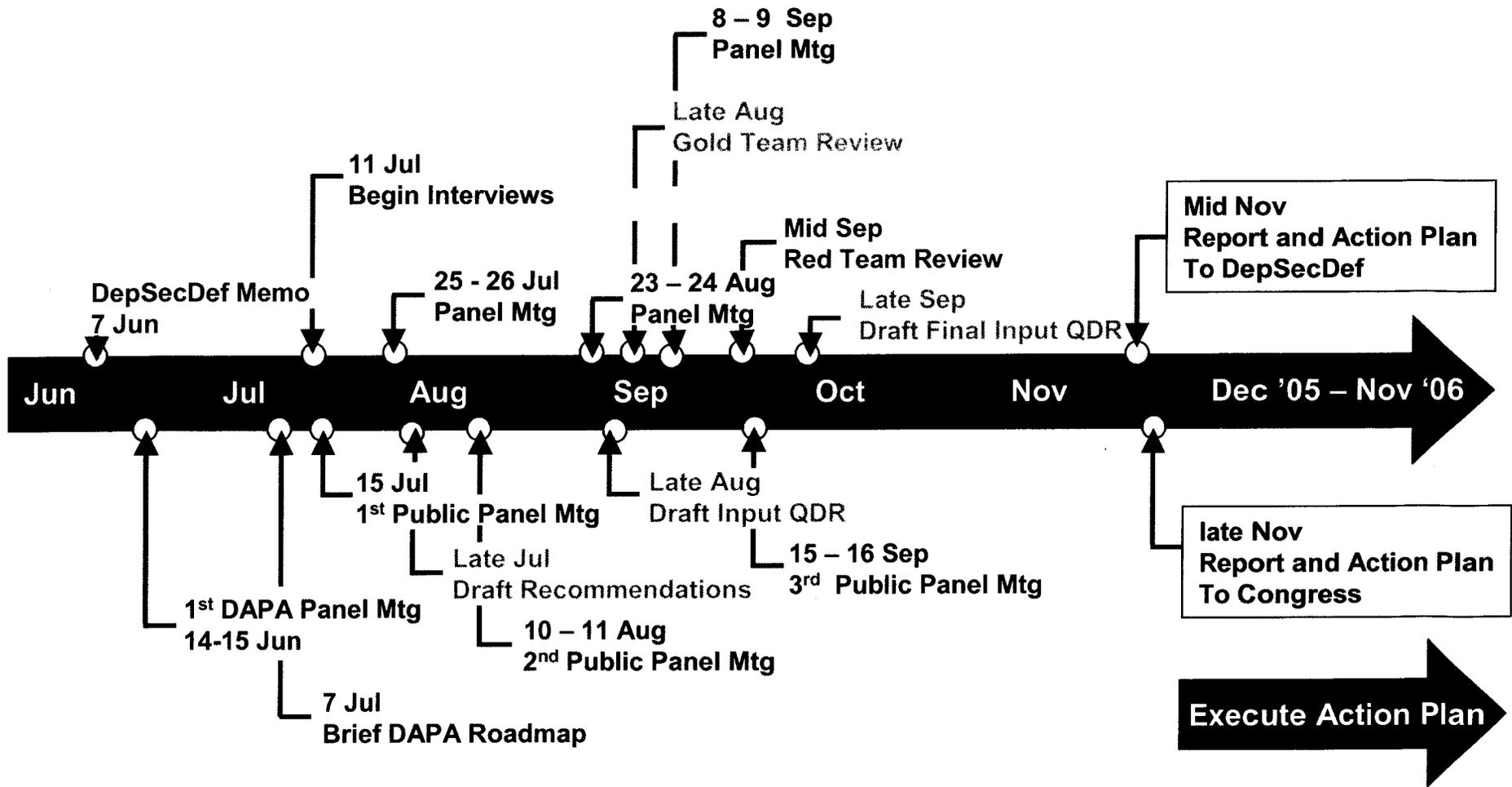
Five Element Approach

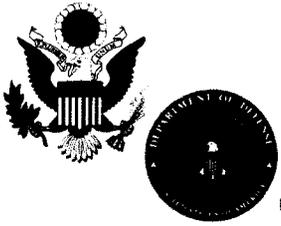
Qualitative Assessment, Analysis, Review and Implementation

- Literature Search (The Monitor Group – Harvard Business School)
- One-on-One Oral Interviews and Analysis
- Views of Knowledgeable Experts (Red Team, Gold Team, Peer Review)
- Implementation Plan
- Comprehensive Reviews at Critical Milestones



DAPA Project Accomplishment Timeline





DAPA Project Updated Roadmap

To Date...

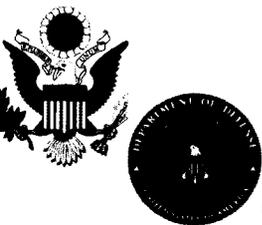
- ✓ Literature Search complete (Monitor Group)
- ✓ Informational Briefs (DAU, Services, Joint Staff, OSD, CSIS, BENS, BAH, Industry)

Ongoing...

- ✓ SMEs Providing Data
- ✓ Industry Day Theme Continues for Next Public Meeting (17 Aug 05)
- ✓ Interview Questionnaire & Survey Nearing Completion 19 Aug. Analysis of Data 26 Aug.
- ✓ Draft Recommendations

Standing By...

- ✓ Gold Team Review – DAPA Panel observations to be provided in advance and one day meeting with Panel to discuss- TBD.
- ✓ Red Team Review – DAPA Panel solutions to observations to be provided in advance and one day meeting with Panel to discuss-TBD.



Remaining Meeting Dates

DAPA (Open) – 23 Aug 05, 0900-1300 (1560 Wilson Blvd)

DAPA (Closed) – 24 Aug 05, 0800-1700 (1560 Wilson Blvd)

HASC/SASC-7 Sept, TBD (Capitol Hill)

SAEWG – 7 Sep 05, 1000-1100 (SAF/AQ Conference Room)

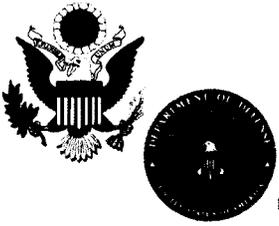
DAPA (Closed) – 8 & 9 Sep 05, 0800-1700 (1560 Wilson Blvd)

HASC/SASC-12 Sept 05, TBD (Capitol Hill)

SAEWG – 12 Sep 05, 1000-1100 (SAF/AQ Conference Room)

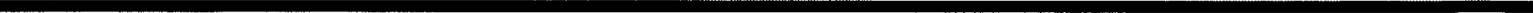
DAPA (Open) – 15 Sep 05, 0900-1600 (1560 Wilson Blvd)

DAPA (Closed) – 16 Sep 05, 0800-1700 (1560 Wilson Blvd)

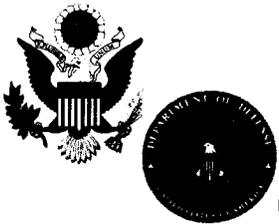


Summary

- **Structured Analytical Approach**
- **Addresses All Areas of Acquisition**
- **Study Results Will Inform QDR Process with Implementation Plan**
- **On Track with Aggressive Schedule**
- **Public Panel Meetings Key Element of Effort**



BACKUP



What's Different?

An analytical foundation is required to reform the acquisition system with predictable and lasting outcomes.

PRIOR STUDY APPROACHES

Delphic Approach

- Intuitive and inductive reasoning as to root causes of issues and challenges of acquisition system
- Based on in-depth interviews and panel discussions with experts across a stakeholders
- Recommendations typically address symptoms instead of the underlying structure of behaviors
- Typically used by think tanks such as RAND, CSIS, et. al.

Comparative Approach

- Assess performance on quantitative metrics (e.g. cost growth and schedule delays) and formulates root cause hypotheses based on comparison to other standards
- Hypotheses are rarely tested with fidelity
- Typically used by oversight and audit organizations such as GAO, CBO, et. al.

DAPA STUDY APPROACH

- Analytical Systems Approach and Framework
- Maps underlying structure of behaviors and develops insight into levers to affect change and manage uncertainties
- Allows us to test hypotheses, predict outcomes of actions, and identify unintended consequences and barriers to adoption
- Enable us to take actions for enduring and meaningful change
- Based on systems dynamics and other proven tools
- Causal relationships and patterns of behavior are informed by in-depth interviews
- Recommendations typically address the root causes of poor performance and barriers to change



Methodology

Five Element Approach

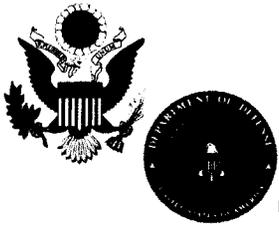
Qualitative Assessment, Analysis, Review and Implementation

- Literature Search
- One-on-One Oral Interviews and Analysis
- Views of Knowledgeable Experts
- Implementation Plan
- Comprehensive Reviews at Critical Milestones

**Peer Reviews
At
Critical Assessment
Project Milestones**

1. Literature Search

- Contracted to The Monitor Company (Harvard Business School)
- Objective
 - Independent/unbiased Perspective
 - Goldwater – Nichols NOT Baseline
 - 1985 Forward
 - Provide Summary of Past Acquisition Reform Work as **FACTUAL** Foundation for Current and Future Work and to Inform the QDR



Methodology

– Tasks Required

- Catalog All Major Past Acquisition Reform Studies and Initiatives
- Review Salient Literature: Books, Articles, Reports, Memoranda, Presentations and Other Publications
- Review of work drawn from : DoD and Its Agencies, GAO, CBO, CRS, Non-profit Public and Defense Policy Institutions (CSIS, IDA), Universities and Other Academic Institutions, Aerospace and Defense Companies and Consulting Firms; and Industry Associations and Professional Groups (BENS)
- Assess Actions Taken to Implement the Initiatives Reviewed.
- Summarize Lessons Learned
- Provide Analysis and Recommendations Based on Literature Search

2. One-on-One Oral Interviews and Analysis

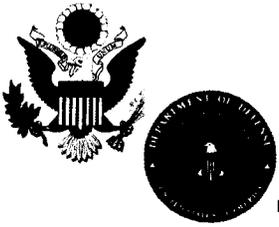
- Interviews with Selected Industry, Labor Union, Trade Associations and Government Acquisition Representatives



Methodology

2. One-on-One Oral Interviews and Analysis (cont.)

- Interview Subjects – Program Managers, Business Resource Executives and Other Subject Matter Experts
- Industries:
 - OEM Program Managers - Boeing, Lockheed, General Dynamics, Northrop Grumman, BAE SYSTEMS, Raytheon
 - Other Markets – Software, IT Network Providers
- Labor Unions
 - UAW
 - IAM
 - SPEEA
- Trade Associations – AIA, NDIA, BENS etc.
- Key Government Executives
 - DoD Acquisition Leadership
 - Congressional Subject Area Experts



Methodology

3. Views of Knowledgeable Experts

- Briefings to the Panel
- Correspondence and Discussions Provided to the Panel

4. Implementation Plan

- Assessment and Vetting of Recommendations
- Identify Practicable Solutions that can be Implemented
- Describe in Detail How Implementation can be Accomplished and by Whom
- Establish Integrated Management Plan/Schedule

5. Reviews at Critical Assessment Milestones

- Conducted throughout project by Senior Acquisition Executive Working Group
- Update and Review Prior to All Official Project Panel Meetings
 - USD/AT&L, Policy
 - Service Acquisition Assistant Secretaries
 - PA&E Representative
- Gold Team Review of 1st Draft Report/Red Team Review of Final Draft
- COCOM Representatives



Info Brief



U.S. AIR FORCE

Defense Acquisition Performance Assessment (DAPA) Project

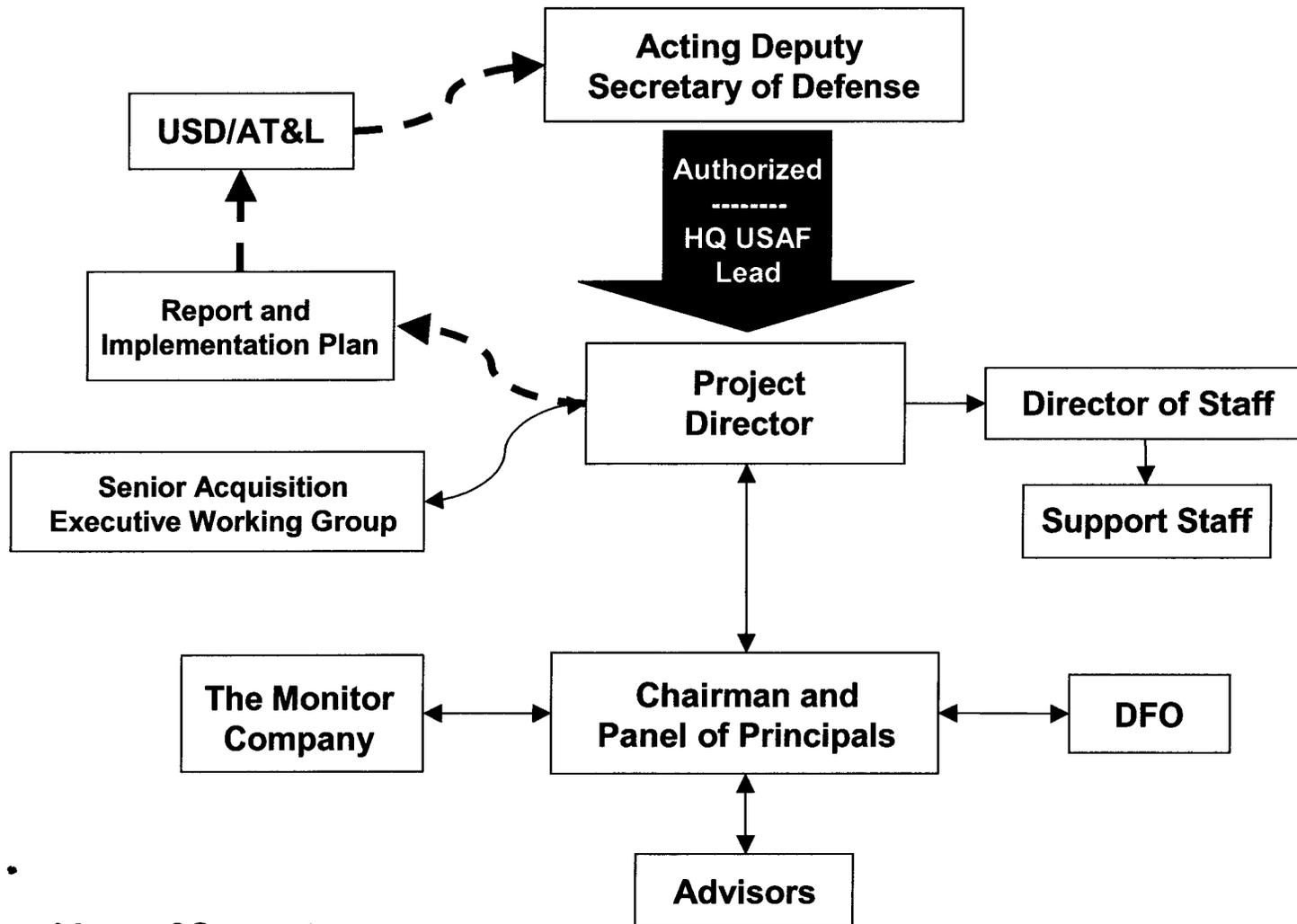
Purpose of Project

“...to provide recommendations on how the Department of Defense generally and the Services specifically can improve the performance of the Defense Acquisition System. The recommendations will inform the 2006 Quadrennial Defense Review and form the basis of an implementation action plan.”

“...consider every aspect of acquisition, including requirements, organization, legal foundations (like Goldwater-Nichols), decision methodology, oversight, checks and balances – every aspect.

