Testing Doesn't Cost – It Pays

OT&E/DT&E response to
Acquisition – T&E Relationships
Assessment Report
April 2011

http://www.dote.osd.mil/pub/presentations.html

Reported Root Causes & Mitigation Areas

- **Weak linkage amongst Requirements, Program, and Test Communities**
- **Issues with Requirements Setting and Management**
- **Acquisition Strategy – Test Strategy Misalignment and TEMP Management**
- **The "Tail End Charlie" Syndrome**
- **Troubled Programs**

Test community agrees with report's conclusions:

"The Task Team found no significant evidence that the testing community typically drives unplanned requirements, cost or schedule into programs."

Mitigations Currently in Work

- **Promote early, effective, frequent communication at working level**
  - IPTs, Working Groups and “Core Teams” with PMs, User Reps, System Engineers, DT & OT
- **Evaluate systems vs. requirements and broader mission context**
  - Testing to evaluate systems’ mission accomplishment despite Program Office desire to have their system evaluated in isolation
  - DT&E example: F-22 Increment 3.1 Synthetic Aperture Radar Tests – user input during DT for display and usability of SAR maps
  - OT&E example: USS *Virginia* – did not meet KPPs but was evaluated as effective
- **Discourage stalemates & Elevate issues earlier**
  - DOT&E policy for Early Review of TEMPs and Test Plans before coordination cycle begins
  - DT&E Early and Continuous Engagement (RFP to IOT&E)
- **Plan appropriate scope of testing to identify deficiencies early**
  - Rational, analytical approach to support test sizing
  - Recent examples include SDB II, JASSM, JATAS

Mitigations Planned for Action

- **TEMP at Milestone A**
  - Earlier insight into test resource requirements
  - Sets baseline for smoother TEMP approval prior to MS B
- **TEMP update flexibility**
  - Especially important for IT systems
  - Current coordination process averages ~6 months
- **Realistic expectations at requirements definition**
  - Testers provide feedback on testability of requirements
  - KPP list must consider the “so what?” factor
  - Trades for affordability – accepted risk
  - Requirements change frequently is a *symptom* – not a *cause* – of program delay
    - GAO Report 11-233SP found that programs with decreased, deferred, or deleted requirements had 40% schedule increase compared to 8% increase for those programs with no change in requirements

Point of Disagreement: “Giving a Grade”

- **Developmental testing characterizes performance**
  - DT Assessment of Operational Test Readiness (AOTR) is a “progress report”
  - Provided to AT&L, SAE, and DOT&E

- **Operational testing WILL provide a grade:**
  - Sometimes we have to call the baby ugly
  - Assures fighting forces and combat developers that the system can be used in combat
  - Required by law
  - However, it is an OPEN BOOK exam

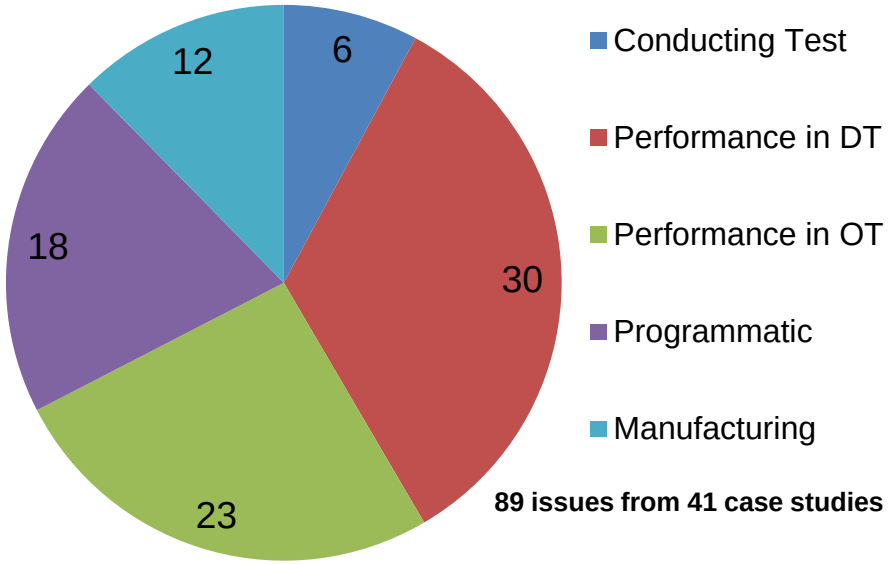
Reasons Behind Program Delays

- **Case studies of 41 current major programs with significant delays[1]**
  - More than half of the programs had their FRP delayed more than two years
  - All programs had a least one year delay in a major milestone
- **Two-thirds of the programs had performance issues in DT**
  - More than half of those programs had performance issues in OT as well as poor performance in DT
- **Performance problems *discovered* in testing as opposed to problems *with testing* caused majority of delays**

