



# Developmental Test & Evaluation

Presented to 2011 ITEA Symposium  
*“Fostering Partnerships in T&E and Acquisition”*

Edward Greer  
Deputy Assistant Secretary of Defense, Developmental Test & Evaluation  
Director, Test Resource Management Center

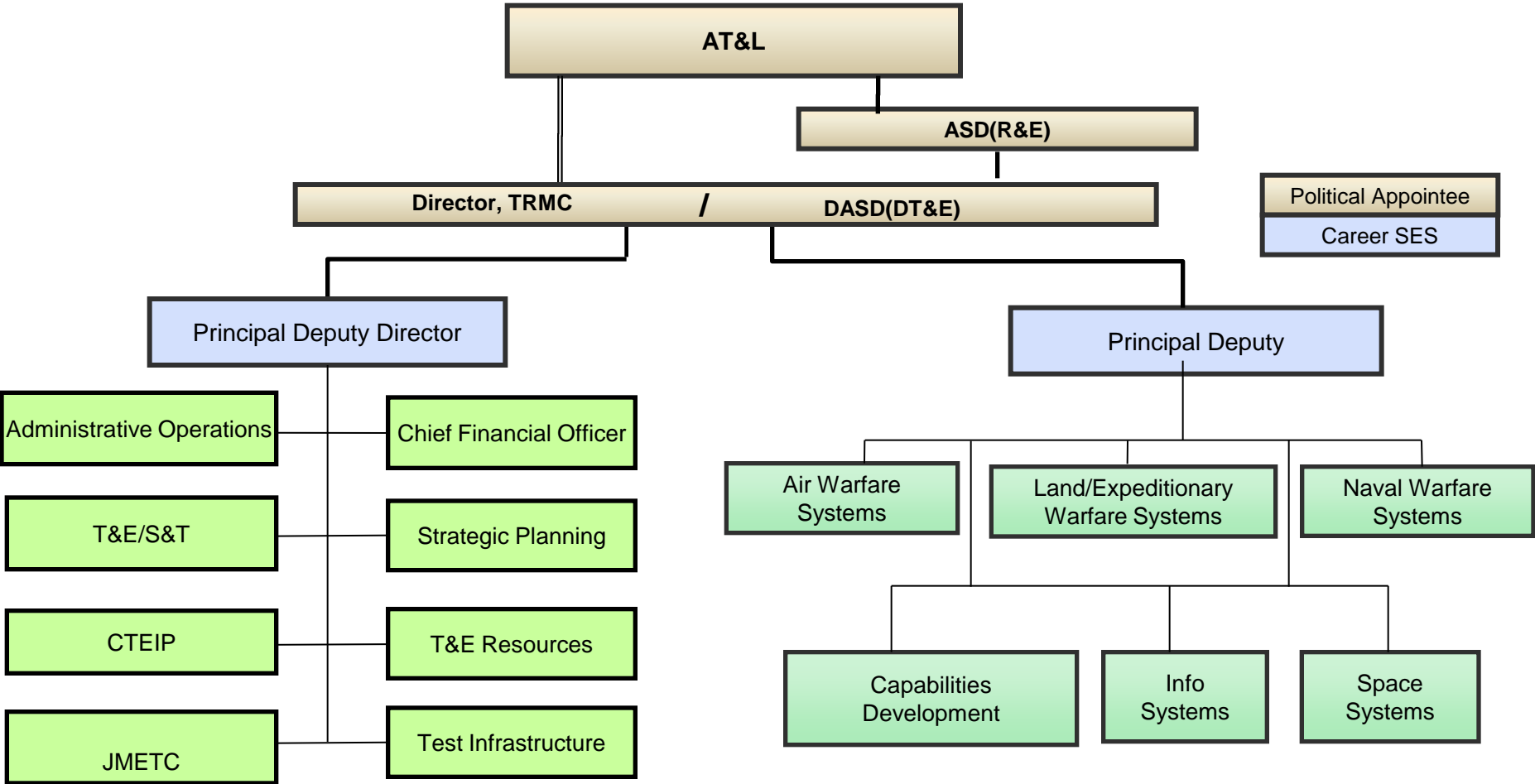
September 12-15, 2011

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# Developmental Test & Evaluation (DT&E) Test Resource Management Center (TRMC) Organizational Construct





# TRMC Initiatives



- **Concurrent service as Director, TRMC**
  - DASD(DT&E) is also D, TRMC effective April 1, 2011
  - But Staffs have **NOT** merged!
- **90-Day Study underway**
- **Cyber T&E Vision**
- **MRTFB Charge Policy Revision Study Team**
- **Inter-Agency Partnerships**
- **Budget Certification Reports**
- **Biennial Infrastructure Review**



