THE DoD ACQUISITION/TEST PROCESS

WHAT WENT WRONG?

and

HOW TO FIX THE PROCESS

Charles “Pete” Adolph

WHAT HAPPENED?

- Congressional Cuts:
  - DoD Acquisition Personnel
  - T&E Budgets
- Faulty implementation of acquisition reform initiatives
  - Overemphasis on commercial products, practices
  - De-emphasis/elimination of Mil Specs, standards
  - Elimination of reliability growth requirement
  - Reduced government personnel and oversight
- Contractual practices
  - Use of contractual vehicles which minimize Government oversight
  - Limited Government access to data and models
- Frequent Rotation of Senior Government Managers
  - Tenure too short to deal with consequences of poor decisions
- Impact of Wars on Military positions and funding

WHAT HAPPENED(Continued)

- Acquisition process lost discipline and stability
- Slogan-based processes
  - Simulation-based
  - Performance-based
  - Capability-based
  - Effects-based

Service Acquisition/Test Workforce Changes

Army

- Designated Government DT as discretionary
- Essentially eliminated military test cadre

Navy

- Reduced personnel levels 10%
- No shift from Government hands-on DT

Air Force

- Trend is to give DT&E conduct, control to OEM
- Test personnel levels decreased 15%
- Engineering workforce reduced as much as 60%
- Government evaluation, reporting deemphasized

OSD Test Oversight Changes

- No significant change to DOTE
- DDT&E organization dismantled in 1999
  - No effective oversight of DT programs, practices, workforce training
  - Live Fire Testing moved to DOTE
  - Foreign Comparative Testing to DDR&E
  - Test Capabilities and Resources to DOTE, then TRMC

Aggregate Effects of Changes
Quantifiable Consequences

- Inadequate Requirements Definition
  - Increased Requirements Turbulence
  - Testability considerations deemphasized
- Inadequate attention to technology readiness
- Unprecedented cost overruns, Nunn-McCurdy breaches
- Developmental Timelines increased; unprecedented schedule slips
- Dramatic increase in suitability failure rates
  - Adversely impacts system availability
  - Increases sustainment costs
- Production increments increasingly funded prior to IOT&E or adequate DT

DoD IOT&E Results

Program	Service	ACAT	IOT&E Result		Reason
FY 2001					
F-15 TEWS	USAF	II	Effective	Not Suitable	Reliability, Maintainability, Availability
V-22 Osprey	Navy	1D	Effective	Not Suitable	Reliability, Availability, Maintainability (RAM), Human Factors, BIT
Joint Direct Attack Munitions (JDAM)	USAF	1C	Effective only with legacy fuses	Not Suitable	Integration with delivery platforms
M2A3 Bradley Fighting Vehicle	Army	1D	Effective	Suitable	
FY 2002					
Joint Primary Aircraft Training System (JPATS)	USAF	1C	Effective with deficiencies	Not Suitable	RAM, Safety, Human Factors
Cooperative Engagement Capability (CEC)	Navy	1D	Effective	Suitable	
Multiple Rocket Launcher System (MLRS)	Army	1C	Effective	Suitable	
MH-60S	Navy	1C	Effective	Not Suitable	RAM, excessive administrative and logistic repair time impacted RAM
FY 2003					
B-1B Block E Mission Upgrade Program	USAF	1D	Effective	Not Suitable	16% decrease in weapons release rate, reduction in accuracy of Mark 82 low drag weapons, 14% hit rate on moving targets
Sea wolf Nuclear Attack Submarine	Navy	1D	Effective	Suitable	Several requirement thresholds were not met but overall system effective and suitable

Figure 1. DoD IOT&E Results FY 2001-2003.

Program	Service	ACAT	IOT&E Result		Reason
FY 2004					
Evolved Sea sparrow Missile	Navy	II	Effectiveness unresolved	Suitable	Testing was not adequate to determine effectiveness.
Stryker	Army	1D	Effective	Suitable	
Advanced SEAL Delivery System (ASDS)	Navy	1D	Effective with restrictions	Not suitable	Effective for short duration missions; not effective for all missions and profiles. Not suitable due to RAM.
Tactical Tomahawk	Navy	1C	Effective	Suitable	
Stryker Mortar Carrier-B (MC-B)	Army	1D	Effective	Not Suitable	RAM and safety concerns.
FY 2005					
CH-47F Block I	Army	1C	Effective	Not Suitable	RAM; communications system less suitable than CH-47D; did not meet Information Exchange Requirements for Block I.
F/A-22	USAF	1D	Effective	Not Suitable	RAM; needed more maintenance resources and spare parts; BIT
Joint Stand-Off Weapon-C	Navy	1C	Not Effective		Not effective against moderately hardened targets; mission planning time was excessive.
Guided-MLRS	Army	1C	Effective	Suitable	
High Mobility Attack Rocket System (HMARS)	Army	1C	Effective	Suitable	
V-22 Osprey	Navy	1D	Effective	Suitable	
EA-6B (ICAP III)	Navy	II	Effective	Suitable	

Figure 2: DoD IOT&E Results FY 2004-2005.