The output will be ...a recommended acquisition structure and processes with clear alignment of responsibility, authority and accountability. Simplicity is desirable.” Secretary England, 7 Jun '05

DAPA Organizational Chart



The Honorable Gordon England, Acting Deputy Secretary of Defense

**SENIOR ACQUISITION EXECUTIVE
WORKING GROUP**

Deidre Lee

Claude Bolton

Blaise Durante

John Young

Frank Anderson

DAPA Project Leadership

Dave Patterson, Director

Eileen Giglio, Deputy Director

Col Alan Boykin, Director of Staff/DFO

DAPA Panel

Gerald Abbott

Francis A'Hearn

Frank Cappucio

Richard Hawley

Ron Kadish

Don Kozlowski

Linda Brandt (Alternate)

Judy Stokley (Alternate)

ADVISORS

Al Hutchins

Mark Lumb

Methodology

Three Phase Approach

Qualitative Assessment, Analysis and Implementation

- Literature Search
- One-on-One Oral Interviews and Analysis
- Implementation Plan

- **Phase One: Literature Search**

- Contracted to The Monitor Company (Harvard Business School)
- Objective
 - Independent/unbiased Perspective
 - Goldwater – Nichols NOT Baseline
 - 1985 Forward
 - Provide Summary of Past Acquisition Reform Work as FACTUAL Foundation for Current and Future Work and to Inform the QDR

Peer Reviews
At
Critical Assessment
Project Milestones

Methodology

– Tasks Required

- Catalog All Major Past Acquisition Reform Studies and Initiatives
 - Review Salient Literature: Books, Articles, Reports, Memoranda, Presentations and Other Publications
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 - Assess Actions Taken to Implement the Initiatives Reviewed.
 - Summarize Lessons Learned
 - Provide Analysis and Recommendations Based on Literature Search
- **Phase Two: One-on-One Oral Interviews and Analysis**
 - Interviews with Selected Industry, Labor Union, Trade Associations and Government Acquisition Representatives

Methodology

- **Phase Two: One-on-One Oral Interviews and Analysis** (cont.)
 - Interview Subjects – Program Managers, Business Resource Executives and Other Subject Matter Experts
 - Industries:
 - OEM Program Managers - Boeing, Lockheed, General Dynamics, Northrop Grumman, BAE SYSTEMS, Raytheon
 - Subcontractors – Honeywell, Rockwell Collins
 - Labor Unions
 - UAW
 - IAM
 - SPEEA
 - Trade Associations – AIA, etc.
 - Key Government Executives

Methodology

- **Phase Three: Implementation Plan**
 - Assessment and Vetting of Recommendations
 - Identify Practicable Solutions that can be Implemented
 - Describe in Detail How Implementation can be Accomplished and by Whom
 - Establish Integrated Management Plan/Schedule

- **Peer Reviews at Critical Assessment Milestones**
 - Conducted throughout project by Senior Acquisition Executive Working Group
 - Update and Review Prior to All Official Project Panel Meetings
 - USD/AT&L, Policy
 - Service Acquisition Assistant Secretaries
 - PA&E Representative
 - Peer Review Committee
 - COCOM Representatives

Project/Panel Division of Responsibilities

Panel Principals

Study Areas

Ron Kadish

Don Kozlowski



Acquisition Program Management, Decision Making Methodology and Planning Processes, Implementation Plan (A. Hutchins)

Frank Cappuccio

Richard Hawley



Pre-Acquisition Planning, Acquisition Strategy Development, Requirements Management, Oversight (Checks and Balances)

Gerry Abbott

Sid A'Hearn

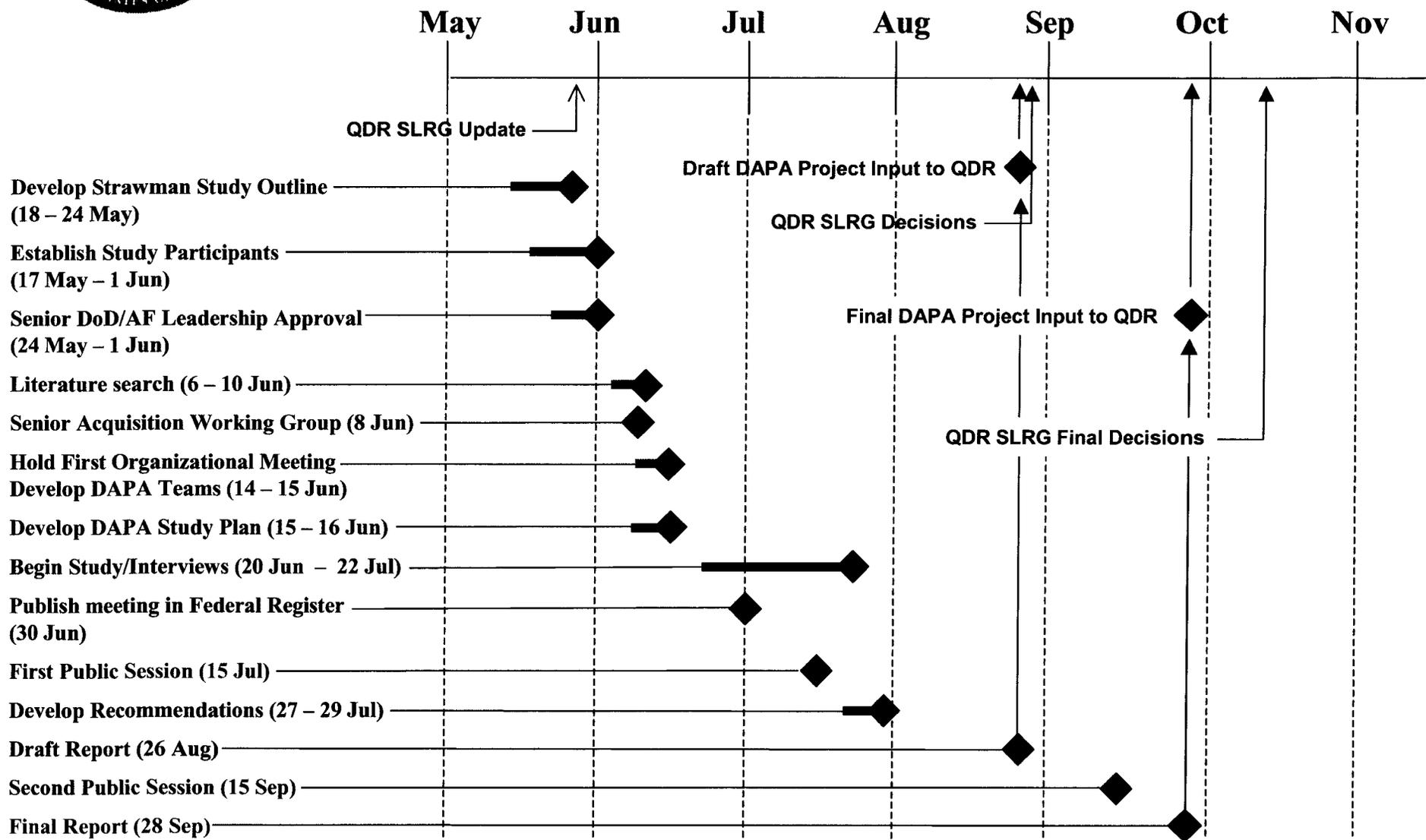


Organization – Acquisition Task Alignment, Program Manager Training, Certification Processes, Regulatory Policy/Legislative Impacts



U.S. AIR FORCE

DAPA Study Timeline





U.S. AIR FORCE

Defense Acquisition Performance Assessment (DAPA) Study

PLANNING & STAFFING OPORD

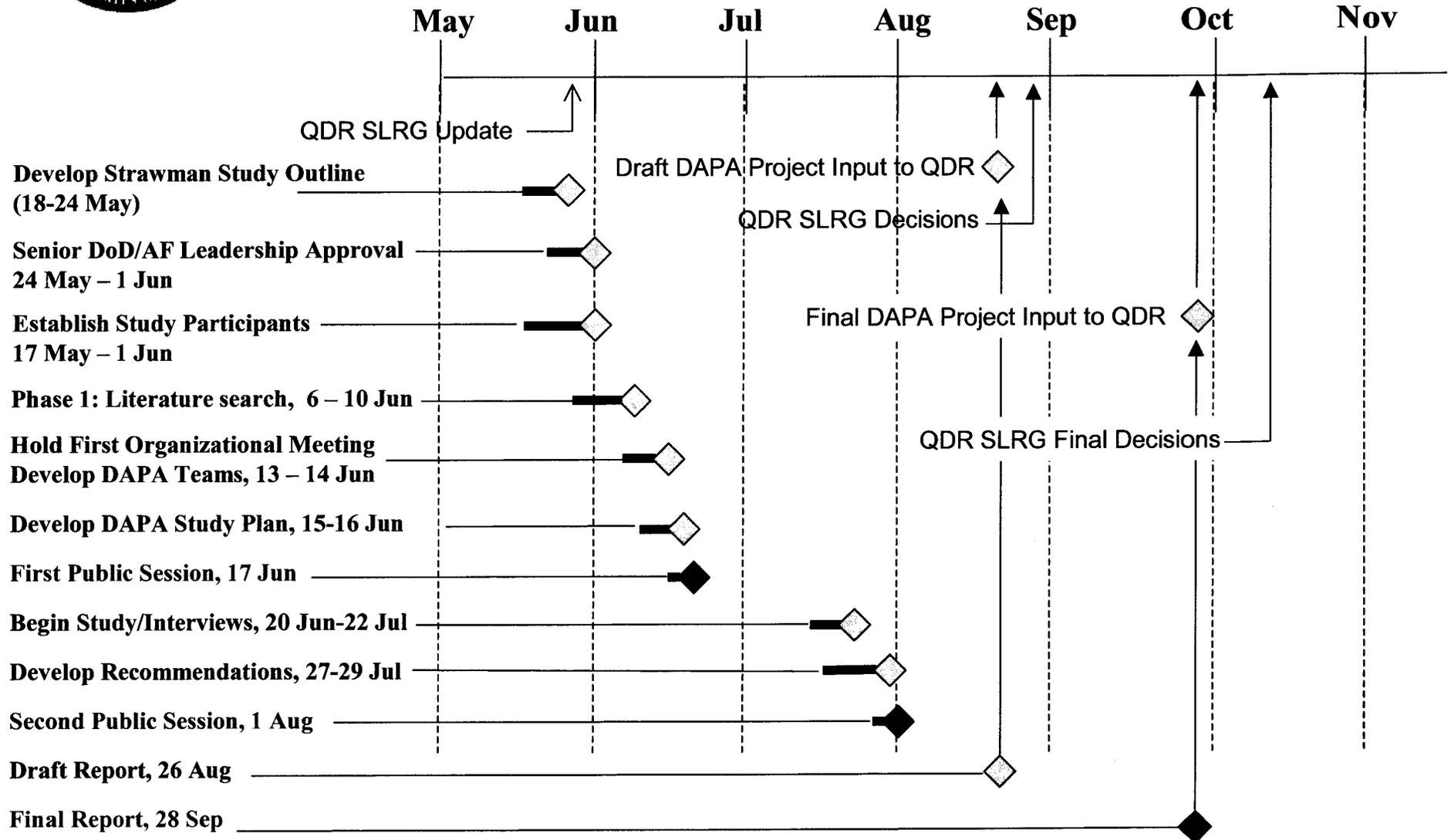
8/29/2005



DAPA Study Timeline



U.S. AIR FORCE





DAPA Study Team

Mr. Dave Patterson, Chair
Col Al Boykin, Secretary



U.S. AIR FORCE

TEAM	FOCUS AREA	TEAM MEMBERS
#1	<u>Acquisition Workforce - Organization</u> > Baseline timeframe – Wing level > Compare staff levels > Cost, schedule & performance impacts	Mr. Frank Cappuccio Mr. Mike Ryan Mr. Dick Scofield Project Officer: Lt Col Rene Bergeron
#2	<u>Acquisition Workforce - Management</u> > PM selection and OSD approval process > Changes in acquisition workforce > Governance & oversight – PM empowerment	Mr. Don Kozlowski Mr. Lawrence Taylor Mr. Paul “Spyder” Lockhard Project Officer: Maj Mike Thirtle
#3	<u>Acquisition Workforce - Training</u> > Workforce training programs > Review & assessment of acquisition certs > Management of certs and waivers	Lt Gen Ron Kadish, USAF (Ret) Mr. Stu Cranston Mr. Mike Hough Project Officer: Maj Todd Manning
#4	<u>Acquisition Processes</u> > Analysis of interdependence of cost/sched/perf > Assess CAIV and TAIV utilization > Value of discipline & structure using case studies > Competitive Process/Revised contracting policies	Gen Richard Hawley, USAF (Ret) Mr. George Schneiter Mr. Larry Delaney Project Officer: Maj Bill Braden
#5	<u>Acquisition Stakeholders</u> > Government > Private sector	Dr. Gerald Abbott Mr. John Jaquish Mr. Tom Cooper Project Officer: Lt Col Brett McMullen



Logistical Profile



U.S. AIR FORCE

Administration

- Invitational orders (AQX)
- VIP pre-packages
- Scheduling
- Admin support
- Recording
- Chart building
- Report writing
- OGE 450
- Mbr contracts
- By-laws (elect Chair)
- Charter
- Monitor Services contract
- Virtual-tour / history of previous studies & recommendations
- Agenda for 2 days
- Brief that organizes DAPA discussion

Facilities / Set-up

- Office space
- Conference room (Rm 427, Joe Rainey)
- Computer capability
- Graphics

Logistics

- Lodging reservations (Oakwood)
- Transportation
- Parking
- Security (A-Team / Chris)
- Coffee station (A-Team)
- Lunch planning



BACK UP SLIDES



U.S. AIR FORCE



DAPA Membership



U.S. AIR FORCE

Study Members: Recommended

- **Director – Dave Patterson**
 - **Frank Cappuccio – President, Lockheed Skunkworks ***
 - **Don Kozlowski – Retired Vice President and Program Mgr C-17 Program ***
 - **Lt Gen Ron Kadish, USAF (Ret.)**
 - **Gen Richard Hawley, USAF (Ret)**
 - **Dr. Gerald Abbott – ICAF Prof. Acquisition**
 - **Dr. Francis A'Hearn – ICAF Prof. Acquisition**

Alternates

- **Mike Ryan - Rolls Royce**
- **Lawrence Taylor – VP Space System, Raytheon**

Current Related Studies

USD/AT&L – Literature Search of Previous Studies: Dave Berteau



DAPA Membership (Cont)



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Study Members: *Recommended*

▪ **Additional Alternate Members and Interviewees**

○ **Retired Military**

- **Paul “Spyder” Lockhart**
- **Dick Scofield**
- **Stu Cranston**
- **Mike Hough**
- **Joe Dyer**
- **John Jaquish**

○ **Former Government**

- **George Schneiter**
- **Larry Delaney**
- **Tom Cooper**
- **Irv Blickstein**

○ **Other**

- **Peter Lennon**
- **Steve Cortese**
- **Marty Meth**
- **GAO Representative**
- **DoD/IG Representative**
- **SASC Staff Representative**



Tasks By Phase



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Phase One: (Literature Search)

Establish Baseline "Forensics of What Happened." 1991 timeframe (DMR Implementation) to Present. Including:

- **Review Pertinent Studies (DSB, GAO, IG, SAB, RAND, Space Commission, Lighting Bolts, Eagle Looks, etc.,)**
 - Consider recommendations and common themes
 - Examine how we implemented the recommendations and results
 - If not implemented, why not
- **Review the Changes in Statute and Policies (DoD, Military Department and Local)**
 - Assess Impacts on how we do business
 - Assess success in compliance
- **Track Changes in Acquisition Philosophy Over Time**



Tasks By Phase (Cont.)



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Phase Two: (Study)

Examine the "As-Is" Acquisition and Sustaining Processes and Structures Including:

- **Acquisition Workforce – Organization**
 - **Review and Evaluate How the Acquisition Organization has Changed in the Baseline Timeframe Down to the Wing Level**
 - **Compare Staff Levels**
 - **Assess Impact in terms of cost, schedule and performance**
- **Acquisition Workforce – Management**
 - **Evaluate Program Manager Selection and OSD Approval Process**
 - **Identify Changes in Acquisition Workforce Leadership Qualifications, Experience and Skills**
 - **Assess Governance and Oversight – Level of Empowerment for PMs**



Tasks By Phase (Cont.)



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Phase Two: (Cont.)

- **Acquisition Workforce Training**
 - Review Workforce Training Programs (Military Department Programs, ICAF, DAU, In-House, Mentoring, etc.,)
 - Compare 1980s, 1990s and Current Course Material
 - Review and Assess Acquisition Certification Including Management of Certification and Waivers
- **Acquisition Processes**
 - Analysis of Interdependence of Cost, Schedule and Performance
 - Assessment of Cost as an Independent Variable and Time as an Independent Variable to Stem Requirements Insertion
 - Describe the Value of Discipline and Structure Using Case Studies
 - Assess the Competitive Process and Describe How Revised Contracting Policies Might Drive Improved Manufacturing and Lower Costs
- **Acquisition Stakeholders – Players in the Process**
 - Government - Congress, OSD, Administration, Military Departments
 - Private Sector – Industry, Organized Labor, Trade Associations



Tasks By Phase (Cont.)