# Budget Certification Report

## FY12 Update and FY13 Process



- **TRMC certified Component FY12 T&E budgets**
  - Jan 11 – Army / AF reduced T&E budgets \$99.6M and \$103.8M respectively
  - SecDef response is in work (Non-certify; mitigation plans)
- **FY13 Budget Certification Process has begun**
  - USD (Comptroller): “Halt development of budget justification materials pending new guidance”
- **TRMC Program/Budget Review will be affected**

Per Title 10, if TRMC non-certifies a budget the SecDef must notify Congress and describe the corrective actions to be implemented

**DoD Budget Volatility can be expected**



# T&E/S&T Program Overview

**112 Active Projects**

- Established in FY02
  - Joint DDR&E / DOT&E Initiative
- RDT&E Budget Activity 3 funds
- Purpose
  - High Risk / High Payoff R&D for Testing
  - Foster technology transition to ranges
  - Risk reduction for test capabilities

- Annual Broad Agency Announcements
- Tri-Service working groups
  - Validate requirements
  - Evaluate proposals
  - Facilitate technology transition
- Central Oversight – Distributed Execution

As of 6 June 2011

## Nine Test Technology Areas

**Advanced Propulsion**  
18 Active Projects

**Unmanned & Autonomous Systems**  
8 Active Projects

**Advanced Instrumentation**  
11 Active Projects

**Multi-Spectral Sensors**  
17 Active Projects

**Directed Energy**  
26 Active Projects

**Spectrum Efficiencies**  
19 Active Projects

**Net-Centric Systems**  
13 Active Projects

**Electronic Warfare**  
Re-aligning 6 projects from Multi-Spectral

**Cyberspace Test**  
Re-aligning 2 projects from Net-Centric

FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
\$95.7M	\$97.6M	\$99.6M	\$102.2M	\$103.7M	\$105.4M	\$108.4M

**Shaping Technology into Tomorrow's T&E Capabilities**



# CTEIP Funding Profile PB12 Reductions



(\$ in Millions)

FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
160.4	162.3	140.2	151.5	147.4	147.9	146.4

□ Source: FY2012 President's Budget Submission

Fiscal Year Budget (\$M)