Program	Service	ACAT	IOT&E Result		Reason
CY 2006					
Common Missile Warning System (CMWS)	Army	1C	Effective	Suitable	Effective and suitable in the OIF/OEF environment but needs further testing outside of the OIF/OEF environment.
Deployable Joint Command and Control (DJC2)	Navy	1AM	Effective	Not Suitable	Operational Test Agency, COTF, reported effective, not suitable. BLRIP not complete.
Integrated Defensive Electronic Countermeasures	Navy	II			Test suspended due to reliability problems.
Surface Electronic Warfare Improvement Program (SEWIP) Block 1A	Navy	II	Not Effective	Not Suitable	Block 1A Upgrade does not make the AN/SLQ-32 EWS operationally effective and suitable but does enhance ability to protect ships
C-130J	USAF	1C	Effective single ship; Not effective in formation	Suitable with shortfalls	Effective single ship; not effective in formation air land / air drop; not effective in non-permissive threat environment. Shortfalls in suitability due to maintainability issues
Small Diameter Bomb (SDB) Increment 1	USAF	1D	Effective with limitations	Suitable with limitations	Limited effectiveness and suitability due to bomb rack reliability and deficiencies in software used to predict optimum fuzing solutions. Oct 2006 flight operations suspended

Figure 3: DoD IOT&E Results for 2006.

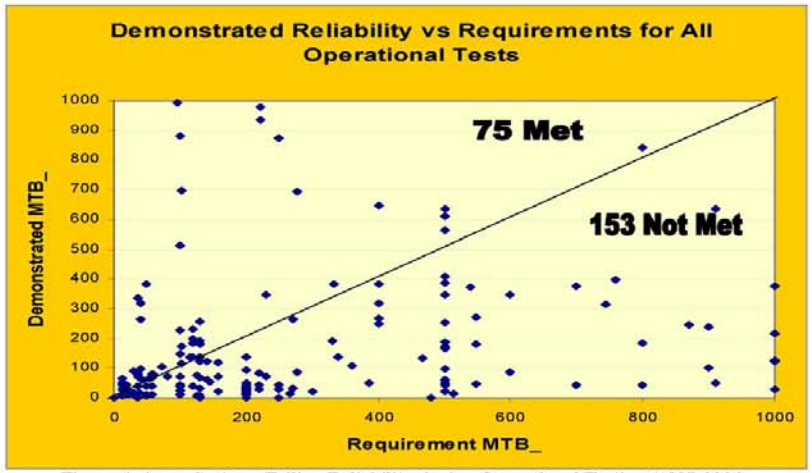
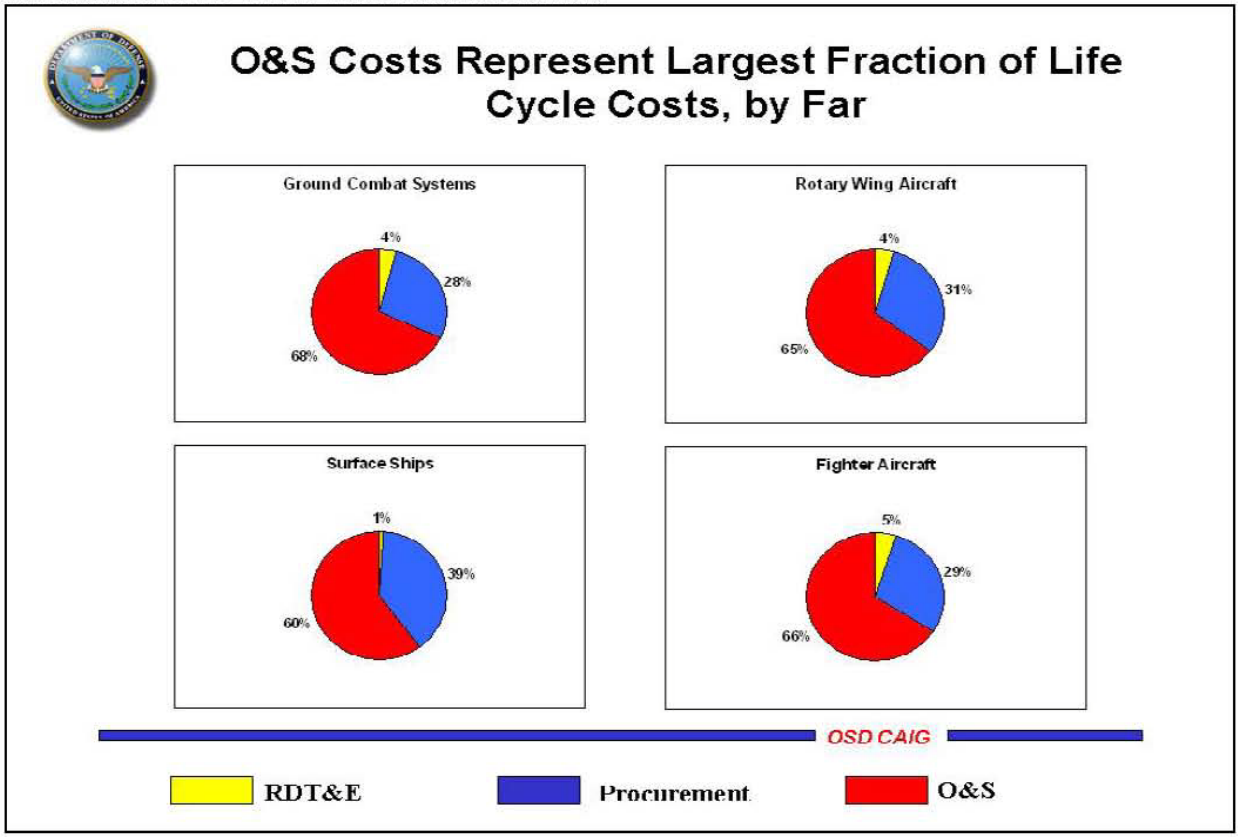


