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

## Executive Summary

<table>
<thead>
<tr>
<th>Program</th>
<th>Service</th>
<th>ACAT</th>
<th>IOT&amp;E Result</th>
<th>FY 2001 Reason</th>
<th>FY 2002 Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-15 TIEWS</td>
<td>USAF</td>
<td>11</td>
<td>Effective</td>
<td>Not Suitable</td>
<td>Reliability, Maintainability, Availability</td>
</tr>
<tr>
<td>V-22 Osprey</td>
<td>Navy</td>
<td>1D</td>
<td>Effective</td>
<td>Not Suitable</td>
<td>Reliability, Availability, Maintainability</td>
</tr>
<tr>
<td>Joint Direct Attack Munitions (JDAM)</td>
<td>USAF</td>
<td>1C</td>
<td>Effective</td>
<td>Not Suitable</td>
<td>Integration with delivery platforms</td>
</tr>
<tr>
<td>M2A3 Bradley Fighting Vehicle</td>
<td>Army</td>
<td>1D</td>
<td>Effective</td>
<td>Suitable</td>
<td></td>
</tr>
<tr>
<td>Joint Primary Aircraft Training System (JPATS)</td>
<td>USAF</td>
<td>1C</td>
<td>Effective</td>
<td>Not Suitable</td>
<td>RAM, Safety, Human Factors</td>
</tr>
<tr>
<td>Cooperative Engagement Capability (CEC)</td>
<td>Navy</td>
<td>1D</td>
<td>Effective</td>
<td>Suitable</td>
<td></td>
</tr>
<tr>
<td>Multiple Rocket Launcher System (MLRS)</td>
<td>Army</td>
<td>1C</td>
<td>Effective</td>
<td>Suitable</td>
<td>RAM, excessive administrative and logistic repair</td>
</tr>
<tr>
<td>MH-60S</td>
<td>Navy</td>
<td>1C</td>
<td>Effective</td>
<td>Not Suitable</td>
<td>repair time impacted RAM</td>
</tr>
<tr>
<td>E-18 Block E Mission Upgrade Program</td>
<td>USAF</td>
<td>1D</td>
<td>Effective</td>
<td>Not Suitable</td>
<td>15% decrease in weapons release rate, reduction in</td>
</tr>
<tr>
<td>Sea wolf Nuclear Attack Submarine</td>
<td>Navy</td>
<td>1D</td>
<td>Effective</td>
<td>Suitable</td>
<td>accuracy of Mark 52 low drag weapons, 16% hit rate</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Program</th>
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<th>IOT&amp;E Result</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evolved Sea Sparrow Missile</td>
<td>Navy</td>
<td>11</td>
<td>Effective</td>
<td>Testing was not adequate to determine effectiveness</td>
</tr>
<tr>
<td>SpyNet</td>
<td>Army</td>
<td>1D</td>
<td>Effective</td>
<td>Not Suitable</td>
</tr>
<tr>
<td>Advanced SEAL Delivery System (ASDS)</td>
<td>Navy</td>
<td>1D</td>
<td>Effective</td>
<td>Not suitable, effective with restrictions</td>
</tr>
<tr>
<td>Tactical Tomahawk</td>
<td>Navy</td>
<td>1C</td>
<td>Effective</td>
<td>Suitable</td>
</tr>
<tr>
<td>Strelka Mortar Carrier-B (MC-B)</td>
<td>Army</td>
<td>1D</td>
<td>Effective</td>
<td>Not Suitable, RAM and safety concerns</td>
</tr>
<tr>
<td>CH-47F Block 1</td>
<td>Army</td>
<td>1C</td>
<td>Effective</td>
<td>Not Suitable, RAM communications system less suitable than CH-47F; did not meet Information Exchange Requirements for Block 1</td>
</tr>
<tr>
<td>F/A-22</td>
<td>USAF</td>
<td>1D</td>
<td>Effective</td>
<td>Not Suitable, RAM; needed more maintenance resources and spare parts; BIT</td>
</tr>
<tr>
<td>Joint Stand-Off Weapon-C</td>
<td>Navy</td>
<td>1C</td>
<td>Not Effective</td>
<td>Not effective against moderately hardened targets, mission planning time was excessive.</td>
</tr>
<tr>
<td>Guided-MLRS</td>
<td>Army</td>
<td>1C</td>
<td>Effective</td>
<td>Suitable</td>
</tr>
<tr>
<td>High Mobility Attack Rocket System (HMARS)</td>
<td>Army</td>
<td>1D</td>
<td>Effective</td>
<td>Suitable</td>
</tr>
<tr>
<td>V-22 Osprey</td>
<td>Navy</td>
<td>1D</td>
<td>Effective</td>
<td>Suitable</td>
</tr>
<tr>
<td>EA-6B (ICAP III)</td>
<td>Navy</td>
<td>11</td>
<td>Effective</td>
<td>Suitable</td>
</tr>
</tbody>
</table>

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

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<thead>
<tr>
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<th>Service</th>
<th>ACAT</th>
<th>OT&amp;E Result</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Missile Warning System (CMWS)</td>
<td>Army</td>
<td>1G</td>
<td>Effective</td>
<td>Suitable</td>
</tr>
<tr>
<td>Deployable Joint Command and Control (DJCC)</td>
<td>Navy</td>
<td>1A</td>
<td>Effective</td>
<td>Red</td>
</tr>
<tr>
<td>Integrated Airborne Electronic Countermeasures</td>
<td>Navy</td>
<td>2</td>
<td>Not Suitable</td>
<td>Red</td>
</tr>
<tr>
<td>Surface Electronic Warfare Improvement Program (SEWIP) Block 1A</td>
<td>Navy</td>
<td>3</td>
<td>Not Effective</td>
<td>Red</td>
</tr>
<tr>
<td>E-135</td>
<td>USMF</td>
<td>1C</td>
<td>Effective single ship, not effective in formation</td>
<td>Suitable with limitations</td>
</tr>
<tr>
<td>Small Diameter Bomb (SDB)</td>
<td>USMF</td>
<td>1D</td>
<td>Effective with guidance</td>
<td>Suitable with guidance</td>
</tr>
</tbody>
</table>

Figure 3: DoD IOT&E Results for 2006.

**Demonstrated Reliability vs Requirements for All Operational Tests**

<table>
<thead>
<tr>
<th>Demonstrated MTB</th>
<th>Requirement MTB</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 Met</td>
<td></td>
</tr>
<tr>
<td>153 Not Met</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Army Systems Failing Reliability during Operational Testing (1997-2006).
O&S Costs Represent Largest Fraction of Life Cycle Costs, by Far

- **Ground Combat Systems**
  - RDT&E: 4%
  - O&S: 28%
  - Procurement: 68%

- **Rotary Wing Aircraft**
  - RDT&E: 4%
  - O&S: 31%
  - Procurement: 65%

- **Surface Ships**
  - RDT&E: 1%
  - O&S: 39%
  - Procurement: 60%

- **Fighter Aircraft**
  - RDT&E: 5%
  - O&S: 27%
  - Procurement: 68%

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- 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 technologies
  - 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


- 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?