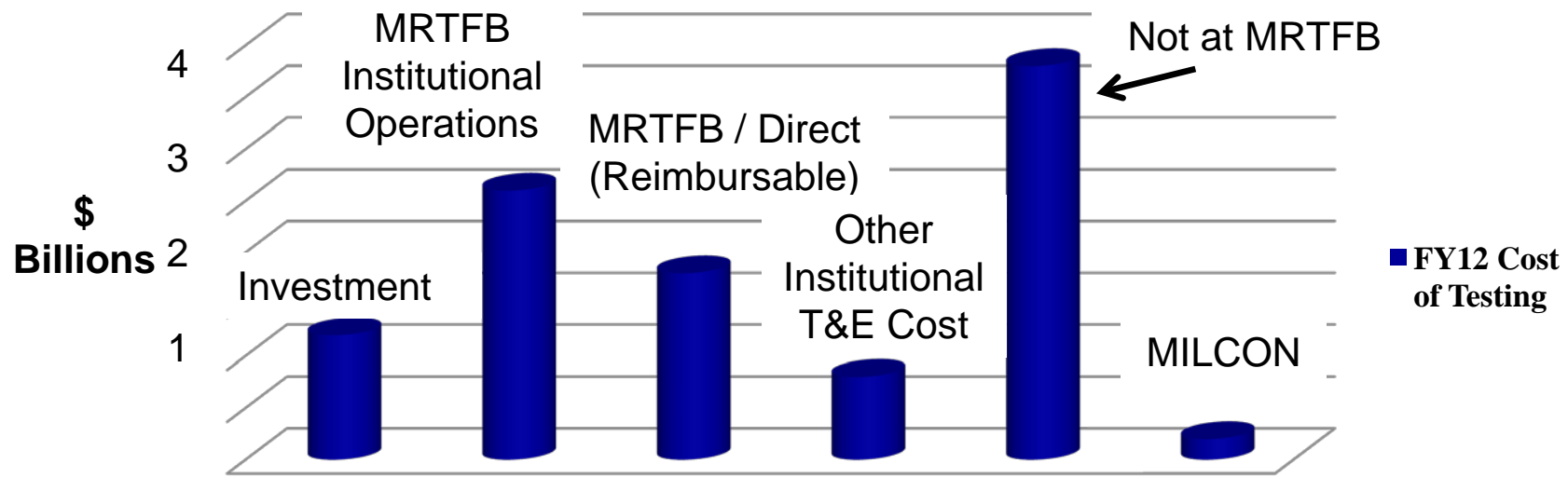
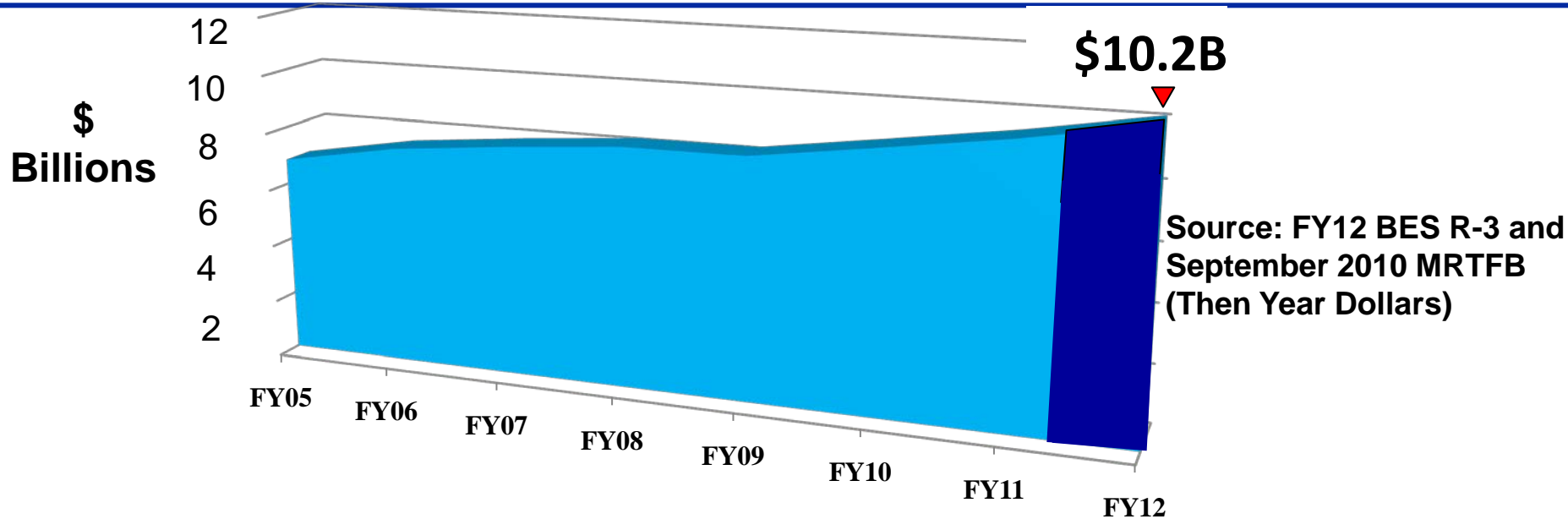
180  
160  
140  
120  
100  
80  
60  
40  
20  
0

FY00 FY01 FY02 FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16

***Total Reductions FY12-16: \$66.9M***



# DoD Cost of Testing





# DASD(DT&E) Mission *Helping Programs Succeed*



**Improve acquisition outcomes by  
early & continuous engagement**

DT&E supports:

- *Program Offices & DoD T&E community*
- *Test planning and data analysis*
- *Early discovery of deficiencies*
- *Identification / sharing of best practices*



Improve DT&E practice through:

- *T&E Policy & Guidance*
- *Advancing DT&E Capability and Service Competencies*

***Minimizing Discovery in IOT&E***

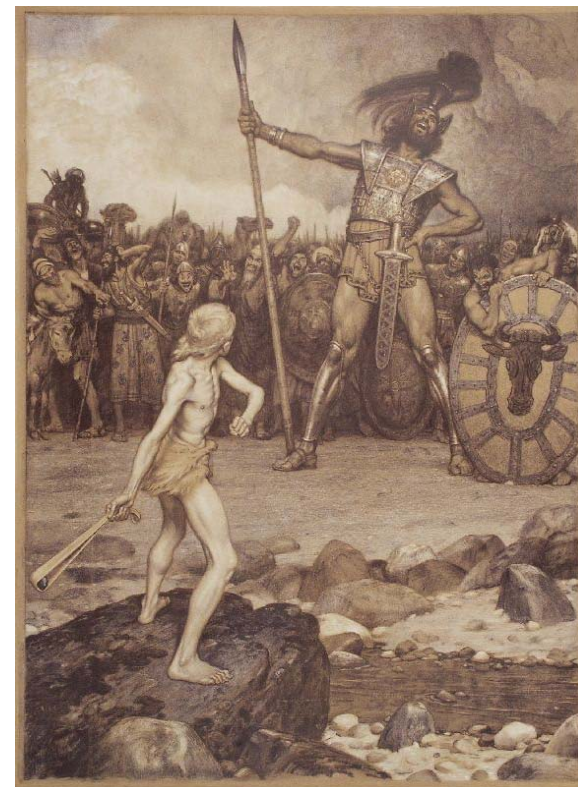




# OSD(DT&E) since WSARA



- DT&E minimized in OSD since 1995
- Acquisition accomplishments:
  - Few but Significant
  - New Emphasis at OSD level
  - Strong, Data-based inputs
- Every victory is hard won
- Concurrent need to educate Service and OSD Leaders on the role and value of DT&E

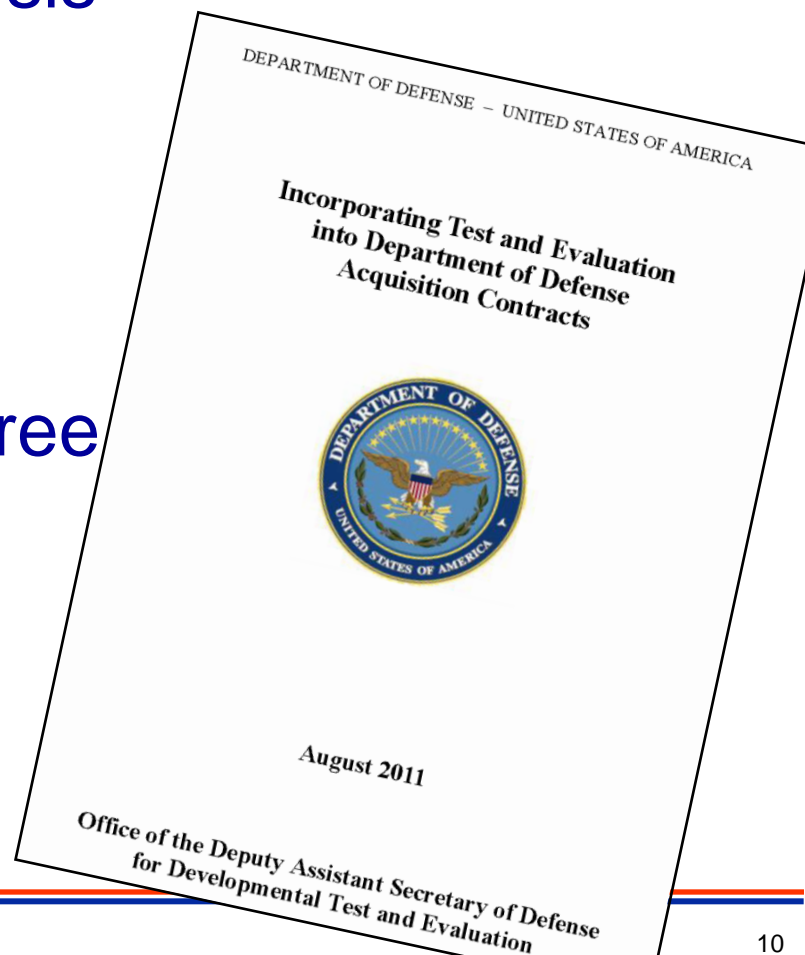




# DASD(DT&E) Initiatives



- Increased use of Modeling and Simulation
- Experimental Design and Analysis
- Incorporating T&E into DoD Acquisition Contracts
- Requirement for Technical Degree
- Certified DAU T&E Curriculum
- TEMP at Milestone A





# DT&E Observations Across the Portfolio of Programs



- **Schedule Compression**
  - Delays in development do not drive schedule adjustments
- **Concurrent development and Production**
  - High risk to concurrently develop and produce
- **Limited Test resources**
  - T&E budgets are continually challenged
- **Race to Milestone B**
  - Usually without approved TEMP
- **Race to get under contract**
  - Without adequate T&E planning
- **Requirements not always mature**



# DT&E Risk Assessments for MDAPs

## Post MS C LRIP DAB



Gray Eagle - MQ-1C Extended Range/Multi-Purpose (ER/MP) Unmanned Aircraft System (UAS)