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Phase Three: (Recommendations)

Develop Recommendations for Acquisition Performance Improvement as Input to the 2006 Quadrennial Defense Review

Phase 4: (Implementation)

Plan and Timeline for Implementing Acquisition Performance Improvements



Agenda



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Defense Acquisition Performance Assessment (DAPA) Study

*Planning Session
14-15 June 2005*

8/29/2005



DAY 1

Tuesday, 14 June 2005

AQ Conference Room, 4E987, Pentagon



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- 0730 Administrative Issues, Col Alan Boykin, Staff Director
- 0735 Welcome from Mr. Dave Patterson, Project Director
- 0745 Remarks from the Honorable Gordon England, Deputy Secretary of Defense
- 0800 Ms. Deidre Lee, Director of Defense Procurement and Acquisition Policy
- 0830 Panel and Team Introductions
- 0900 Break
- 0915 Current State of the Acquisition Process, Prof. Mark Lumb, DAU
- 1000 DAPA Overview, Mr. Patterson
- 1045 Lunch (Executive Dining Room - 3C1064)
- 1300 Remarks (Acting Secretary England)
- 1330 Sr. Acquisition Leadership Panel
- 1430 Break
- 1445 Mr. Frank Wilson, Chief WHS/ASD
- 1530 DAPA: "The Project" (Mr. Patterson)
- 1615 DAPA: "The Plan" (Col Boykin)
- 1645 Summary of Day 1 Action Items
Review of Day 2 Schedule (Lt Col Bergeron)
- 1630 Adjourn



DAY 2

Wednesday, 15 June 2005

A-Team Conference Room (4th Floor)

1560 Wilson Blvd, Arlington VA



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- 0730 Admin (Col Alan Boykin, Staff Director)
- 0735 Welcome (Mr. Dave Patterson, Project Director)
- 0745 Remarks from Honorable Gordon England, Deputy Sec Def
- 0900 Phase 1: Literature Search (Findings) – Part 1
- 0945 Break
- 1000 Phase 1: Literature Search (Findings) – Part 2
- 1030 Team Planning DAPA Milestone Calibration
- 0815
- 0945 Break
- 1000 Team 1 Discussions
- 1030 Team 2 Discussions
- 1100 Team 3 Discussions
- 1130 Lunch (Red, Hot & Blue)
- 1230 The Road Ahead
- 1630 Closing Remarks (Mr. Patterson)
- 1630 Adjourn



DAPA Major Themes *Interviews*



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Major Theme	Interview Question
6. Acquisition accountability (Industry & Government) <i>Thematic emphasis: Both government and industry must recognize and accept integral roles in supporting the warfighter.</i>	<ul style="list-style-type: none">• Who's accountable...?
7. Performance measurement <i>Thematic emphasis: Acquisition cannot be success without the implementation and adherence to performance measurement tools.</i>	<ul style="list-style-type: none">• How do you define success...?
8. Government-Industry partnering strategies <i>Thematic emphasis: Future wars will be won only through the innovativeness and insights of joint government-industry teaming strategies.</i>	<ul style="list-style-type: none">• How do we make them more effective...?
9. Acquisition 2020 <i>Thematic emphasis: We must grown acquisition to meet the changing dynamics of our enemy. Acquisition transformation is key to the success integration of acquisition tools, CoCs and lessons-learned; we must grow and chan.</i>	<ul style="list-style-type: none">• What will it look like...?
10. Organization and management <i>Thematic emphasis: Organization must be structured to provide focused management and leadership towards end-state objective(s).</i>	<ul style="list-style-type: none">• Have we provided the USD AT&L so many tasks that we have watered down his responsibility as SAE?



DAPA Interview Teams



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TEAM	VECTORS	TEAMS
#1	Industry: Labor Union: Government:	Lead: Recorder:
#2	Industry: Labor Union: Government:	Lead: Recorder:
#3	Industry: Labor Union: Government:	Lead: Recorder:
#4	Industry: Labor Union: Government:	Lead: Recorder:
#5	Industry: Labor Union: Government:	Lead: Recorder:



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Defense Acquisition Performance Assessment Project

Methodology and Study Plan Elements



Methodology



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- Qualitative Assessment, Analysis and Implementation
 - Literature Search
 - One-on-One Oral Interviews
 - Peer Reviews at Critical Assessment Project Milestones
 - Implementation Plan
- Literature Search
 - Contracted to The Monitor Company (Harvard Business School)
 - Objective
 - Independent/unbiased Perspective
 - Goldwater – Nichols NOT Baseline
 - 1985 Forward
 - Provide Summary of Past Acquisition Reform Work as **FACTUAL** Foundation for Current and Future Work and to Inform the QDR



Methodology



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- Tasks Required
 - Catalog All Major Past Acquisition Reform Studies and Initiatives
 - Review Salient Literature: Books, Articles, Reports, Memoranda, Presentations and Other Publications
 - Review of work drawn from : DoD and Its Agencies, GAO, CBO, CRS, Non-profit Public and Defense Policy Institutions (CSIS, IDA), Universities and Other Academic Institutions, Aerospace and Defense Companies and Consulting Firms; and Industry Associations and Professional Groups (BENS)
 - Assess Actions Taken to Implement the Initiatives Reviewed.
 - Summarize Lessons Learned
 - Provide Analysis and Recommendations Based on Literature Search
- One-on-One Oral Interviews
 - Interviews with Selected Industry, Labor Union, Trade Associations and Government Acquisition Representatives



Methodology



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- One-on-One Oral Interviews (Continued)
 - Interview Subjects – Program Managers, Business Resource Executives and Other Subject Matter Experts
 - Industries:
 - OEM Program Managers - Boeing, Lockheed, General Dynamics, Northrop Grumman, BAE SYSTEMS, Raytheon
 - Subcontractors – Honeywell, Rockwell Collins
 - Labor Unions
 - UAW
 - IAM
 - SPEEA
 - Trade Associations – AIA, etc.
 - Key Government Executives

Headquarters U.S. Air Force

Integrity - Service - Excellence

Expectations Management Agreement (EMA) Awareness Briefing



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Briefer:

**Major Mark Calfee, USAF
SAF/AQXA 703-253-5624**

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EMA Overview

- **The what and why of EMAs**
- **Who directed it and who has to use it?**
- **What purpose does it serve?**
- **When is it required and how is it implemented ?**
- **How do you get started?**
- **Where can I get help?**
- **Summary**
- **Questions**

Warfighter-Operator Agreement

- Documents any cost/schedule/performance/risk agreements between the warfighter and the acquisition community not found in other approved documentation (i.e. ICD, CDD, CPD, APB)
- Promotes effective two-way communication resulting in credibility between the acquirer and the operator





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Why Expectations Management?

“It is impossible to speak in such a way that you cannot be misunderstood.”

*~Karl Popper, **Unended Quest***



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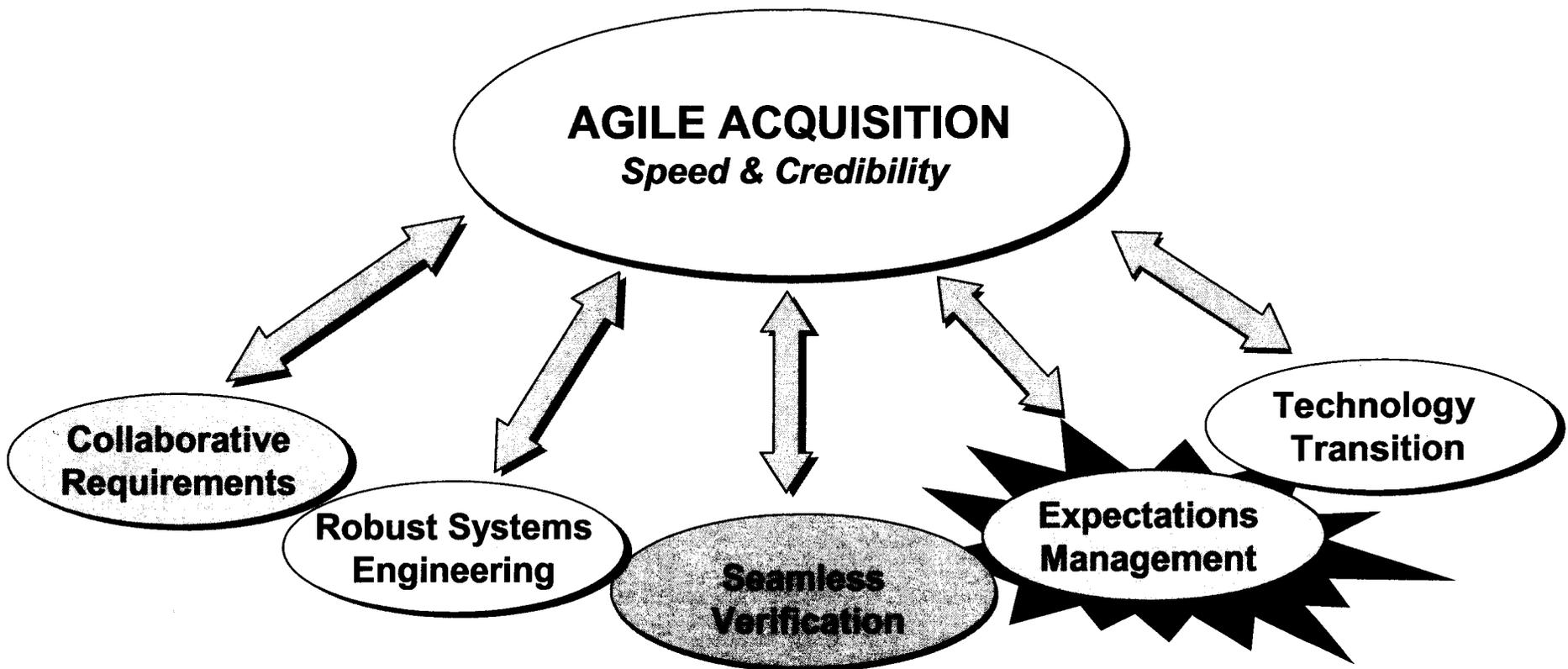
Why Expectations Management?

- **Developers/Operators sometimes interpret requirements differently**
- **Changes occur throughout development impacting cost, schedule, performance, and risk**
- **Different views of probability of success**
 - ◆ **Acquisition community assumes 50-60%**
 - ◆ **Operator assumes 100% probability of success**
- **Impacts are not always documented**
- **Expectations can drift apart**
- **Credibility suffers**



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Why Expectations Management?



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Who directed it and who has to use it?

- ◆ Directed by Dr. Marvin R. Sambur, the Assistant Secretary of the Air Force (Acquisition), (SAF/AQ)

- ◆ Policy letter 04A-002 of February 24, 2004
- ◆ One of the five key tenets of Agile Acquisition
- ◆ Reinforced in AFI 63-101



- ◆ Program Managers/Users:

- ◆ All programs producing Program Management Directives (PMDs)

- ◆ PMDs directed under Nov 03 HOI 63-1

- ▶ Headquarters Air Force Guidance for Preparing Program Management Directives (PMD)
- ▶ Provides the procedures for attaching the EMA to PMDs





What purpose does an EMA serve?

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- **Communicates the agreement between the warfighter and the acquisition community**

- **Purposefully designed to allow flexibility and tailoring to individual program situations**
 - ◆ **Format not prescriptive**
 - ◆ **No checklists**



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When is it required and how is it implemented ?

- **Defines collaborative process between warfighter & acquirer to review Prgm**
 - ◆ **May already exist within current programs**
 - ◆ **For new programs – will need to establish an EMA process**

- **Reviews should be conducted at least annually and should address:**
 - ◆ **Cost, schedule, performance, sustainment, and risks associated with meeting operational requirements**

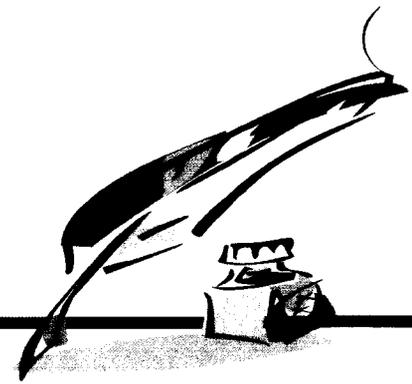
- **Ensure review process allows for open communication between war fighter & acquirer in establishing a common understanding of:**
 - ◆ **Contents in Requirements/Capabilities Documents**
 - ◆ **Program status and progress towards meeting requirements**

- **Output of the process (or reviews) should be an EMA**
 - ◆ **Communicates expectations between the warfighter and the acquisition community including roles and responsibilities – becomes a documented agreement**
 - ◆ **Flexible & tailored to individual programs**
 - ◆ **Not prescriptive & not a checklist**



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Putting Pen to Paper



- **Start with the program ORD/Capabilities Document (ICD, CDD, CPD) and the integrated risk management plan**
- **Are the KPPs and any associated thresholds clear? If they aren't, document the common understanding after discussions.**
 - ◆ **Are there any non-KPP requirements that aren't straightforward and could be open to interpretation? If there are, document the common understanding after discussions.**
- **Are there any implied requirements that should be documented?**
- **Are there any "handshake" or "sidebar" agreements that need to be documented?**
- **Are there any trade-offs that have been made as a result of areas identified with medium to high levels of risk?**
- **Do we both have a complete understanding of the funding and costs of the program?**



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Putting Pen to Paper (contd)



- **Based on a common understanding of the capability requirements, what funding is needed to execute the program?**
- **Has the warfighter provided and/or budgeted enough money to execute the program?**
 - ◆ **If not, what actions are going to be taken to resolve shortfalls?**
 - ◆ **Document those agreements and actions in the EMA.**
- **Do we both understand what will be delivered and when?**
- **Based on the common understanding of requirements and funding what is the planned schedule for the program?**
- **Has anything changed that will impact the planned schedule for the program?**
 - ◆ **If so, discuss plans to adjust the schedule and document the newly agreed to schedule.**



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Bottom Line - Is the program executable?

- ◆ **Do the capability requirements match the funding and match the schedule?**
 - ◆ **If it doesn't, then come to an agreement with the operator on what needs to be done to get a match of the capability requirements with the funding and the schedule.**
 - ◆ **Document in the EMA what each side needs to do to achieve the executable program.**



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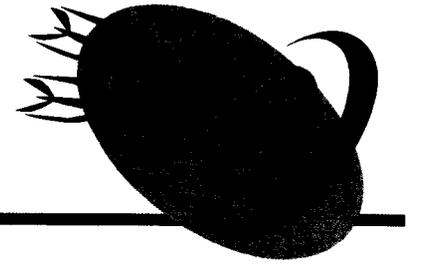
Overarching Statement

“After completing discussions on the status of the XYZ program we agree that the program is fully executable based on the program funding profile found in XXXX, the requirements documented in XXXX, and any changes, additional agreements, or exceptions identified in this EMA.”