1. "Reasons Behind Program Delays," briefing, Institute for Defense Analyses, 30March2011

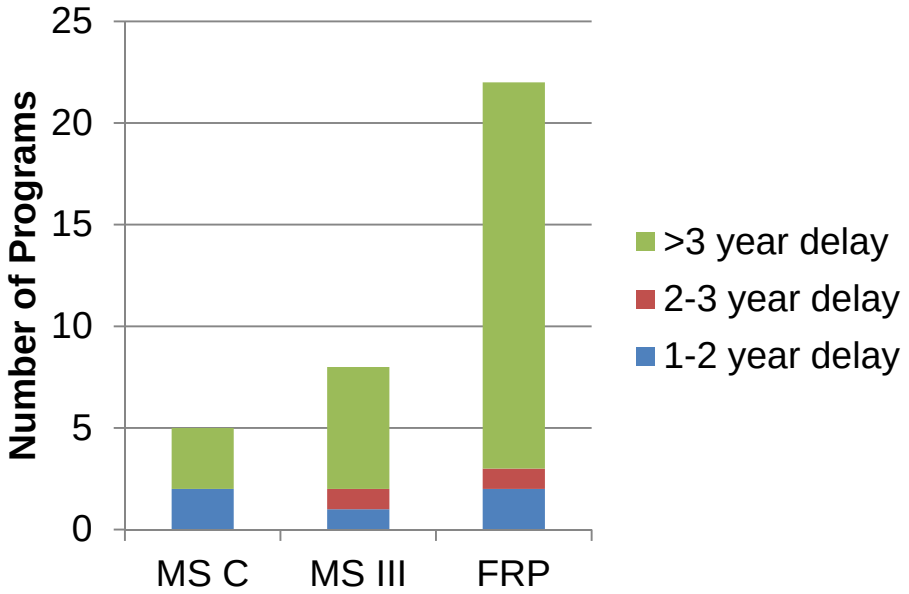
Reasons Behind Program Delays

"T&E cost issues in a program are typically the result of under-estimating the impact of system complexity; inadequate cost estimating; and/or/ inadequate/immature engineering."



- 41 selected case studies showed 89 instances of issues in five categories resulting in delays

- Six of these programs had delays because of test issues. In no case, were the test issues the primary causes of overall delay.



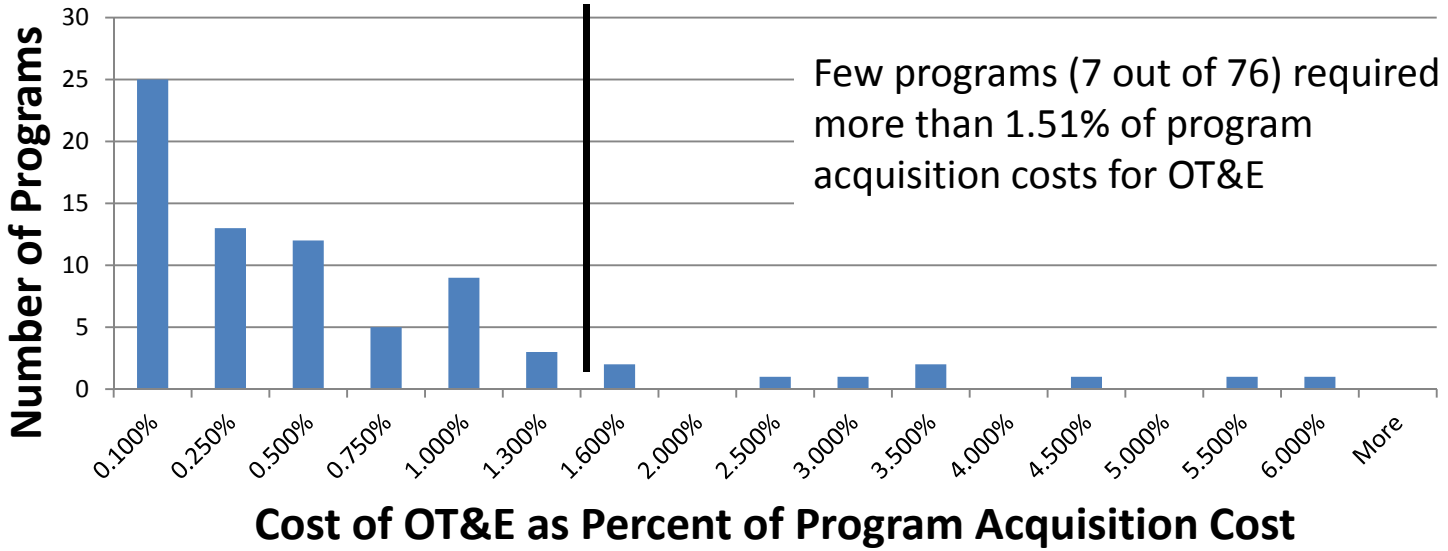
- 36 case studies had a major milestone delay over 1 year; 22 of these were more than 3 years