### DAB T&E Issues:

- Program Not meeting Sustainment KPP / Reliability KSA

MTBSA (hrs)	CPD	DT Point Est	LUT Point Est
Aircraft	100	56	20
OSGCS	150*	27	20

- Compressed schedule – Little time to implement corrective actions

### How DT&E Helped – We recommended:

- Program conduct IOT&E only when system demonstrates readiness during DT and satisfies IOT&E entrance criteria
- Continue with LRIP II
- Convene OIPT, evaluate reliability

### DT&E Impacts – ADM Directed Included:

- Program provide reliability growth curves in 60 days, report progress against the reliability curve
- Conduct IOT&E on an event-based schedule notify OSD if delayed

**DT&E Impact – POSITIVE**  
**Prior to OTRR, Army rescheduled IOT&E to July 2012**



# AIM-9X Block II



## **DAB T&E Issues**

- Justify a low risk Milestone “C” by focussing on key operational capability.
- Overall T&E approach and risks to IOT&E were acceptable, but some key functions not yet demonstrated.

***How to manage risk, yet not hold up the Milestone***

## **How DT&E Helped**

- Range shots were unpredictable, yet tests were important.
- Developed options on how test objective could be met.
- **Key Option: Limit contractor full payment until a successful test event is completed.**

## **DT&E Impact**

- Milestone remained on schedule, yet discipline to meet a key test was maintained.
- Program remains on track to completing DT program before entering IOT&E in FY12



# DT&E Risk Assessments for MDAPs Assessing Programs at OTRR



(OTRR = Operational Test Readiness Review, decision point to enter IOT&E)

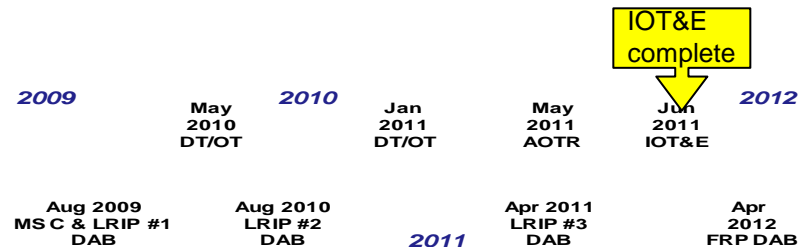
## Standard Missile 6 (SM-6)



- SM-6 combines legacy SM-2 propulsion and ordnance with AMRAAM active seeker

## Acquisition Timeline

- Assumption of low risk = very aggressive sked
- Test Schedule reflected low risk assumption
- Early discovery of problems did not delay sked



## AOTR Results

- Not enough DT - Discovery rate high & rising
- IOT&E looked more like DT (scenarios)

**“I do not recommend proceeding to IOT&E. I assess SM-6 at high risk to favorably completing IOT&E”**

***DT&E Impact – No Impact  
Navy chose to proceed to IOT&E  
DT&E recommendation ignored  
Test result: TBD***

**SM-6 DT/OT Flight Test Assessment**

**STANDARD MISSILE**

**D = Discovery in Test**

	Preburn Operation	Pitchover Guidance Performance	Midcourse Guidance Performance	Missile Radar Performance	Terminal Guidance Performance	100% Performance	Remarks
<b>CTV-1</b>							
<b>CTV-1A</b>							
OTV-1	✓	✓	✓	✓	✓	✓	Mission Success Direct Hit
OTV-2	✓	✓	✓	✓	✓	✓	Mission Success Direct Hit
AAD	✓	✓	✓	✓	✓	✓	Mission Success Live Goal Hit
OTV-3	✓	✓	✓	✓	✓	✓	Mission Success Intercept within Region R
DT-5OT-3	✓	✓	✓	✓	✓	✓	Mission Success Direct Hit
ALT-1	✓	✓	✓	✓	✗	✗	Mission Failure - Design Issue WBS Anomaly
DT-3	✓	✓	✓	✓	✓	✗	Mission Success Direct Hit
DT-1OT-1	✓	✓	✓	✓	✓	✗	TDD Anomaly due to flight test configuration
DT-1AOT-1A	✓	✓	✓	✓	✓	✗	Mission Success Intercept within Region R
DT-2	✓	✓	✓	✓	✓	✓	Mission Success Intercept within Region R
DT-4OT-2	✗	✗	✗	✗	✗	✗	Mission Failure Initiation out

**UNCLASSIFIED** Reference: SM-6 OIP Briefing 2011

- CTV-1: DUD missile Failure; (Power supply failure)
  - CTV-1A: Control Surface Anomaly; (stopped following commands)
  - GTV-3: TDD Anomaly (2 early detections)
  - ALT-1: Missile Failure: (Wide Band Search (WBS) anomaly prevented proper acquisition of target)
  - DT-3: TDD Anomaly: (Race Condition with Adjunct Telemeter)
  - DT-1/OT-1: TDD Failure: (Race Condition with Adjunct Telemeter)
  - DT-1A/OT-1A: GIF Fuze Anomaly:
  - DT-4/OT-2: DUD missile Failure: (Inertial Measurement Unit (IMU) Failed)
- Note: All Discovery Issues have been addressed by the PM with the exception of the DT-4/OT-2 IMU failure.

