



Developmental Test & Evaluation

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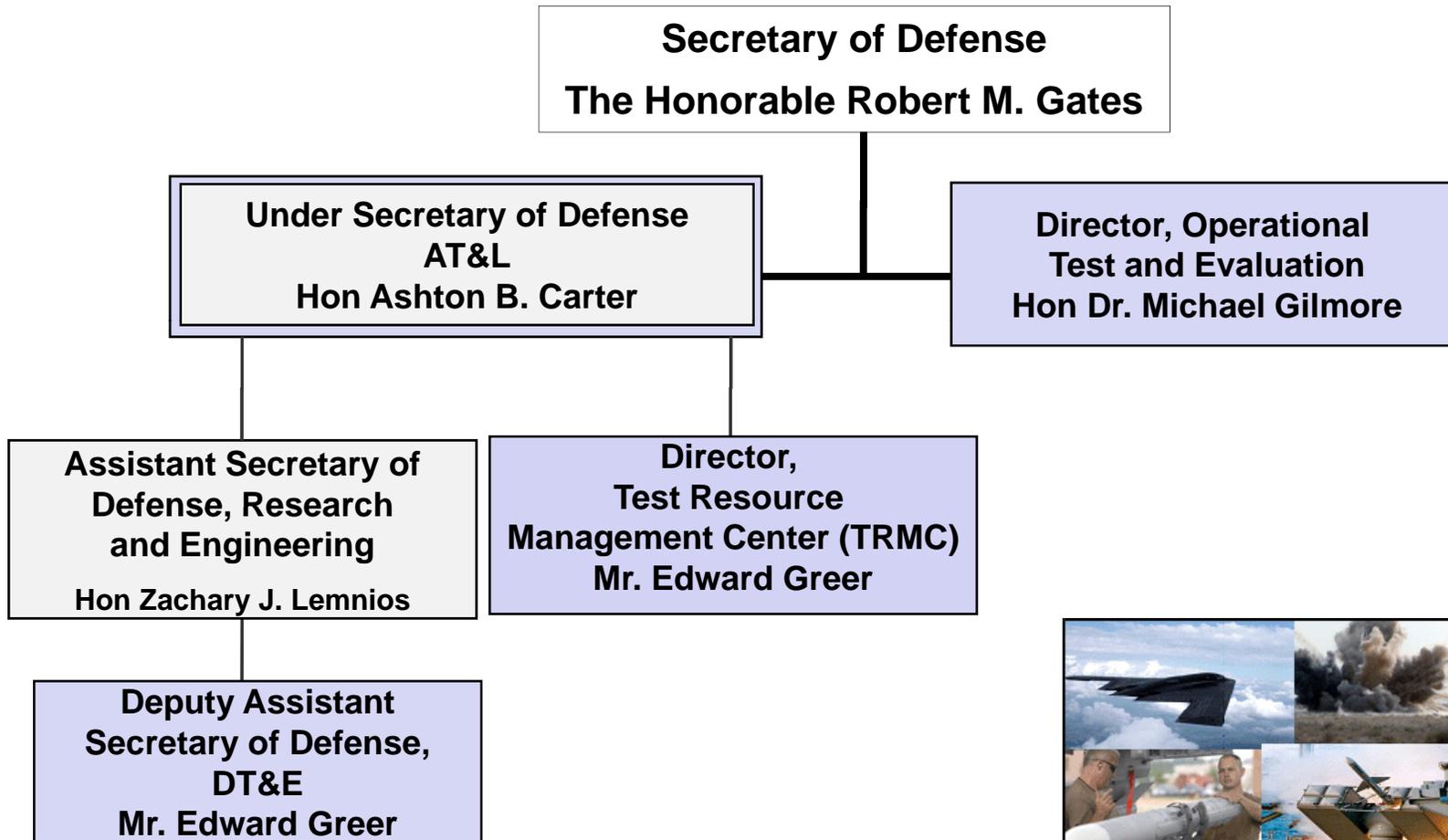
Agenda



- **New DT&E organization- who, what, where**
- **T&E Megatrends**
 - WSARA and Title 10
 - SecDef Efficiencies
 - Initiatives
- **Implications for the Community**