Figure 4: Army Systems Failing Reliability during Operational Testing (1997–2006).

APPENDIX I: OSD CAIG LIFE CYCLE COSTS[35]



[35] Walt Cooper, O&S Trends and Current Issues, OSD PA&E/CAIG, Washington, D.C., May 2007.

Weapons Systems Acquisition Reform Act of 2009 (Public Law 111-23, May 22, 2009

- Senate Armed Services Committee Hearing, 3 March 09
- Acquisition organizational realignments
  - Establishes director of cost assessment
  - Reestablishes director, DT&E
- Some key policy provisions
  - Requires trade-off analyses among cost, schedule, performance
  - Requires prototyping of critical technogies
  - Requires actions to address systemic problems

Weapons Systems Acquisition Reform Act Some Statutory Requirements for DDT&E

- Joint annual report to Congress with direction SE on DT&E & SE activities
- Collaborate with DDR&E on assessment of maturity and integration risk of critical technologies
- TEMP approval
- Review DT&E of major programs
- Develop policy & guidance
  - Conduct of DT&E
  - Collection, archiving test data
- Report on training of service DT&E personnel
  - Mandatory SAE 18 Nov 09 Training report to DDT&E
- Joint Bi-annual effort with TRMC to update T&E resource plan

Remedies: Government Workforce

- Reconstitute experienced & capable Government acquisition workforce: KEY TO ALL OTHER INITIATIVES
  - Contracting personnel
  - Program managers
  - Engineers/Technical staff
    - Domain subject matter experts
    - Systems Engineers
  - T&E Personnel
    - Reconstitute field test organizations as Centers of Expertise to perform RTO function
- Reestablish pipelines (vice sporadic hiring)
- Reconstitute guidance documents
- Augment with expert interservice & FFRDC Teams

Remedies: Requirements Process

- Requirements must adequately define
  - Key attributes which must be verified by test or analysis
  - Requirements must be stated in terms that are measurable, testable, evaluable, reasonable in terms of technology and cost
  - DT community must be involved in definition process to insure testability
- Kaminski National Research Council study excellent roadmap: Paul Kaminski, et al, Pre-Milestone A and Early Phase Systems Engineering: A Retrospective Review and Benefits for Future Air Force Acquisition, National Research Council, 2008
- Reassess emphasis on commercial practices
  - Insure relevance & adequacy of commercial criteria on a case-by-case basis

Remedies: Technology Readiness

- Competitive prototypes where practical
- Prototyping critical technologies with rare exceptions
- Disciplined technology readiness review
- OSD/DDT&E Verification of TRL
  - Insure objectivity by other than technical advocate review

“Fly Before Buy”

- Accelerate Initial Acquisition Development Testing
- Verify technical design throughout normal operating envelope ASAP
- Identify, correct major flaws
- Prevent production of weapons with serious deficiencies; e.g., V-22, JASSM, etc.

Remedies: Reestablish/Reinvigorate Government Tester Involvement

Designate a Test Organization as RTO

- Insure testability/evaluability of requirements
- Develop T&E Strategy
- Scope Contractor Test Program for RFP
- Insure RFP contains requirements for Government access to data and models

- Participate in Source Selection
- Scope Developmental Test Program with OEM
- Periodically Report on DT Program Status
  - Adequacy of test program, test resources
  - Progress against schedule and funding
- Participate in Program technical reviews
- Utilize Red Teams selectively to augment Service evaluators
- “Expert Cadres” for test process improvement/cycle time reduction studies

CONCLUSIONS

WARFIGHTERS, TAXPAYERS DESERVE BETTER PERFORMANCE FROM DOD ACQUISITION COMMUNITY

REQUIRED CORRECTIVE ACTIONS OBVIOUS

SERVICES, OSD COMMITMENT?