**Significant Discovery Continues – Increasing Trend**



# Historical AOTR - IOT&E results

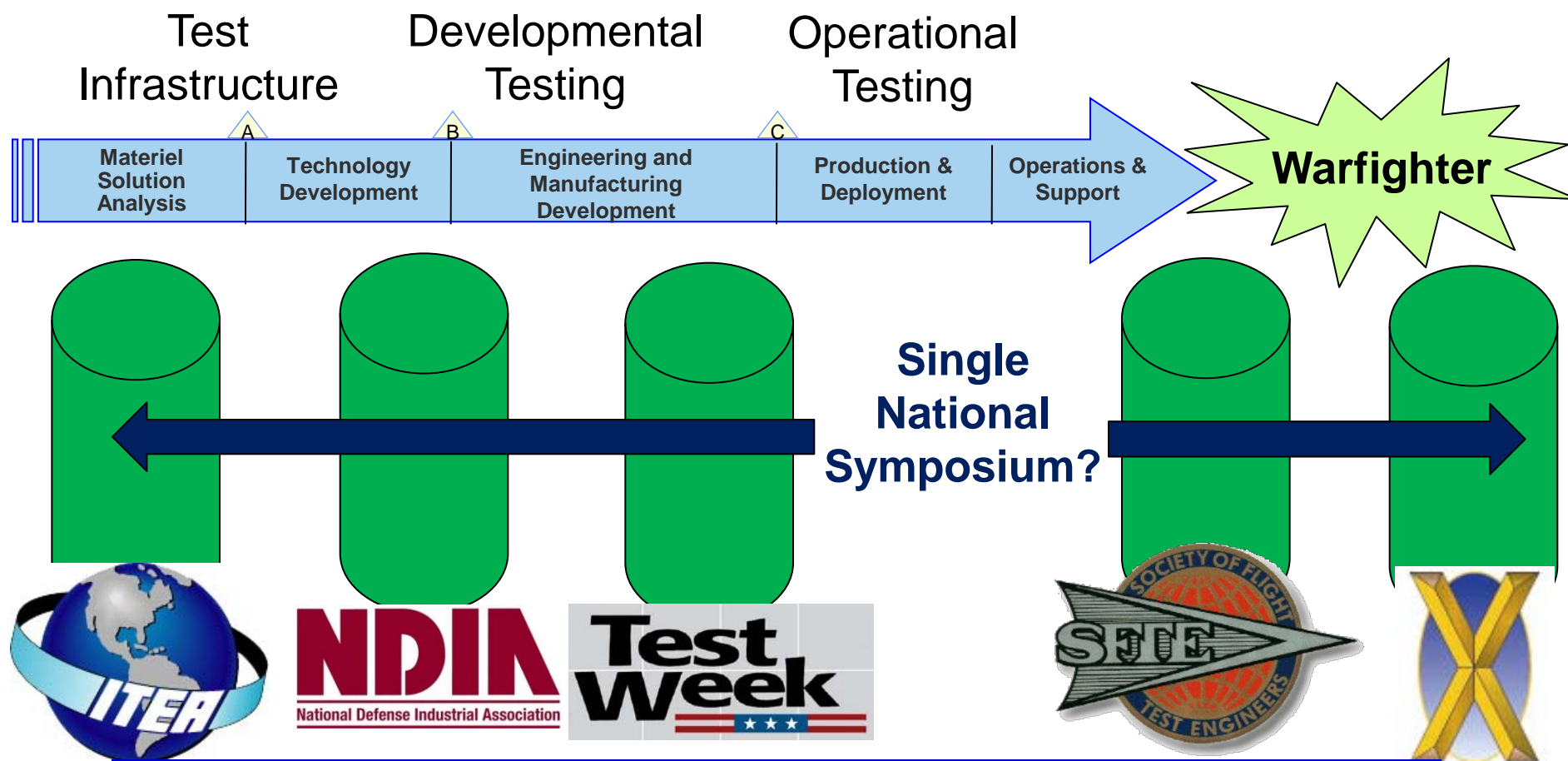
## Helping programs achieve better results