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10 Questions to Ensure You're on Target



- 1. If someone put the Program Manager in one room and the operator in another, would they both say the same thing about the programs requirements, funding, and schedule?**
- 2. Does your EMA simply repeat requirements that are documented in other program documentation or does it identify agreements not currently documented elsewhere?**
- 3. Did you include in your EMA all of the “sidebar” and/or “handshake” agreements that are critical to the successful execution of the program?**
- 4. If either the Program Manager or operator representative were to leave the program tomorrow, will their replacements know what each side is expected to provide for the successful execution of the program?**
- 5. Would there be anyone surprised if the status of your program were briefed at a Capabilities Program Execution Review (CPER) or any other program review where the operator was present?**



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10 Questions to Ensure You're on Target

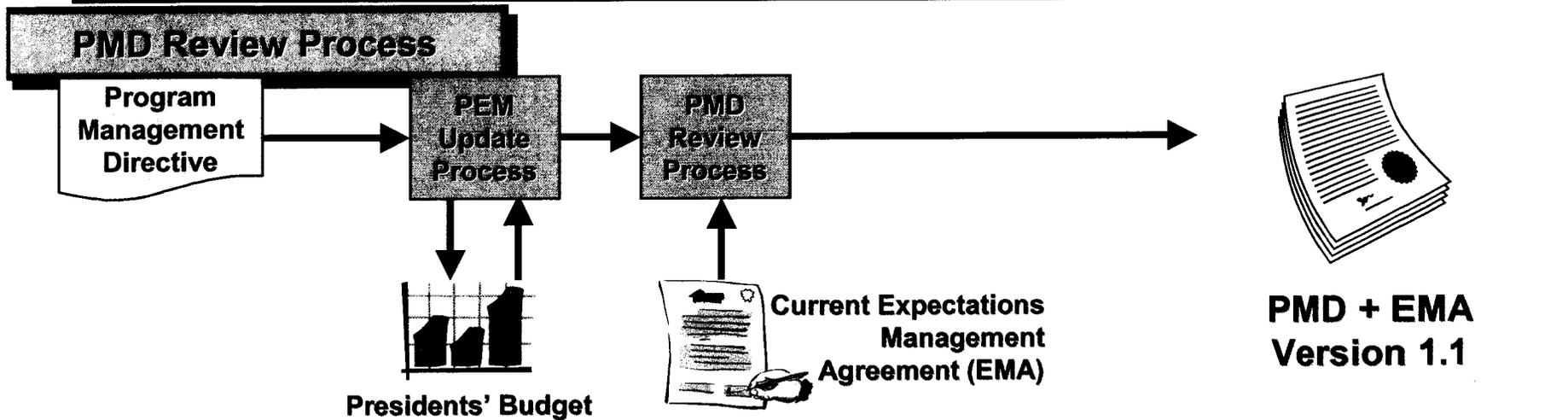


- 6. Has your program experienced any changes in funding, schedule, or capability requirements? If yes, can you still deliver 100% of what the operator requires and when they need it?**
- 7. Are the changes occurring in the program frequent enough and significant enough that I should talk to my operator counterpart more than once a year?**
- 8. Are your bosses (both on the acquisition and operator side) aware of the agreements you are making to successfully execute the program?**
- 9. Can anyone reading my EMA clearly understand what both the acquisition community and operator have agreed to do in order to have a fully executable program?**
- 10. Has your program team ever sat down with the operator and gone over the Capabilities/Requirements Document to ensure both sides have a common understanding of what is required? (Especially for those new programs with ICDs)**

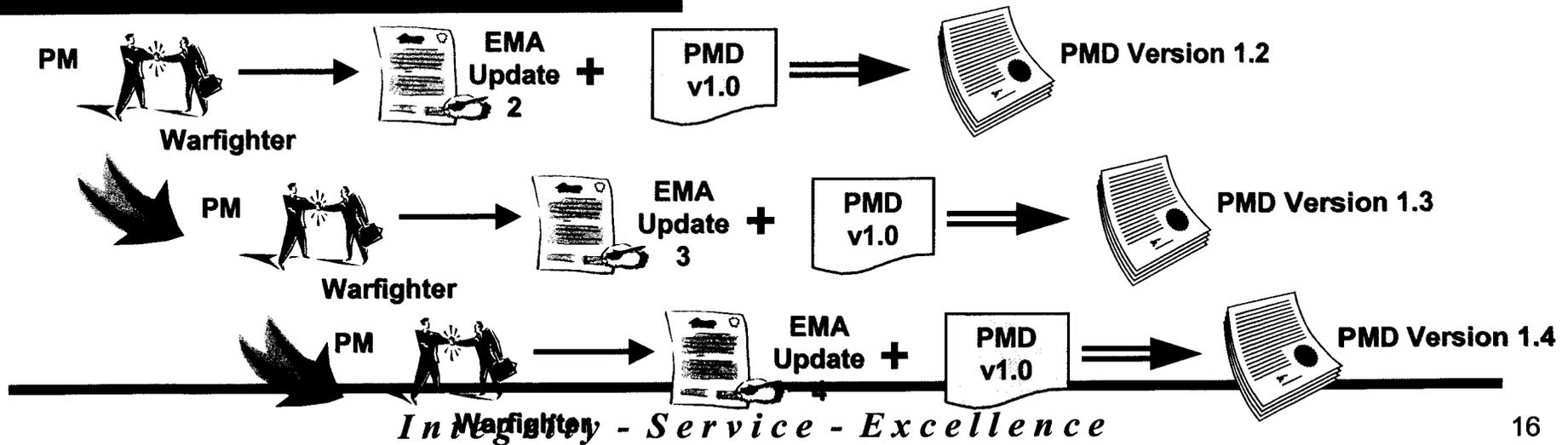


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Coordination Process



Expectations Management Process

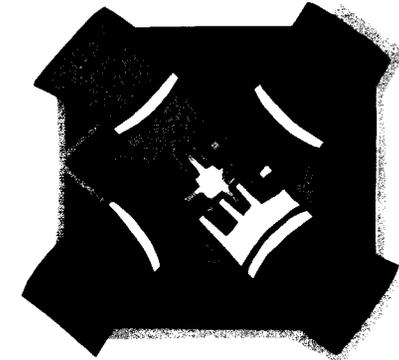




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Where can I get help?

- **Expectations Management Agreement IPT**
 - ◆ **Established Jun 04**
- **Lead by SAF/AQXA and AFMC/XRQ**
- **Goals:**
 - ◆ **Develop helpful guidance, tools, training, examples, etc**
 - ◆ **Develop communication plans**
 - ◆ **Identify metrics to track success of IPT initiatives**
- **Website CoP and Helping Guidance**
 - ◆ **<http://www.safaq.hq.af.mil>**
 - ◆ **http://www.safaq.hq.af.mil/acq_pol/pmtoolkit.shtml**





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IPT Products

- **Community of Practice within AFMC's Knowledge Now***
 - ◆ **Awareness briefing**
 - ◆ **EMA guide and examples**
 - ◆ **Frequently Asked Questions**
 - ◆ **Town hall video of Dr. Sambur**
- **Center-specific communication plans**
- **Results-driven metric for System Metric and Reporting Tool (SMART)**
- **Pilot programs (AAC, ASC, ESC and WR-ALC)**

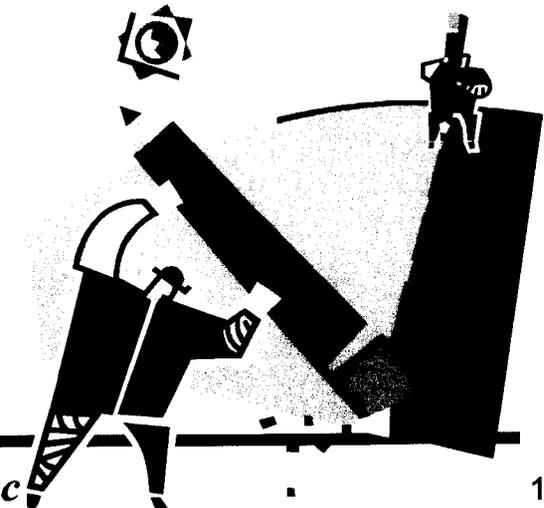
***(<https://afkm.wpafb.af.mil/ASPs/CoP/openCoP.asp?Filter=OO-AQ-MC-01>)**



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Pilot Program Findings

- ◆ EMAs considered “good cross-staff work”
- ◆ Guide and examples – good tools
- ◆ Many programs have processes in place to communicate/collaborate with operator
- ◆ Various ways to structure EMAs
 - ▶ System level
 - ▶ Program element
 - ▶ Individual program/project
 - ▶ Acquisition/sustainment





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Summary

What does the EMA Policy Do?

- **Programs have a process to manage requirements, cost, schedule, risk and performance expectations**
- **Program office and operator meet at least annually to review and adjust the expectations**
- **Output of review = Expectations Management Agreement (EMA)**
- **GO/SES signatures ensure a big picture look**
- **EMA is attached to the PMD**
- **EMA coordination is independent of the PMD review process**



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Summary

What has it accomplished?

- ✓ Took EMA from a policy to a fully deployed business practice
- ✓ Developed a knowledge center of guidance, tools, training, examples, etc.
- ✓ Conducted roadshows across the command and with the warfighters
- ✓ Integrated EMA into AFIT course materials
- ✓ EMA status now tracked in SMART

Result: Understood requirements, Shared expectations, No surprises



HARM Targeting System (HTS) and Smart Targeting and Identification via Networked Geolocation (STING) (contd)

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7. Any expectation concerns or areas of disagreement of either the Program Manager or the Operator (if none, so state)
- None

APPROVALS


Date: 14 Aug 04
THOMAS J. ROBILLARD, SES
Program Director
Counterair Joint Systems Program Office


Date: 11 Aug 04
ROBERT W. CHEDISTER, Maj Gen USAF
Program Executive Officer for Weapons and
Commander, Air Armament Center


Date: 11 Aug 04
DONALD J. HOFFMAN, Maj Gen USAF
Director of Requirements
Headquarters, Air Combat Command

QUESTIONS?



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Dr. Sambur's discussion of GO/SES signatures on EMAs

AAC Town Hall, 19 Aug 04





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HARM Targeting System (HTS) and Smart Targeting and Identification via Networked Geolocation (STING)

1. EMA effective: 16 Jul 04
 - Next EMA Update: Retrofit Decision: Dec 04

2. Acquisition Program Baseline (APB)
 - The HTS R7 SDD program is currently in compliance with expectations in the APB signed 22 Jan 01 (Rev 1, signed 19 Oct 01) with the following exception:
 - Schedule: Due to the F-16 OFP M4+ fielding date changes from Feb 06 to Apr 07, the pod will be fielded with F-16 OFP M3+ (R6 capability) in the 4QFY06 and full precision targeting capability at OFP M4+ fielding (Apr 07)

3. Operational Requirements Document (ORD)
 - The program is on track to meet all Key Performance Parameters (KPPs) in the ORD CAF 329-92-I-F, Precision Geolocation Capability for High Speed Antiradiation Missile (HARM) Targeting System, 30 Sep 99
 - ORD Objective and Threshold Requirements on track include:
 - Precision Targeting Location Timeline
 - Operational Data Recorder
 - Operational Training Mode



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HARM Targeting System (HTS) and Smart Targeting and Identification via Networked Geolocation (STING) (contd)

- Other ORD requirements were in the trade space or agreed to be outside the objectives of the SDD program
 - ♦ MTBM will be the same or better than the fielded R6 pod but will not fully meet ORD requirement
 - Rationale: During program planning, the mechanical gimbal was not planned to be modified; this hardware assembly is the key driver to system MTBM
 - ♦ Detection Range. Detection range will be twice that of the fielded R6 pod.
 - Rationale: During program planning, the system would not fully meet the ORD requirement; at the System Requirements Review (SRR), Oct 00, ACC/DRA16 was briefed the system will provide twice the detection range of the R6 pod. Agreement was documented in the current APB, 19 Oct 01
 - ♦ Unambiguous Identification. Identification will be as good or better than fielded R6 pod.
 - Rationale: During program planning, the system would meet the same level of identification as the fielded R6 pod, but will not meet the ORD requirement.



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HARM Targeting System (HTS) and Smart Targeting and Identification via Networked Geolocation (STING) (contd)

- Performance Parameters
 - Contractor Test and Evaluation (CT&E) and factory testing to date indicate the pod hardware design (with some on-going re-design activities) and software development are on track to achieve all KPPs.
 - The next significant event: Retrofit Decision – Dec 04

- Logistics and Readiness, and Reliability
 - Status as of (16 Jul 04) indicate that HTS R7 will be logistically supported similar to the fielded R6 pod
 - Warfighter desires to keep CAF availability at 80% or better given funding constraints
 - Retrofit (conversion) of fielded pods to the new configuration is on track for contract award in Jan 05 and RAA (15 pods) 4QFY06 (per the APB). CAF availability goals during retrofit timeframe will be jointly set prior to the start of the actual retrofit activity (installation of modification kits in HTS R6 pods).



HARM Targeting System (HTS) and Smart Targeting and Identification via Networked Geolocation (STING) (contd)

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4. Other programmatic expectations identified and agreed to as significant but not found in approved program documentation
 - HTS R6 pod software upgrade (R6x) to provide R6 capability (HARM only targeting) on F-16 CJ OFP M4.2a+ aircraft
 - Status as of (16 Jul 04): R6x is deferred and likely to be cancelled once the retrofit decision is approved in Dec 04. Rationale: R6x is a contingent HTS R6 software upgrade, required only if RAA date of 4QFY06 is delayed beyond the F-16CJ M4.2a+ OFP fielding (now estimated at May 07). Based on the planned pod retrofit schedule and M4.2a+ fielding, all HTS R6 pods will be out of the field, rendering R6x unnecessary. If the retrofit decision were delayed significantly, HTS R6 software in the field would be incompatible with OFP M4.2a+. R6x software would correct this incompatibility.
 - Expect updated R6x status following retrofit decision in Dec 04



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HARM Targeting System (HTS) and Smart Targeting and Identification via Networked Geolocation (STING) (contd)

5. Status of cost expectations vs. existing program cost estimates
 - Investment cost remains consistent with the APB and POM submissions that accurately support the minor adjustments to the program with one exception below.
 - FY06 POM request for 37 pod shortfall for retrofit – supported by COMACC in ACC submission

6. Status of funding expectations for successful program execution
 - Development program is fully supported
 - Retrofit (conversion of R6 pods) is fully funded with the exception mentioned above (37 pod shortfall submitted in FY06 POM)
 - FY05PB:

	\$M	FY04	FY05	FY06	FY07
SDD (R&D)		20.5	17.0	12.3	0.5
Production & Retrofit		4.8	26.5	32.8	14.1
Retrofit Shortfall (FY06 POM)				4.9	1.0



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System Metric and Reporting Tool (SMART) Metric

Red Criteria:

- **An EMA between the acquisition community and the operator has not been initiated or**
- **An EMA between the acquisition community and the operator has not been updated at least annually.**

Yellow Criteria:

- **An EMA or EMA update is being staffed but not signed or**
- **An EMA has been signed, however, significant perturbations have occurred affecting the program that have not been documented in an revised EMA or**
- **An EMA is signed, however, the operator continues to be surprised during formal program reviews**

Green Criteria:

- **An EMA or revised EMA has been signed and if someone put the program manager in one room and the operator is another, they would both say the same thing about program requirements, funding, risks, and schedule**
- **No surprises occur during formal program reviews**



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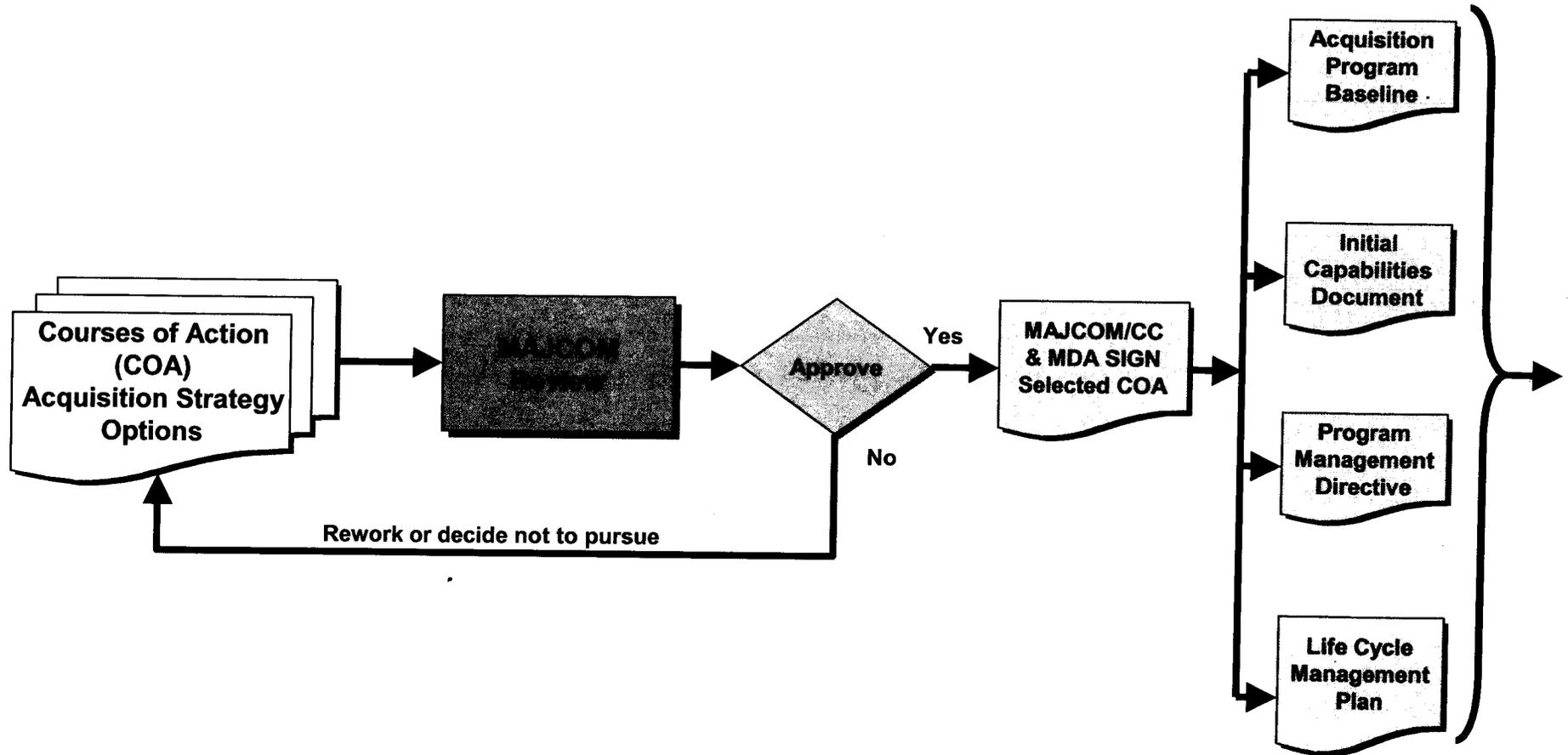
EMA Policy and Tools