Test and Evaluation in OSD

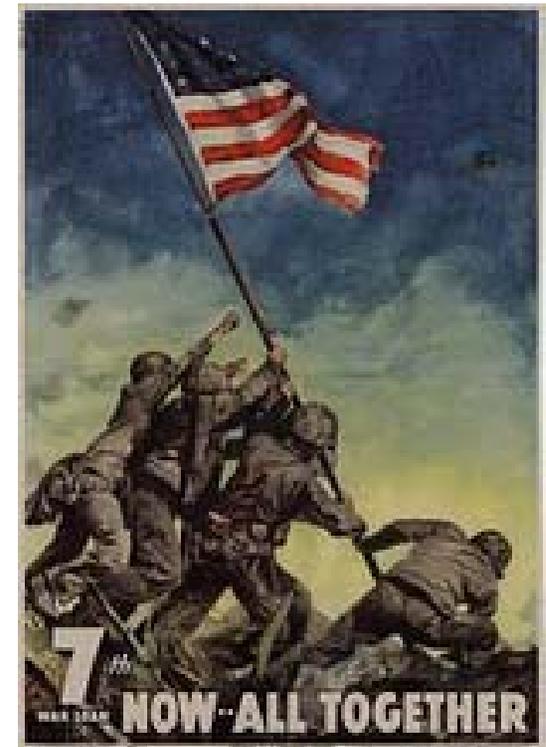




Megatrends/Imperatives



- **Better Acq: WSARA and the new DT&E Office**
 - Acquisition Reform is still front burner issue
 - Usual suspects
- **Budget Reality: SecDef Efficiency Initiatives**
 - Overview
 - Implications for T&E
 - DOE, Reliability, M&S, IT.....
- **Imperatives**
 - Current
 - Future
 - Cyber

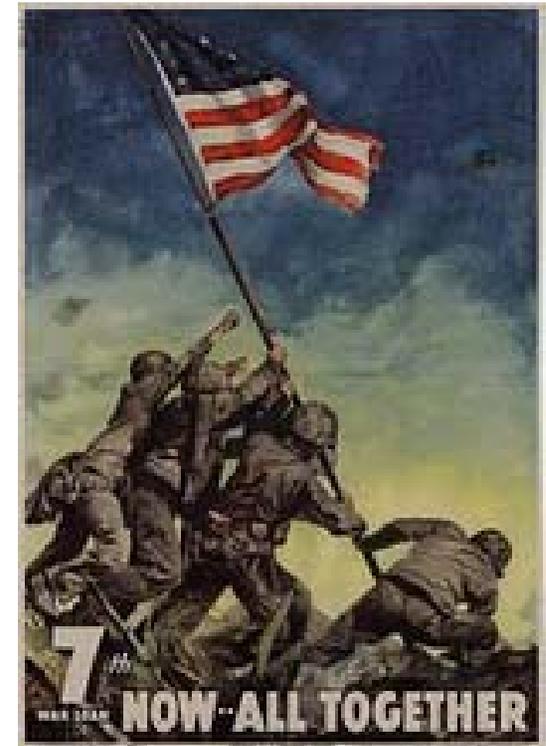




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What's Wrong with Acquisition?



THE USUAL (?) SUSPECTS

Cost

Over Budget

- GAO: 96 MDAPs, \$300B over initial estimates

Schedule

Late to Need

- Getting capability to the user to meet urgent needs

Performance

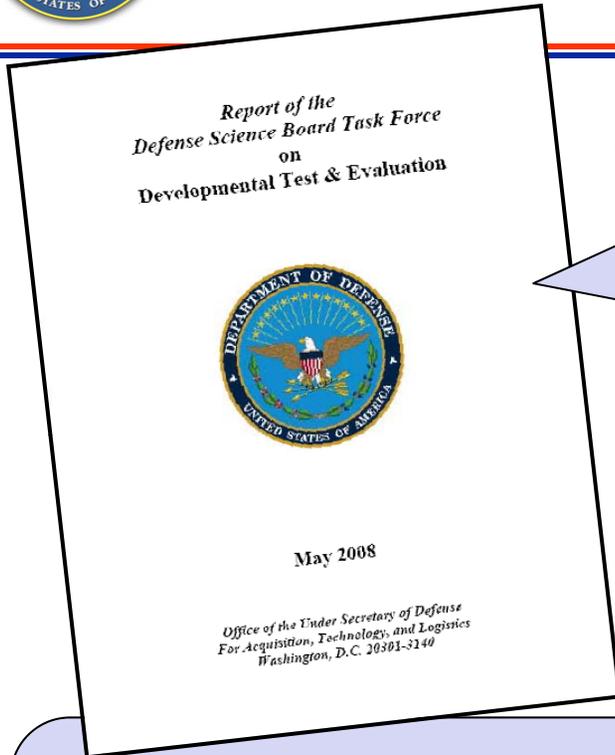
Programs failing Operational Test

- Suitability issues
- Late discovery of failure modes
- Performance shortfalls
- Interoperability





Sez Who?