Program	Service /ACAT	AOTR Recommended:	IOT&E Results	
EA-18G	Navy 1D	Moderate risk weigh-in	Effective	Not Suitable
RMS	Navy 1D	Significant risks - OA before IOT&E	Effective	Not Suitable
H-1 Upgrade (AH-1Z )	USMC 1D	No AOTR in 2008	Test Terminated	
		Risk to IOT&E	Effective	Suitable
DASD (DT&E) Appointed 15 March 2010				
C-5 RERP	USAF 1D	Do not proceed IOT&E	Effective	Not Suitable
MIDS JTRS	Navy 1D	Proceed to IOT&E	Not Effective	Not Suitable
Global Hawk Blk 20/30	USAF 1D	Do not proceed IOT&E	Not Effective	Not Suitable
Stryker NBCRV	Army 1D	Proceed to IOT&E Ph II	Test Complete Awaiting Report	
JASSM-ER	USAF 1D	Proceed to IOT&E	TBD	
SM-6	USN 1D	Do not proceed IOT&E	Test Complete Awaiting Report	



# T&E Associations across the Enterprise



**We must be more efficient with our DoD budgets  
Need to Maximize Synergies Across Associations**





# Questions?



OFFICE OF THE SECRETARY OF DEFENSE

OFFICE OF THE UNDER SECRETARY OF  
DEFENSE FOR ACQUISITION,  
TECHNOLOGY AND LOGISTICS

DEVELOPMENTAL TEST & EVALUATION  
TEST RESOURCE MANAGEMENT CENTER

3090 Defense Pentagon  
Room 5a1076  
Washington, DC 20301-3090

**Email:** [dasd-dte@osd.mil](mailto:dasd-dte@osd.mil)

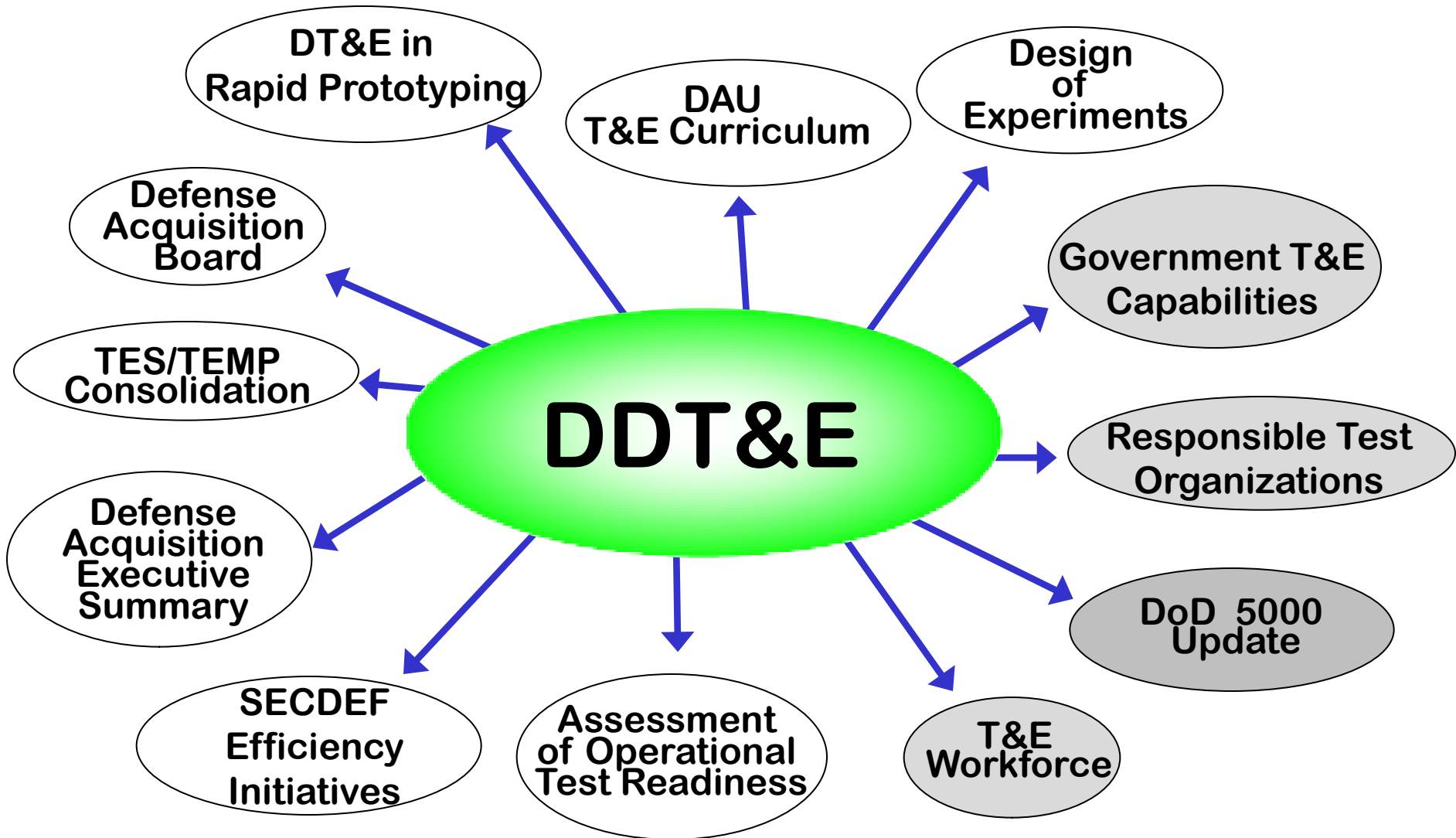
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**The right information, to the right decision maker, at the right time, for  
*better* decisions**