- **HOI 63-1, HQ AF Guidance for Preparing Program Management Directives, Nov 03**
- **AFPD 63-1, Capability-Based Acquisition, Jul 03**
- **SAF/AQ Policy letter 04A-002, Feb 04**
- **AFI 63-101, Operations of Capabilities Based Acquisition System (presently in revision)**
- **<https://afkm.wpafb.af.mil> – Expectations Management Agreement**



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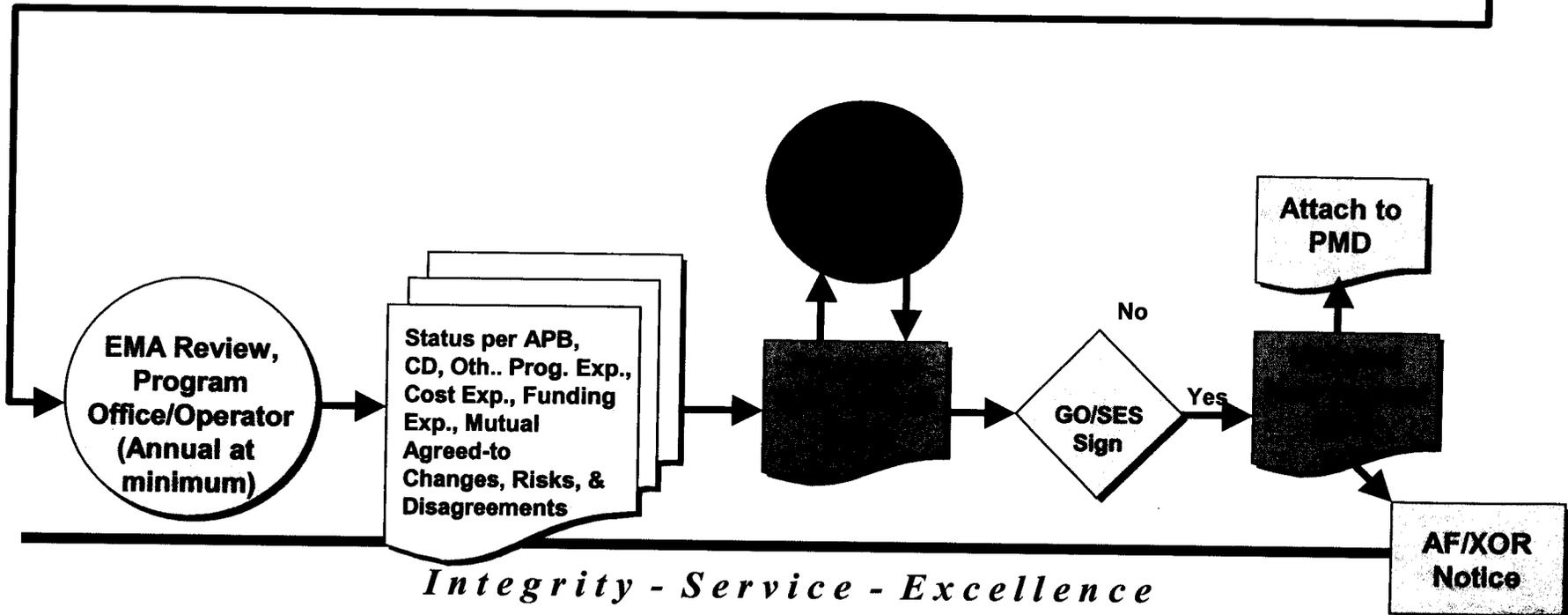
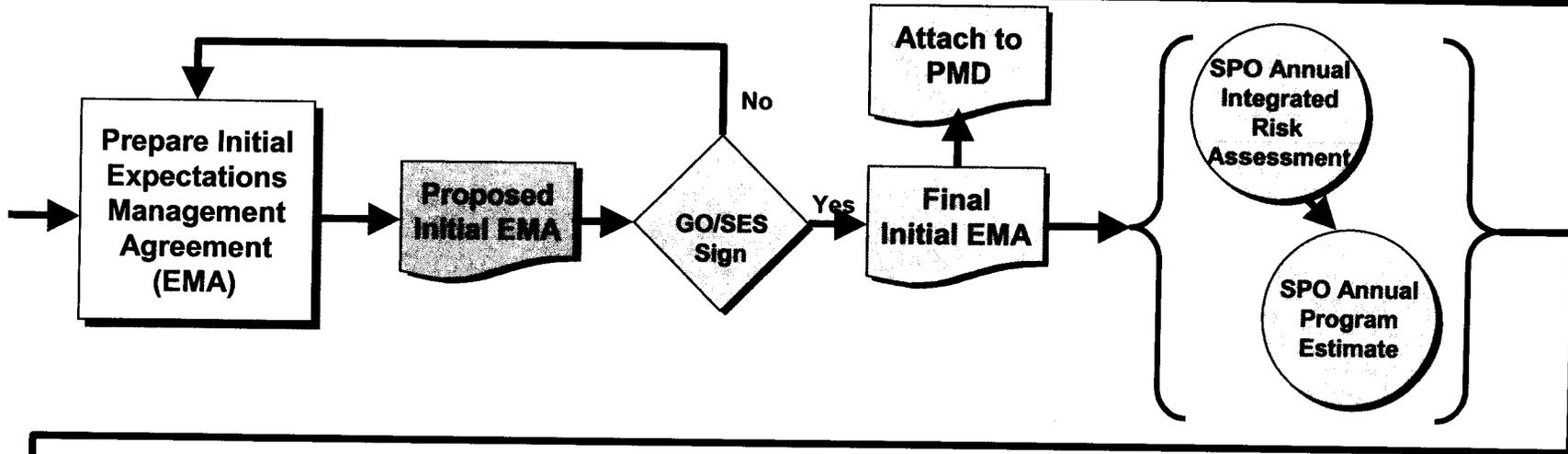
Expectations Management Process Pre-Milestone A





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Expectations Management Process Post-Milestone A



Integrity - Service - Excellence



IPT Membership

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◆ **Co-Leads**

Major Mark Calfee, SAF/AQXA

Ms Nancy Gentry, AFMC/XRQ

◆ **SMC**

Ms Michelle Grace, SMC/FM

◆ **SAF/ACE**

Mr Tim Douglas, SAF/ACE

Mr Robert Martin, SAF/ACE

◆ **OC-ALC**

Ms Mary Wade, OC-ALC/AE

◆ **OO-ALC**

Mr Gary Crawford, OO-ALC/AE

Mr Jim Braddock, OO-ALC/AE

◆ **WR-ALC**

Ms Frances Hunt-Burrus, WR-ALC/AEI

◆ **AAC**

Capt Brian Payne, AAC/CCX

Ms Anita Rowe, AAC/YB

◆ **ASC**

Mr Ed Martin, ASC/AE

◆ **ESC**

Mr Paul Cicchetti, ESC/AE

Ms Cynthia Morgiewicz, ESC/AE

◆ **AFIT**

Mr Kenneth Farkas, AFIT/LSB

◆ **ACC**

Scott Cline, ACC/DRPM

Integrity - Service - Excellence



U.S. AIR FORCE

B-1, B-2, F-16 EMA Implementation

-
- **Use SPO *Program Baselines* to establish EMAs**
 - ◆ Each major mod acquisition program establishes baseline at “program initiation”, i.e., Milestone B or equivalent
 - **Operational Command (e.g. ACC) Signature on Baseline**
 - ◆ **Acknowledges**
 - ▶ Schedule to complete program
 - ▶ Expected cost/funding needed to complete program
 - ▶ Concurrence with performance specified
 - **SPO submits baselines under cover letter – becomes EMA**
 - ◆ PEO (or designate) and ACC/DR (or designate) sign
 - ◆ Cover letter shows programs attached (Few Sentence Summary)
 - ◆ Programs not included are referenced and why, e.g.,
 - ▶ Program awaiting MS B (or equivalent), or program not fully defined
 - **Timing of implementation**
 - ◆ Requirements and Planning Council (R&PC)
 - ◆ Update Baselines to correspond to Annual Budget cycle

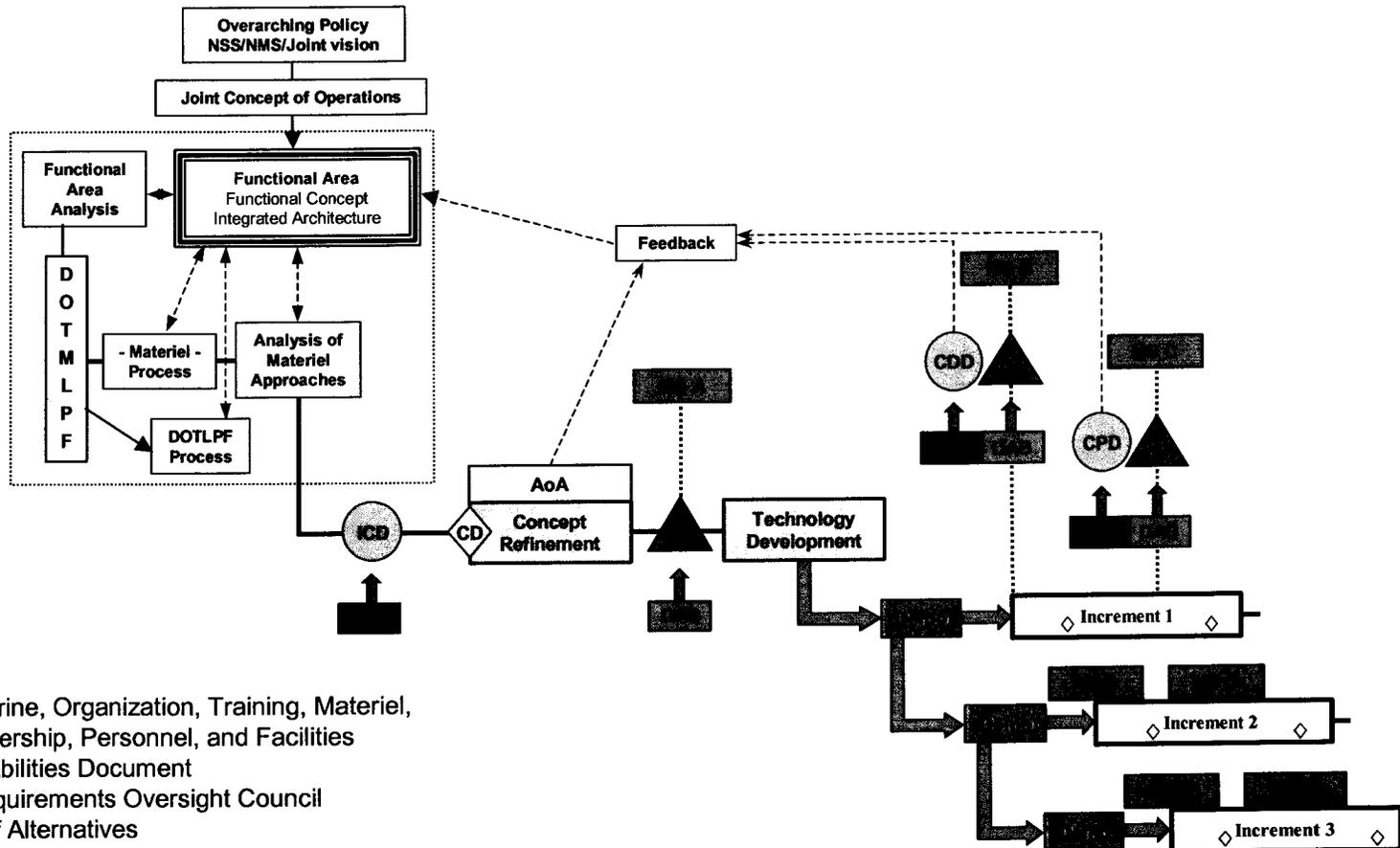


Evolutionary Acquisition Process

Preferred DoD Strategy for Rapid Acquisition of Mature Technology



U.S. AIR FORCE



DOTMLPF: Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities
 ICD: Initial Capabilities Document
 JROC: Joint Requirements Oversight Council
 AoA: Analysis of Alternatives
 DAB: Defense Acquisition Board
 CDD: Capability Development Document
 CPD: Capability Production Document

Source: DODI 5000.2, 12 May 03

MONITOR GROUP

Enabling DoD Transformation

Preliminary Thoughts on Time as an Independent Variable in Support of the Acquisition Framework

August 3, 2004

AMSTERDAM
ATHENS
BEIJING
CAMBRIDGE
CHICAGO
FRANKFURT
HONG KONG
ISTANBUL
JOHANNESBURG
LONDON
LOS ANGELES
MADRID
MANILA
MELBOURNE
MILAN
MOSCOW
MUMBAI
MUNICH
NEW YORK
PARIS
SAN FRANCISCO
SÃO PAULO
SEOUL
SINGAPORE
STOCKHOLM
TEL AVIV
TOKYO
TORONTO
ZURICH

Agenda

- 
- Monitor Perspective on Use of TAIV as a Program Management Tool
 - Managing Uncertainties in the Acquisition Process
 - A Framework for Applying TAIV to Program Acquisition Strategies
 - Enhancing Program Success with TAIV – Some Examples
 - A Contract Framework to Incentivize Contractors to Meet Time Requirements
 - Summary

Context

- At request of TSA/DepSecDef, Monitor explored the potential value of using Time as a boundary condition or driver as a complement to current reforms in 5000.2 to help facilitate Transformation in DoD's acquisition process.
 - Monitor considered Time as an Independent Variable (TAIV) [was considered] as another element, like CAIV, to be applied, especially where it was key that capabilities delivered when needed was most important
- On 12 July, Monitor presented its preliminary conclusions to AUSD/AT&L (Wynne), SAF/AQ, (Carley), DDPA&E (Szemborski), TSA/DSD (Patterson), SA/ASA/AT&L (Kelly), DASN(AM) (Brown), Sr/MA/DOT&E (Keegan), Sr/MA/USD/AT&L (Porter)
 - Monitor suggested that, as with CAIV, there is an opportunity to achieve potentially significant results by exploring TAIV concepts in certain acquisitions as a complement to current processes
 - There was considerable interest in concept and a desire to determine feasibility of TAIV; some comments:
 - If we could incentivize people to make schedule as important as performance, it might be a big hit (today we buy on performance and people fail to achieve time targets)
 - We might explore ways to use profit incentives over which we have control as leverage
 - Time can't be ironclad, or else outside oversight can use it to shape/kill projects
- Mr. Wynne expressed the desire for Monitor to work with his staff to explore further, to understand:
 - Where TAIV might be used (i.e., some division of a subset of programs into mission areas, and then which programs might be most amenable to TAIV, recognizing that it might not be applicable to all programs)
 - Then how it might be applied (recognizing that it might be applied to programs differently)
 - Finally, how it might be used to structure a contract to influence contractor, and program manager, behavior

Agenda

- Context

- Monitor Perspective on Use of TAIV as a Program Management Tool

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Monitor's Perspective on the Use of TAIV as a Program Management Tool

- Traditionally, schedule has been an outcome based on desired performance and/or cost
- We understand that 5000.2 is addressing time with the innovation of Evolutionary Acquisition, however, time as a tool to be used in trades is not fully developed
- We believe that Time – as a unit of measure, not a deadline – can be viewed as an independent variable in a formal selection of acquisition strategy
 - TAIV is not relevant in all acquisitions
 - There are cases where Cost and/or Performance should float
 - TAIV can be implemented as amplifying guidance in the 5000.2 construct as another tool for certain programs where it is applicable
- Using TAIV to plan and manage development requires putting it into practice as a fully realized tool (as has occurred for CAIV)
- Developing a mature TAIV process requires answering the following questions:
 - What types of acquisition strategies (spiral, incremental or single-step) is TAIV best suited for
 - How would it be applied in those cases? How would the TAIV process be designed and what are its practical implications?
 - How can the contract be used to maximize contractor/program manager behavior?

Acquisition as a Three Legged Milk Stool

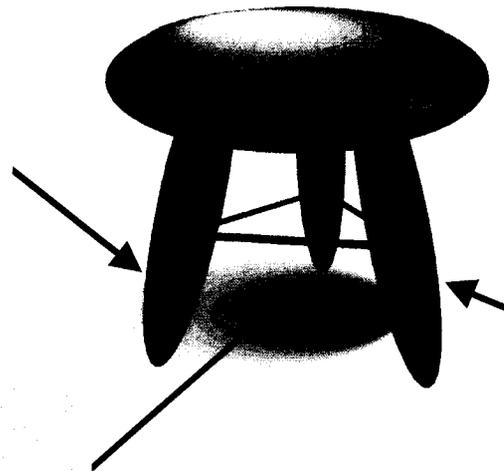
Acquisition process weighs technical, cost, and schedule performance for success

Technical Performance

TPM's used to track attainment of program goals

Cost Performance

Cost As an Independent Variable (CAIV) used during system development to make choices above a threshold requirement on cost verses capability.