- 5 other cases delayed fielding or were canceled

Cost of OT Relative to Program Cost

"…the cost of [testing] is a small portion of the overall program budget; it is a large percent of the budget in the year(s) in which it occurs.

- Review of 76 recent programs
- Average marginal OT&E cost was 0.65%
- Low Program Acquisition Cost is dominant source of high relative OT&E cost
- Expense of test articles and their expendability is a major driver



OT&E is usually 1% ± 0.5% of Program Acquisition Cost

Backups

Listing of programs examined from “Reasons Behind Program Delays,” briefing, Institute for Defense Analyses, 30March2011 .

Program	Delay	Manufacturing	Programmatic	Performance Problems in DT	Performance Problems in OT	Problems in Conducting Test	Problem Observed Conducting Test
Joint Strike Fighter	FRP delayed 3 years	1	1	1			
P-8A Poseidon	MS C delayed 18 months	1				1	improper instrumentation during DT
AIM-9X 8.212	OT completion delayed 18 months			1	1		
AARGM	FRP delayed over 2 years	1		1	1		
CIRCM	FRP delayed 4 years			1			
IDECM Block 3	FRP delayed 5 years	1		1	1		
LAIRCM Phase II	FRP delayed over 4 years		1	1			
SIRFC	FRP delayed over a year	1	1	1	1		
AOC-WS 10.1	Fielding delayed one quarter			1			
MIDS JTRS	FRP delayed about a year	1		1	1		
Mark XIIA Mode 5	FRPD delayed 3 years			1	1		
DoN LAIRCM	MS C delayed a year		1		1		
MALD	IOT&E delayed over 3 years			1	1	1	range availability
B-2 RMP	FRP delayed 2 years	1					
RMS	FRP delayed 9 years		1	1	1		
ALMDS	FRP delayed 4 years			1			
MH-60S Block 2A AMCM	FRP delayed over 4 years			1	1		
AMNS	FRP slipped over 6 years			1			
LPD 17	MS III delayed 3 years	1			1	1	targets
SM-6	FRP delayed a year			1		1	telemetry
LCS	FOC delayed a year	1	1				
Virginia	MS III delayed 2 years	1	1	1	1	1	targets
DDG 1000	MS B rescinded		1				
CH-47F	FRP delayed 3 years		1	1	1		
AH-1Z	FRP delayed over 4 years	1		1	1		
VTUAV	IOT&E delayed 3 years			1			

Program	Delay	Manufacturing	Programmatic	Performance Problems in DT	Performance Problems in OT	Problems in Conducting Test	Problem Observed Conducting Test
Spider Networked Munition	FRP delayed 6 years				1		
Precision Guidance Kit (PGK)	MS C delayed 4 years			1			
Excalibur Increment Ia-2	FRP delayed over 2 years		1	1			
PIM	MS C delayed 3 years		1	1			
JLTV	MS C delayed over 2 years		1	1			
E-IBCT	3 of 5 systems cancelled			1	1		
JTRS HMS Rifleman Radio	MS C, FRP delayed 2 years			1	1		
Gray Eagle	FRP delayed over 2 years		1		1		
Stryker MGS	FRP delayed over 3 years	1			1		
Net-Centric Enterprise Services	FRP delayed 2 years		1		1	1	lack of user base
NPOESS	FRP delayed 2 years		1	1			
GCCS JOPES 4.2 and 4.2.1	Fielding delayed 2 years			1	1		
CITS AFNet Increment 1	Fielding delayed 2 years		1	1	1		
Patriot PAC-3	FRP delayed 15 years		1		1		
MEADS	LRIP delayed 9 years		1	1			