# Environmental Scan



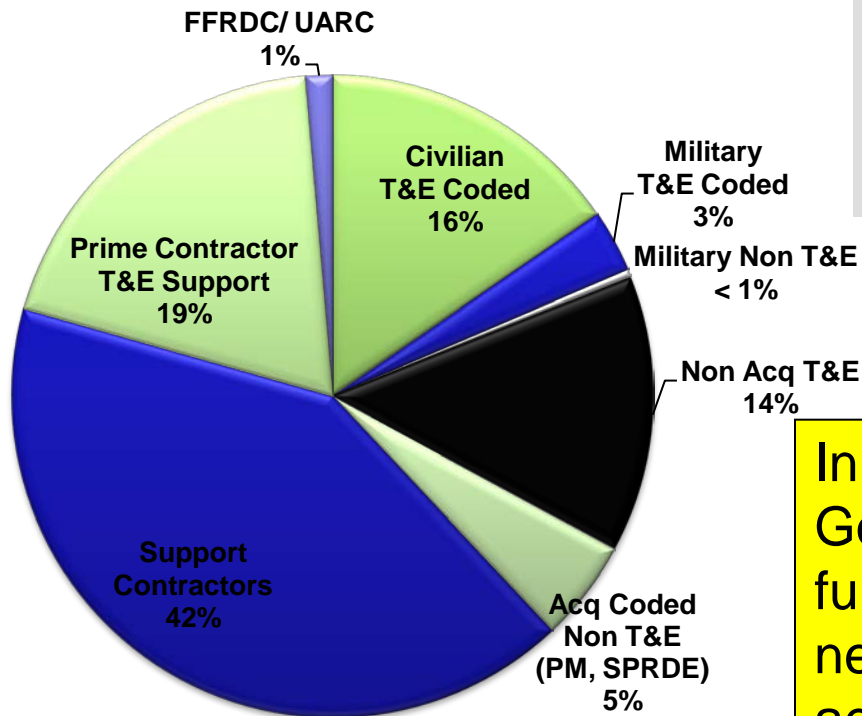


# T&E Workforce

## Data from Services' 2010 Self Assessment

Heavy reliance (61%) on Prime Contractors / Developers and Support Contractors to support T&E mission

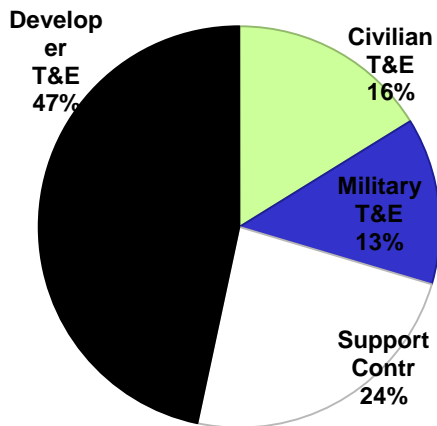
Low number of organic T&E resources 19% (Civ + Mil)



Inherently Government T&E functions may not necessarily be accomplished by Government Personnel

Non T&E Coded personnel supporting the T&E mission (PM, SPRDE, MRTFB)

Air Force T&E



Does not represent all T&E resources