Schedule Performance

Traditionally viewed as an outcome that can be traded-off against technical and cost performance.

Time As an Independent Variable (TAIV) could use schedule as a constraint to force choices around investment decisions and acceptable capabilities.

Defining TAIV

- Time as an Independent Variable (TAIV) is not the same as a fixed schedule for development. TAIV is a *tool* that planners can use to perform trades that improve successful management of uncertainties related to time
- TAIV includes
 - Trade study to determine optimal tradeoff between time, cost and performance
 - Timeline based on that trade study that strikes the best balance between aggressiveness and achievability
 - Metrics chosen specifically for the program that can be used both to measure success and to predict upcoming problems
 - Tailored incentive structure that will best motivate managers to achieve program milestones
- TAIV is a tradeable parameter similar to CAIV
 - TAIV analysis focuses on finding the optimal point within the trade space defined by minimum and optimal performance, cost and time
 - Only two of these parameters may be fixed at any one time; the decision process for choosing between them is based on an analysis of the key uncertainties facing the program

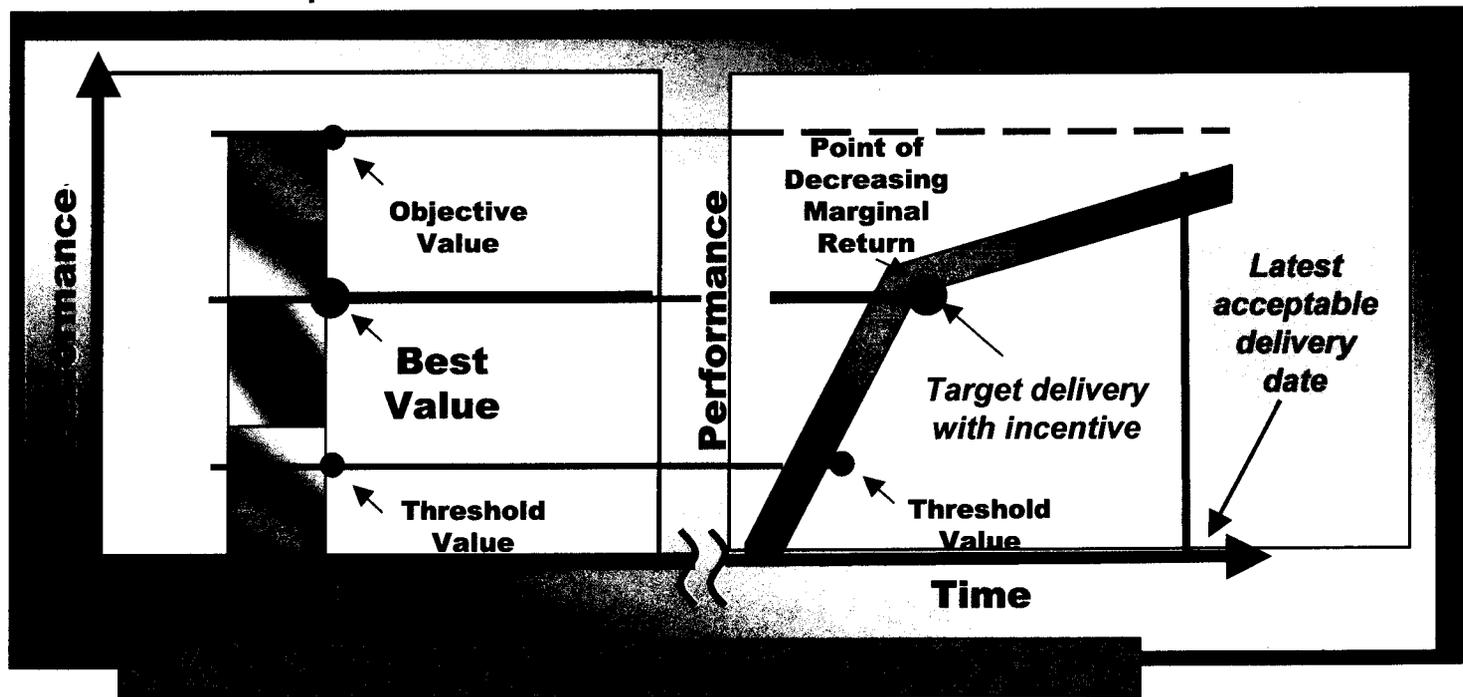
Implementation of TAIV as a Trade Space Dimension

TAIV could become a part of procurements where timeliness is a driver

Government could specify delivery objectives at system level

Contractors would flow down, define, and defend “best value”
time interval or delivery at all program levels based on cost and TRLs

Time would be a key element of system engineering trade studies in procurements to optimize timeliness



Theory of the Case: Applying Time As an Independent Variable (TAIV)

Hypothesis

Making TAIV available as a tool to DoD planners, combined with a process that determines overall acquisition strategy based on key program uncertainties, will enable DoD's transformation and...

Expected Program Success Benefits

- Provide a robust, repeatable process for building more creditable schedules based on intelligent tradeoffs between performance, cost and time
- Manage uncertainties by driving requirements to evolve in parallel with changing technology base and mission needs
- Mitigate external disruption by providing decision makers with credible schedules based on clear analysis
- Introduce needed military capabilities sooner
- Improve alignment with DoD budget cycles, providing increased funding stability

Expected DoD / Industrial Policy Benefits

- Promote innovation and competitiveness within industry by more frequent cycles of competitive opportunities
- Keep pace with innovation by exploiting commercial R&D spending
- Focus both DoD and Commercial R&D investment and foster commercialization of DoD R&D

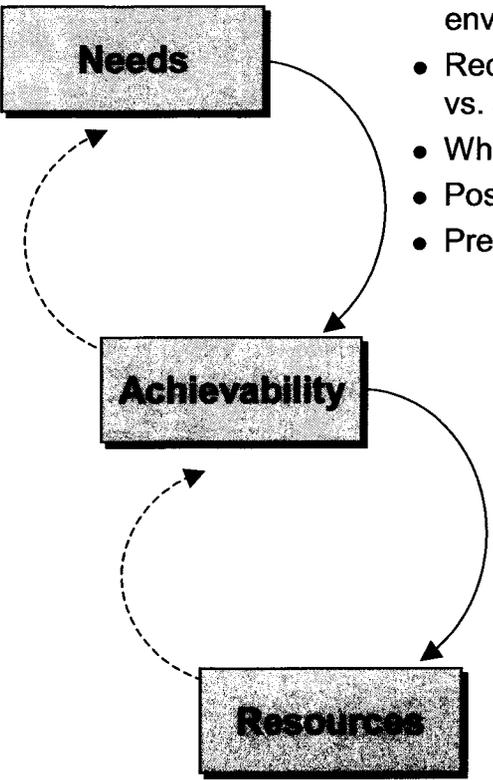
Agenda

- Context
- Monitor Perspective on Use of TAIV as a Program Management Tool
- **Managing Uncertainties in the Acquisition Process**
- A Framework for Applying TAIV to Program Acquisition Strategies
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High Uncertainty Has Characterized the Acquisition Environment

Today's Acquisition challenges derive from uncertainties, including unpredictable threat, actions of key DOD marketplace players such as congress, and a lack of clarity over program future performance and cost. All produce few clues on how to operate more effectively

Key Uncertainties Affecting Acquisition Strategy



- Frequency of changing mission need / threat environment
- Required Capability Needed and When – Desired vs. assured
- What capability can be supplied and when
- Possible emergence of alternative solutions
- Pressure to field something now
 - Performance really achievable
 - Schedule performance
 - Political risks
 - Industrial base capability risks
 - Contractor workload or differing priorities
 - Tech readiness – maturity confidence
- Getting the funding
- Adequate Startup Wedge
- Budget execution
- Industrial Base Availability
- Needed Oversight
- Critical Skills Staffing

Implementation of new tools and strategies

- Revised incremental development to achieve better capability sooner
- Spiral Development for advanced technologies
- Institution of new tools such as TAIV with adoption Incentives

There are Opportunities to Improve Management of Uncertainties in Acquisition Management and 5000.2 Begins That Process

How the Uncertainty was Managed in Past



Needs

- Frequency of changing mission need / threat environment
- Required Capability Needed and When – Desired vs. assured
- What capability can be supplied and when
- Possible emergence of alternative solutions
- Pressure to field something now

- Continue to impose new requirements on on-going programs

- Want to maintain program relevance in face of new needs so inclined to say "Can do!"

- Want to satisfy their customers needs keep program sold , so always say "Can do!"

Achievability

- Performance really achievable
- Schedule performance
- Political risks
- Industrial base capability risks
- Contractor workload or differing priorities
- Tech readiness – maturity confidence

- Tend to want new capabilities before technology is ready- too optimistic on achievability

- Want to maintain program relevance in face of technology maturity uncertainty so inclined to say "Can do!"

- In face of competition and technology maturity uncertainty, inclined to say "Can do!"

Resource

- Getting the funding
- Adequate Startup Wedge
- Budget execution
- Industrial Base Availability
- Needed Oversight
- Critical Skills Staffing

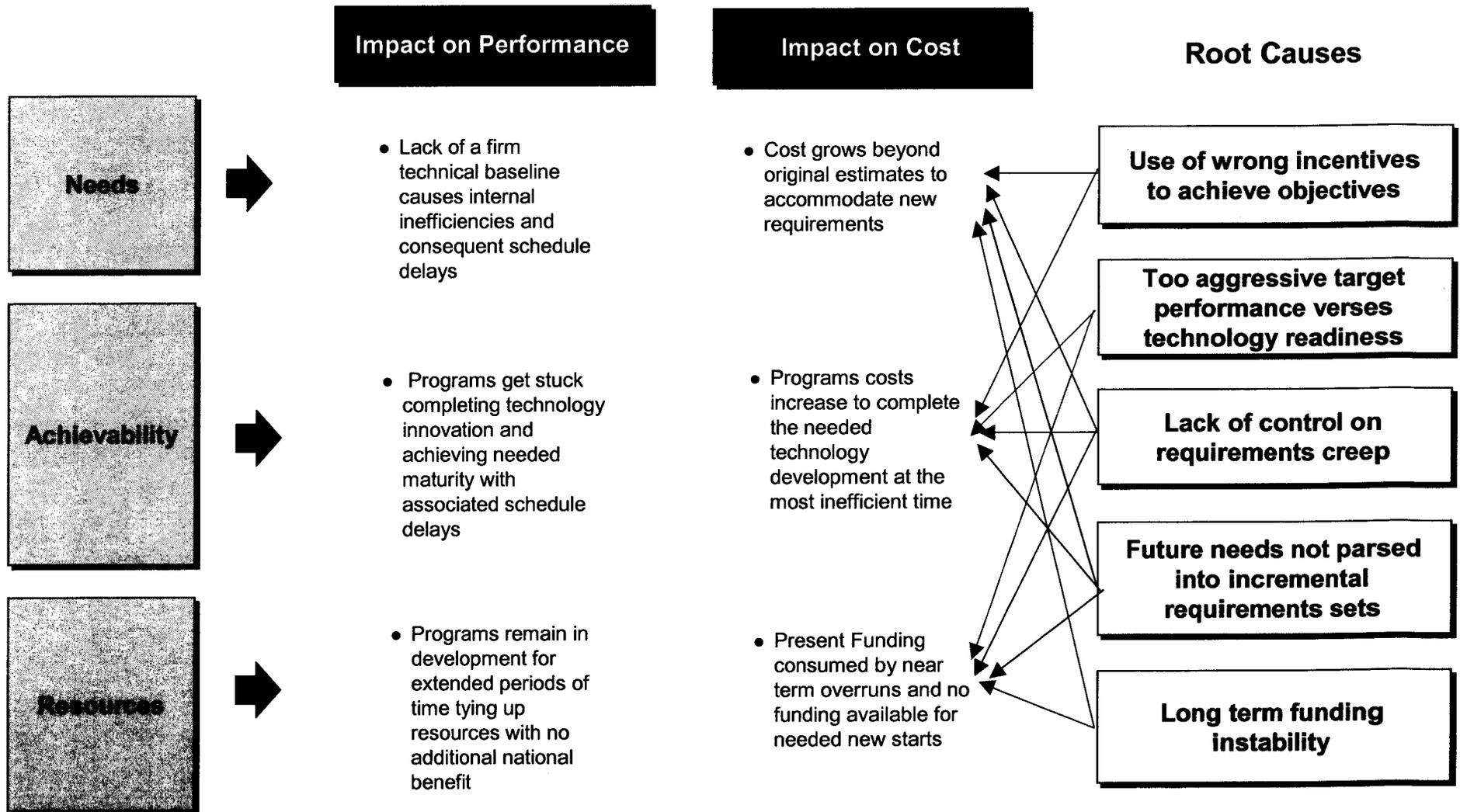
- Presumption that baring something outrageous, resources will be there to execute

- Want to maintain program momentum even when near term funding short.

- Want to maintain business base so motivated to rationalize a way forward, even if a stretch, to get an award.

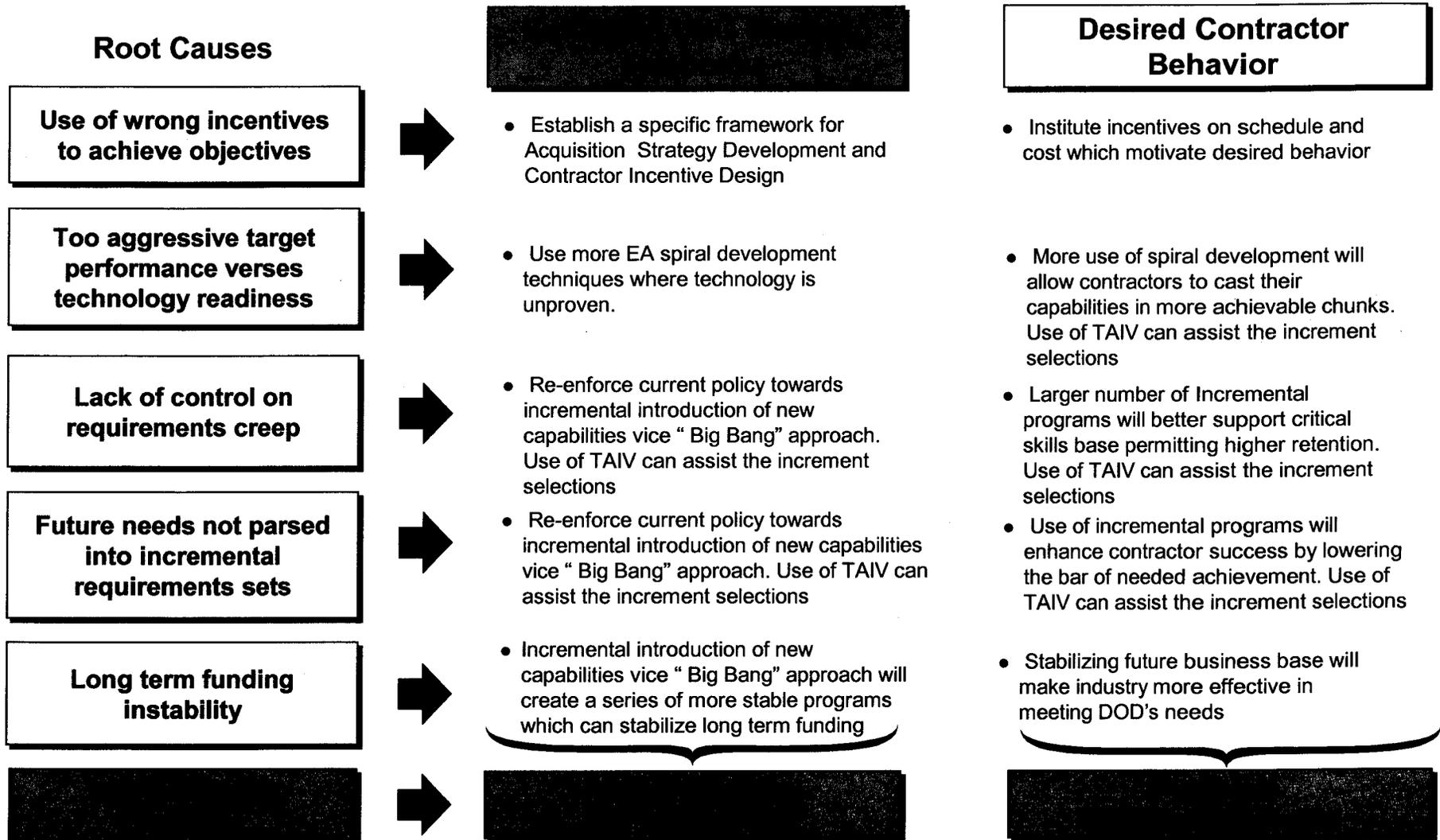
Focus on Root Causes and Manage Uncertainty Where Possible with the Right Tools

A root cause analysis can indicate where enhancements can enhance program success



Address Root Causes to Meet DoD's Schedule and Performance Objectives

TAIV could significantly influence a reversal in the key root causes to improve the future state of performance on selected acquisitions



To Manage Uncertainty, DoD Can Directly Control Some Elements and Influence Others

Identifying those decisions and uncertainties that are under DoD control as well as those that can only be influenced help clarify choices and identify alternative approaches.

Items DoD can Control

What capability can be supplied and when
Pressure to field something now
Performance really achievable
Industrial base capability risks
Contractor workload or differing priorities
Tech readiness – maturity confidence
Getting the funding
Adequate startup wedge
Industrial Base Availability
Needed Oversight
Critical Skills Availability

Items DoD wants to Influence

- Frequency of changing mission need / threat environment
- Required Capability – Desired vs. assured
- Possible emergence of alternative solutions
- Political risks
- Budget execution
- What capability needed and when
- Schedule performance

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Characteristics of Acquisition Approaches and Implications for TAIV

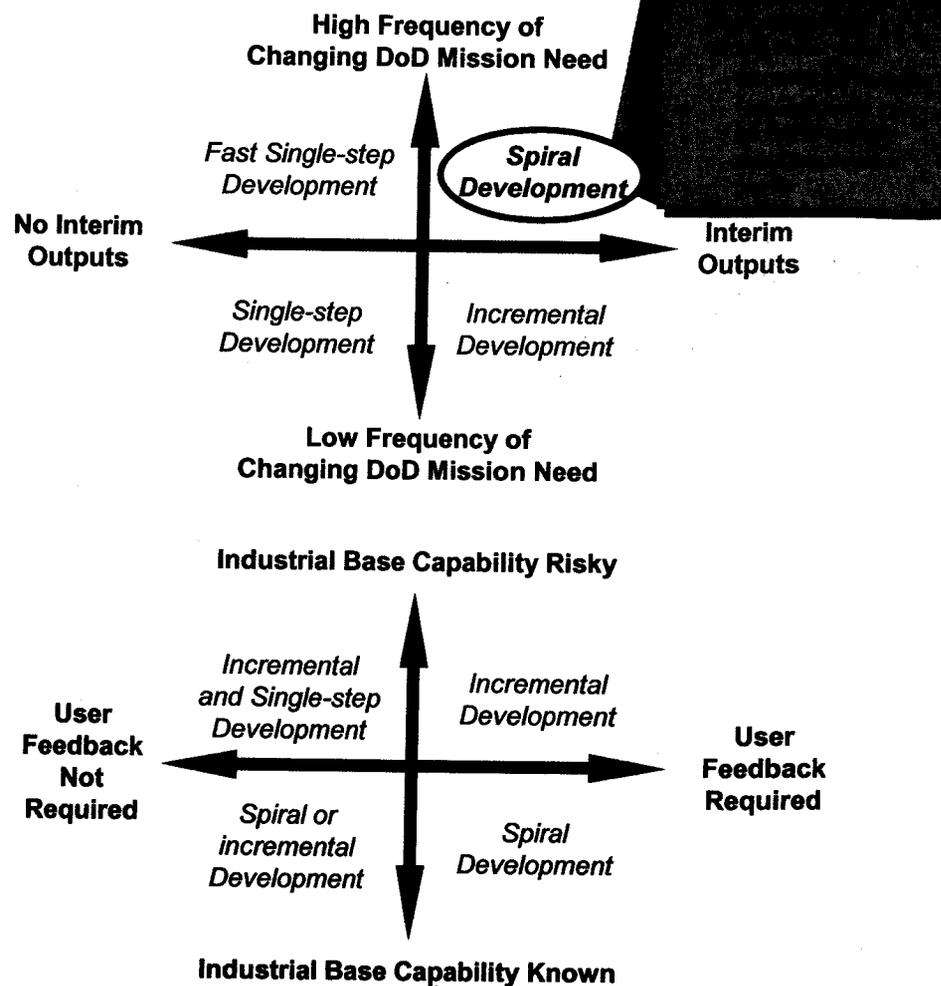
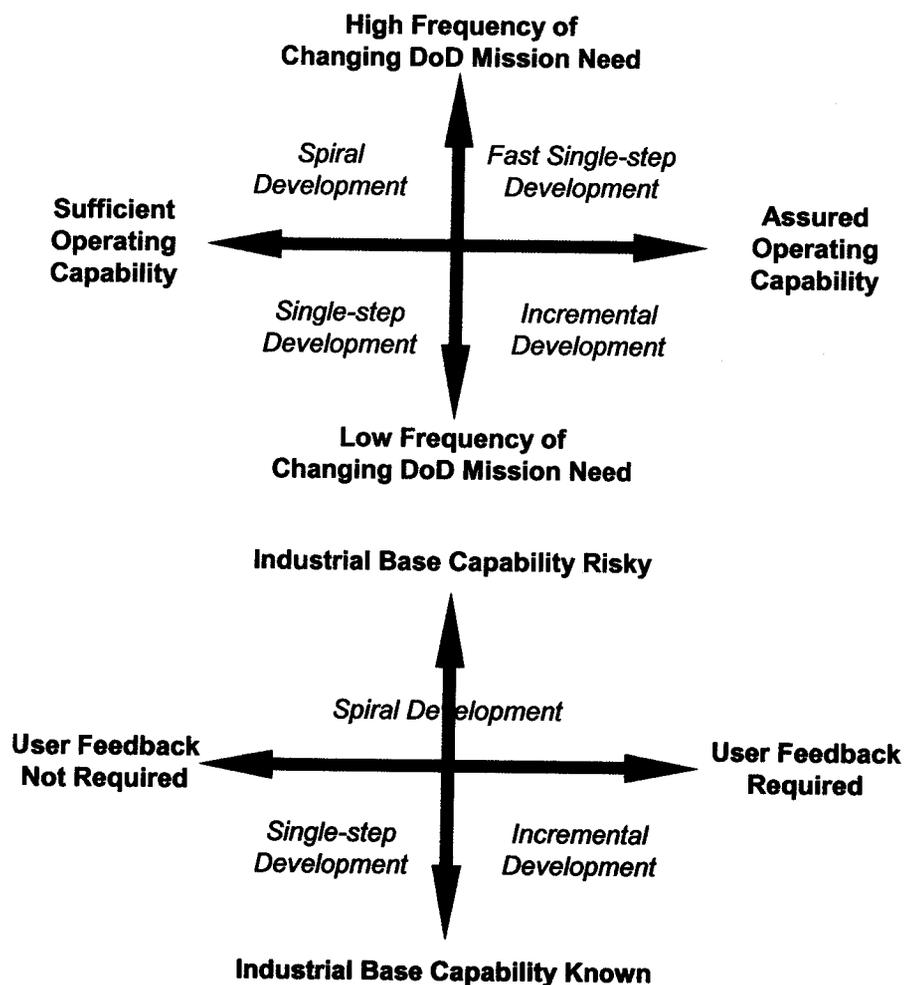
- DoD recognizes three strategies for acquisition. The strategies are distinguished based on whether or not the end-state requirements are known in advance, and whether or not there are multiple development cycles
- TAIV may be used with all three, but different acquisition strategies will have different criteria for the use of TAIV

Acquisition Strategy	End-State Requirements Known	Multiple Development Cycles	Single Cycle	Implications for TAIV
Single-step to full capability	Yes	No	No	<ul style="list-style-type: none"> • Appropriate for commodity parts based on mature technology • TAIV used to set program length and incentivize compliance • TAIV used to set program milestones and incentivize compliance
Incremental Development	Yes	Yes	Maybe	<ul style="list-style-type: none"> • Most appropriate for programs based on mature technology, or programs that require minimum (rather than assured) operating capability • TAIV used to set increment length and incentivize compliance
Spiral Development	No	Yes	Yes	<ul style="list-style-type: none"> • Appropriate for exploratory development programs, programs based on mature technology, or programs that require minimum (rather than assured) capability • TAIV used to set spiral length and incentivize compliance

 Evolutionary acquisition strategy

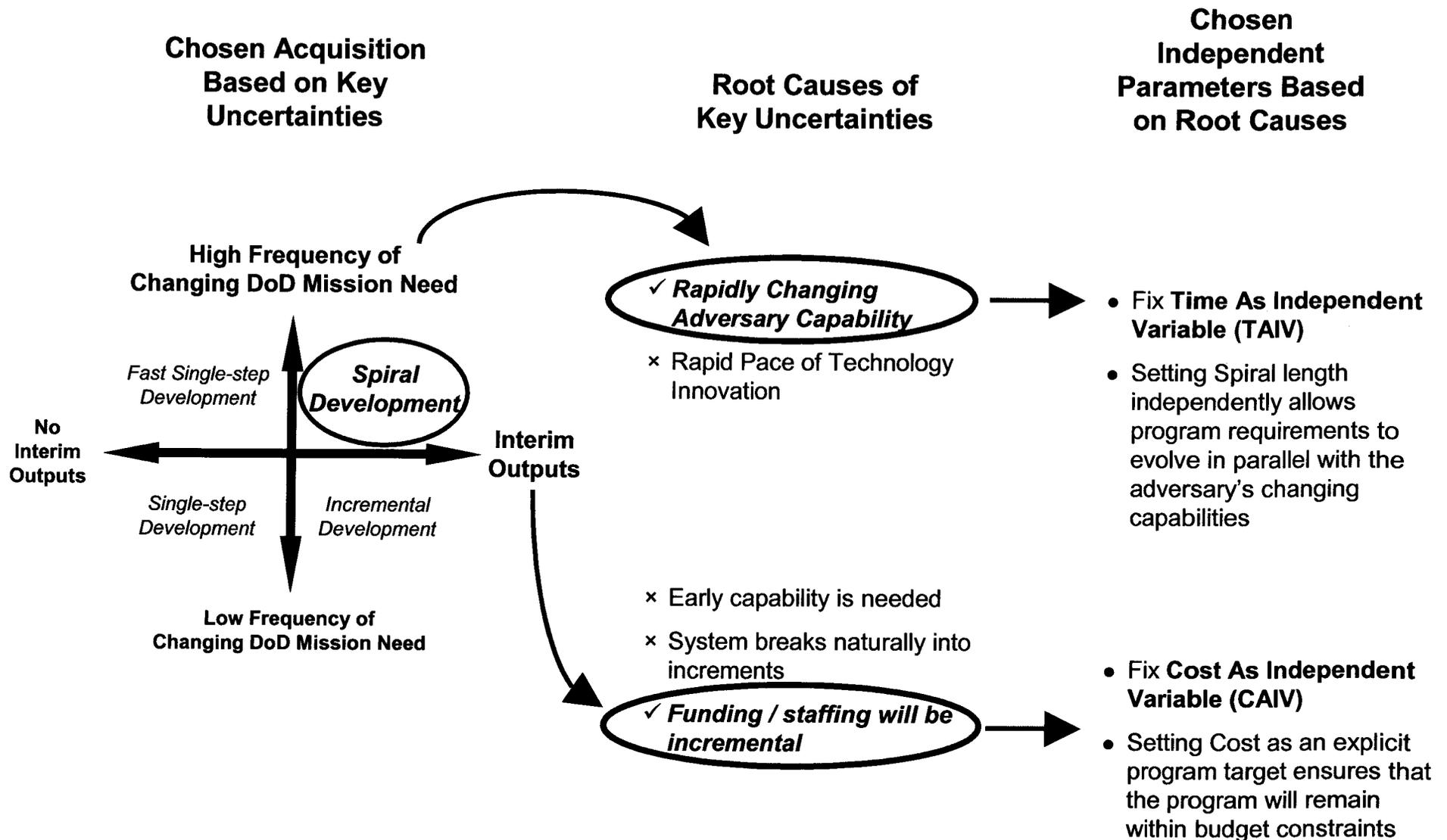
Choosing an Acquisition Strategy

Understanding critical uncertainties is helpful in selecting an appropriate acquisition strategy for improving a program's chance for success



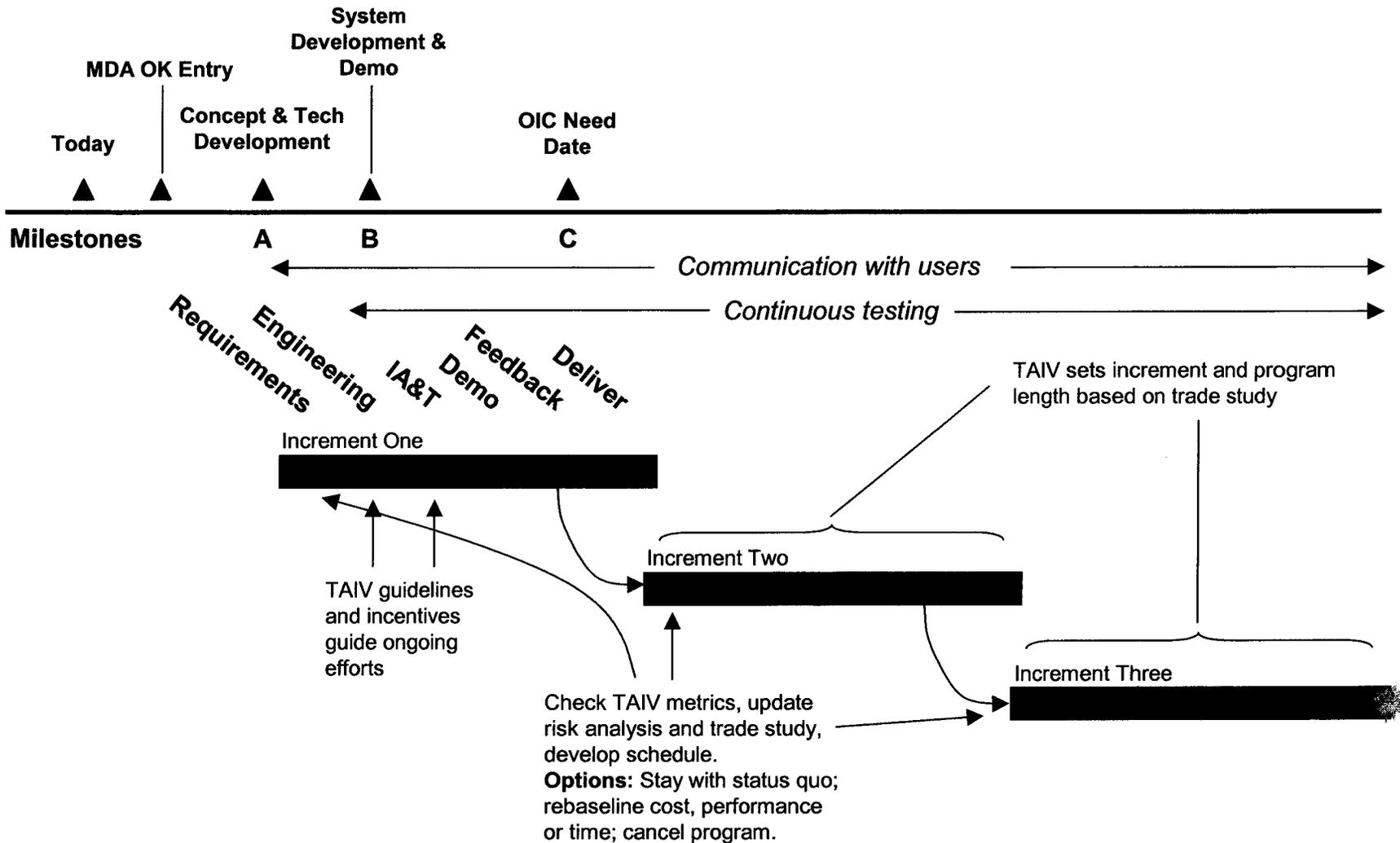
Understanding the Root Causes of Key Uncertainties

Root causes help determine the choice of parameters to fix during planning



Example – Applying TAIV to an Incremental Development Program

Instead of schedule becoming a result, time is traded with cost and performance in an ongoing planning cycle



Agenda

- Context
- Monitor Perspective on Use of TAIV as a Program Management Tool
- The Acquisition Process as Uncertainty Management
- A Framework for Applying TAIV to Program Acquisition Strategies

• Enhancing Program Success with TAIV - Some Examples

- A Contract Framework to Incentivize Contractors to Meet Time Requirements
- Summary

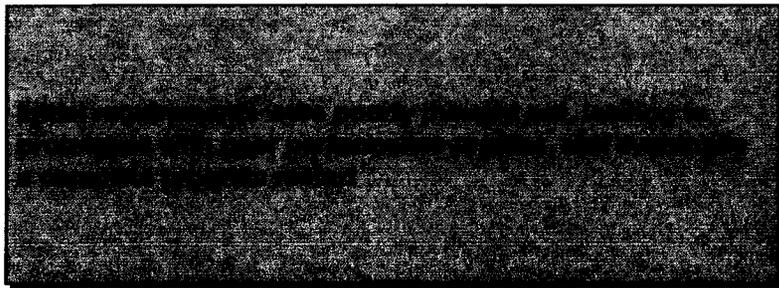
Applicability of TAIV to Selected Programs

Land Warrior

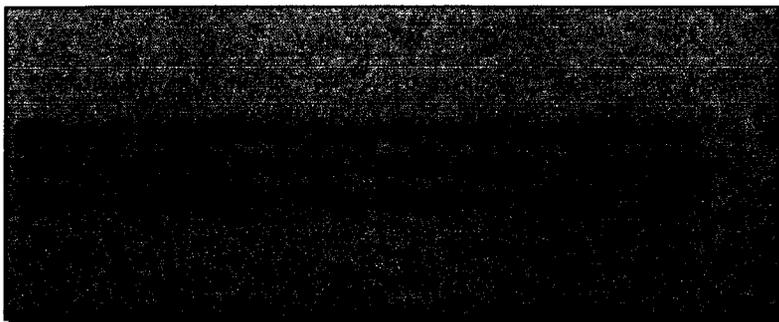
Analyzing key uncertainties facing the program would have led to a more iterative approach using more mature technology

- The Army's Land Warrior program is an integrated combat system based around the individual, dismounted soldier that also integrates the soldier into a wider command and control system
 - Program was initiated in 1994 and slated to begin operational testing in 1998; problems with prototypes in 1998 led to program halt and complete review
 - The original contractor was on path to deliver an extremely expensive system with significant human factors problems. They were replaced by a team of Silicon Valley firms who quickly generated an initial prototype based on COTS technologies, and then received the go-ahead to develop the final product
- Land Warrior is a large, complex program with five subsystems that present non-trivial integration problems

Selected Program Challenges



Hypothesized Impact of TAIV



Applicability of TAIV to Selected Programs

Advanced Extremely High Frequency Communications Satellite

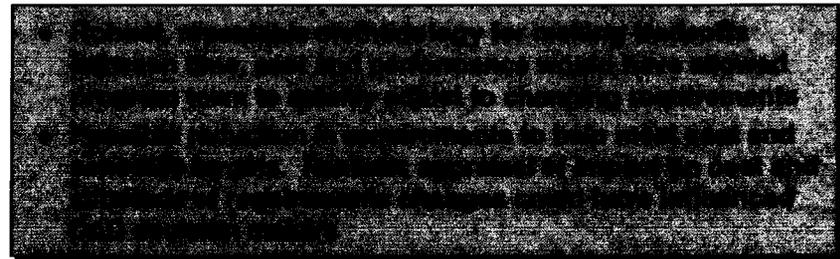
Explicit analysis of time requirements and technology readiness could have led to an earlier recognition of the need for an "interim MILSTAR, and re-evaluation of specified performance

- The Advanced Extremely High Frequency Communications Satellite (AEHF) is a satellite system intended to replace the existing Milstar system and to be DoD's next generation of higher speed, protected communications satellites
 - Originally planned to produce 5 satellites at a cost of \$5.4 billion, currently planned to produce 3 satellites at a cost of \$4.8 billion
 - Significant uncertainty around the December 2006 deliverable date
- Satellites' unique, essential capabilities and inevitable obsolescence make time to deliverable crucial. However, DoD's efforts at schedule-based planning to date have not been effective. TAIV's time-based planning would have helped managers make better-informed tradeoffs, and incentivized them to do so

Selected Program Challenges



Hypothesized Impact of TAIV



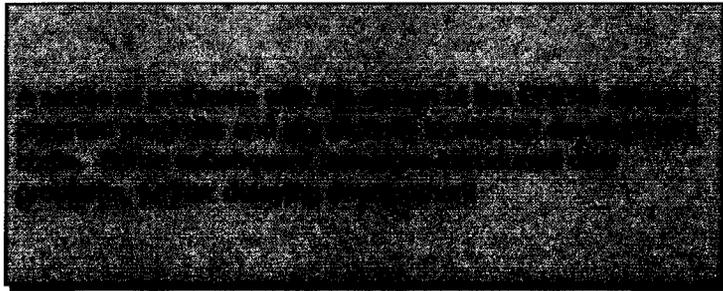
Applicability of TAIV to Selected Programs

Extended Range Guided Munition

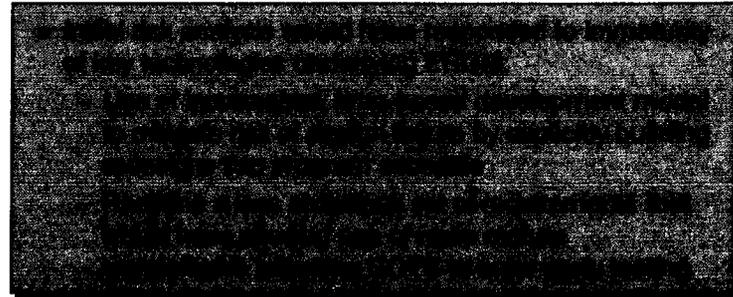
Performing a risk analysis using time would have identified immaturity of underlying technology, this could have been responded to by building redesigns into the program schedule

- The Extended Range Guided Munition (ERGM) is a precision-guided munition that uses a coupled GPS and inertial navigation guidance system to steer the projectile to the pre-selected payload expel/dispense point. The ERGM is designed to provide highly responsive precision engagement of threats to U.S. Marine Corps or U.S. Army ground combat forces operating ashore
 - Development costs have increased 316% since program initiation, unit procurement costs 262%
 - Development time has increased by 147% since program initiation
- “In October 2003, the Navy issued a solicitation for alternative precision-guided munition concepts that could be a complement or competitor to ERGM. In particular, the Navy is concerned about the unit costs of the ERGM round and is looking to develop alternatives that could increase cost savings.” – GAO

Selected Program Challenges



Hypothesized Impact of TAIV



Agenda

- Context
- Monitor Perspective on Use of TAIV as a Program Management Tool
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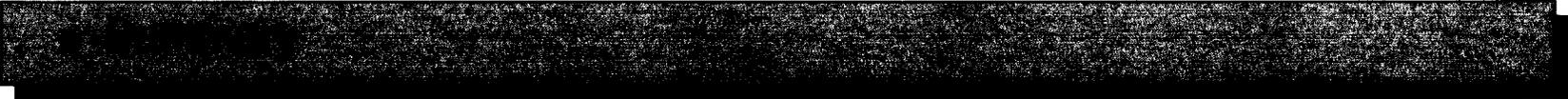
• A Detailed Perspective to Incorporate Concepts to Meet Time Requirements

- Summary



*Program of questionable
value – continue?*

Agenda

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- 

Summary

- Of the three traditional acquisition measures (Cost, Performance & Schedule), Schedule has often been a de facto outcome based on desired performance and/or cost
- We believe that using time as an independent variable similar to CAIV can help manage uncertainties associated with the acquisition process, increase schedule credibility and reduce cost uncertainties
- Time as an Independent Variable (TAIV) is not the same as a fixed schedule for development. TAIV is a *tool* that planners can use to perform trades that improve successful management of uncertainties related to time
- 5000.2 provides a framework with sufficient latitude to incorporate TAIV
- Institutionalizing TAIV can provide an additional tool to support the implementation of incentives that influence contractor and program manager behavior
- TAIV:
 - Is applicable to all three acquisition strategies
 - Aids in selecting Acquisition Strategy
 - Adds creditability to program planning & scheduling
 - Adds a tool to support 5000.2
 - Benefits both DoD and industry
- The benefits of adding TAIV to the acquisition methodology warrant further study

Acquisition Reform Idea

Ground Based Training System (GBTS)

Why Services Prefer to Bundle



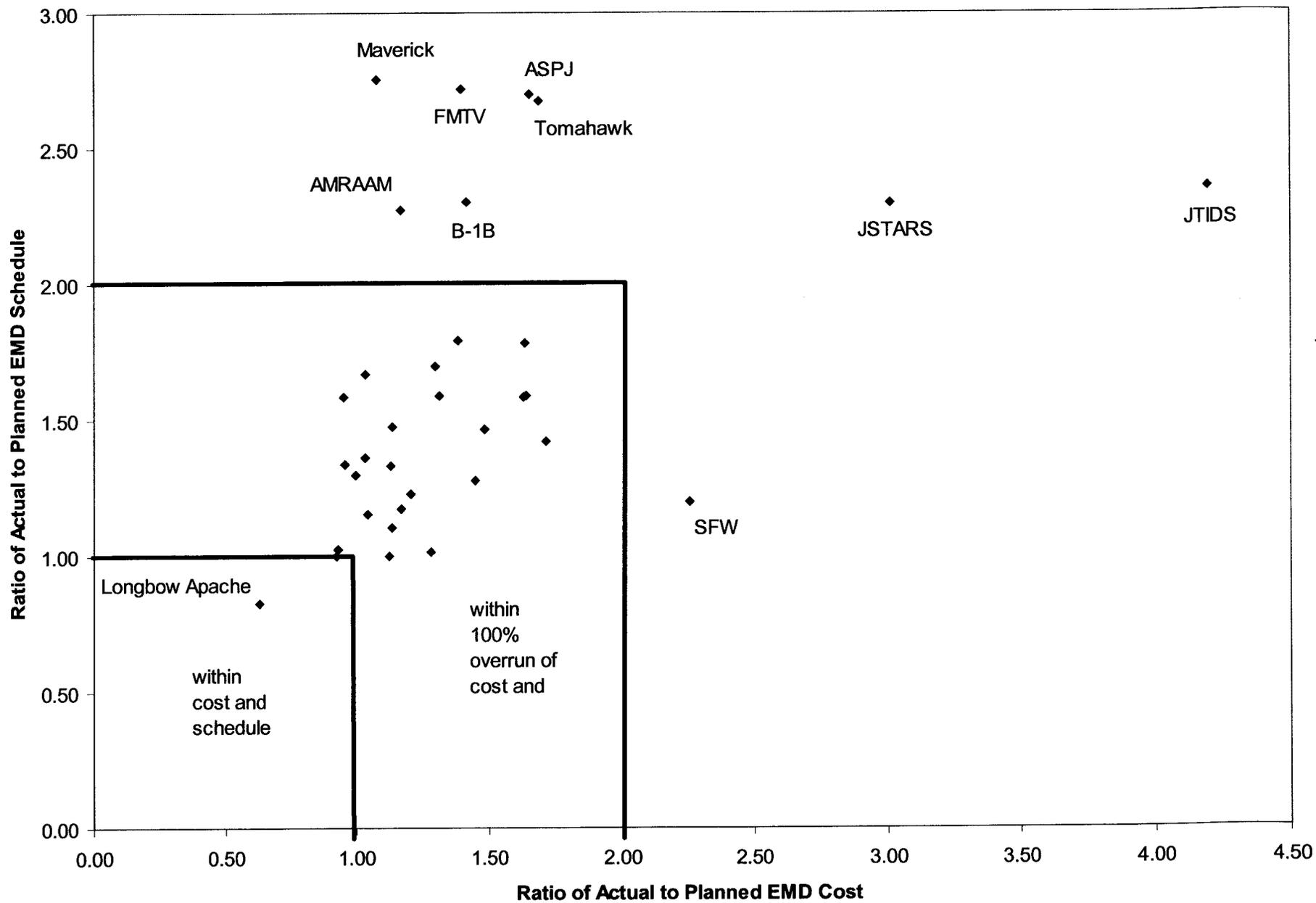
A More Competitive/Economical Approach



It Is a Win – Win - Win

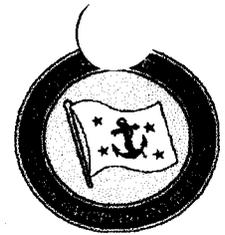


Ratio of Actual to Planned EMD Cost and Schedule





Department of the Navy



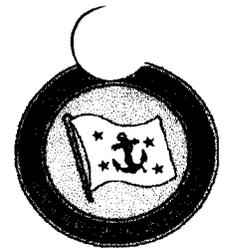
Top Recommendations for Acquisition Process Improvement

August 3, 2005

**RDML Martin Brown
Deputy Assistant Secretary of the Navy
(Acquisition Management)**



Acquisition Process Improvement Avenues Pursued



December 2004

CSIS Beyond Goldwater-Nichols:

U.S. Government and Defense Reform for a New Strategic Era, Phase 2

Defense Science Board

Task Force on Management Oversight in Acquisition Organizations

Defense Science Board

2005 Summer Study on Transformation: A Progress Assessment
Sub-Panel on Industry and Acquisition

Defense Science Board

2005 Summer Study on Transformation: A Progress Assessment
Sub-Panel on DoD Business Practices

QDR

IPT 6: DoD Authorities

DEPSECDEF

Tasking to VADM Tracey (Ret)

QDR

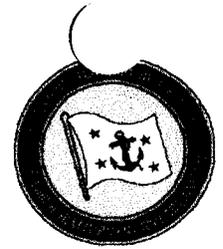
IPT 5: Business Practices / Processes
Acquisition and Support Working Group

August 2005

Defense Acquisition Performance Assessment Project



Top Recommendations



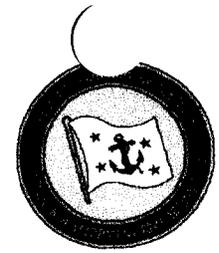
1. Improve Requirements process

Make the hard decisions regarding wants vs. needs vs. affordability earlier in the process.

- **Establish a relative value for each capability**
How much is it worth?
- **Require acquisition participation in early stages**
What are the various ways it could be bought?
- **Establish Service incentives for leveraging**
 - Other services' programs
 - Existing systems
 - Commercial systems*Avoid repetitive development*



Top Recommendations



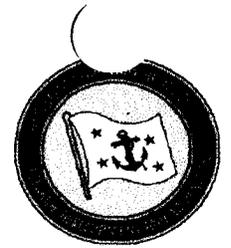
2. Improve Program Stability

Establish a good plan and stick to it.

- **Fund programs in accordance with leadership decisions (e.g. to CAIG estimate)**
Resource the decision
- **Require priced estimates of major risk occurrences**
Ensure awareness of “most probable cost” vice “most optimistic cost”
- **Improve program formulation**
 - **Have acquisition participation earlier in POM process**
 - **Provide additional resources in program formulation phase***Have a good plan*



Top Recommendations



3. Simplify the process

Replace oversight with accountability.

– **Combine the MDAP & MAIS processes**

- **Increase MAIS thresholds to align with MDAP**

Use one process, fully use delegation authorities

– **Reduce documentation requirements**

Record agreements, not methods

– **Increase delegation of MDA & Program Execution**

- **ACAT ID to IC post 1st DAB**

Manage by exception

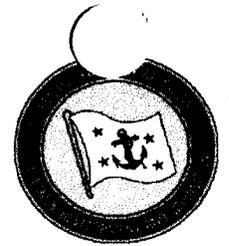
– **Reduce Policy proliferation**

- **Require Business Case**

Understand the impact before enacting



Top Recommendations



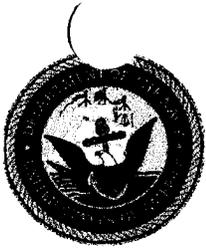
4. Balance the Acquisition Portfolio *Align the Big "A" Decision Processes*

- **Establish Strategic Portfolio Management Capability**
 - Establish Programming, Requirements, Acquisition Tripartite
 - Develop multiple portfolio views
 - Assess portfolio and recommend changes*Provide the insight to make the hard decisions*

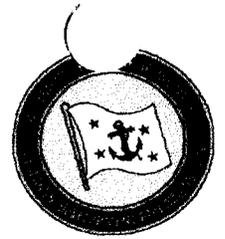
- **Track Budget and Requirements decisions**
Distinguish between big "A" vs. little "a"

- **Streamline periodic reporting**
 - Measure APB Outcome Performance*Manage by exception*

- **Measure Process Performance**
 - Conduct value stream analysis & Lean Six Sigma*Continually improve the process*



Top Recommendations



5. Improve and Strengthen Acquisition Workforce *Empower people to adapt the process to the situation*

- **Workforce sizing and renewal**
Ensure the right number, the right skills, continuity of human capital
- **Ensure sufficient land force contingency contracting structure to perform the existing reconstruction and likely future ground force missions**
Establish as Army core capability