“Approximately 50% of programs completing IOT&E since 2000 have been assessed as *not operationally effective and/or suitable.*”
2008 DSB Report

“. . .beginning production before *successfully demonstrating that the weapon system will work* as intended increases the potential for discovering costly design changes...and usually requires substantial modification costs at a later time.”
2008 GAO Assessments of Selected Weapon Programs





Bottom Line



DoD Systems take too long to field, cost too much and don't perform as required



..... enter the Weapons System Acquisition Reform Act



Purpose - Eliminate waste and inefficiency in defense projects

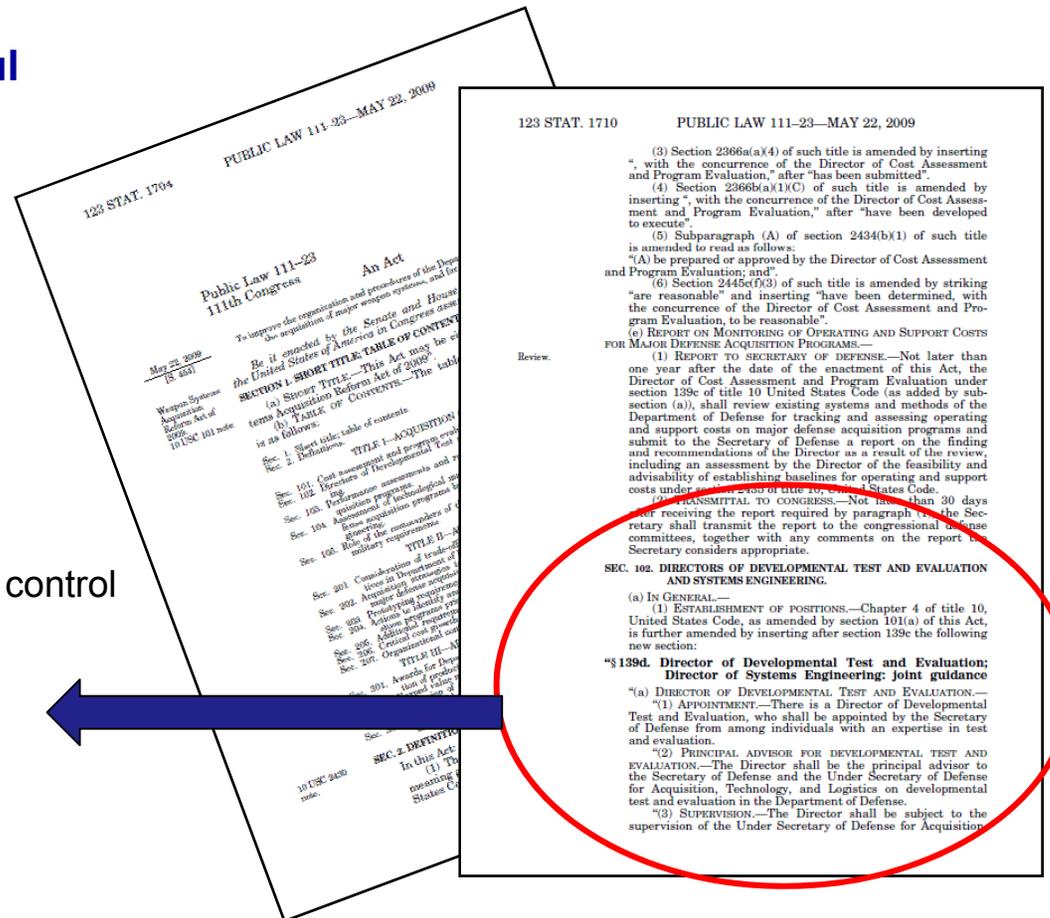
Why - President noted that the wasteful spending stems from:

- Out of the ordinary requirements
- No-bid contracts
- Lack of oversight

Concern - Schedule delays and cost overruns

How - Strengthen oversight and accountability

- Appoint officials to closely monitor and control costs
- New offices of SE and **DT&E**
 - Greater focus on testing new weapons
 - Ensure technologies are mature
 - Ensure programs are started right
- Improve competition
- End conflicts of interest





WSARA and DT&E



The DDT&E is the principal advisor to the Secretary of Defense and the Under Secretary of Defense for Acquisition, Technology and Logistics on developmental test and evaluation in the DoD

Responsibilities:

- Program Oversight
- Policy and Guidance
- T&E Strategy (TES) / TEMP
- Acq DT&E workforce
- Component T&E Capability
- Annual Report to Congress



DT&E in Title 10, USC, Section 139d
WSARA signed May 22, 2009



D,DT&E Mission



Improve acquisition outcomes by

Supporting:

- Acquisition programs (**planning, advocacy**)
- DT&E workforce and community (advocacy)
 - Capability and competencies
 - Advancing “state-of-the-practice”
 - Policy development
- Decision Makers
 - **Performance assessment**
- Warfighters



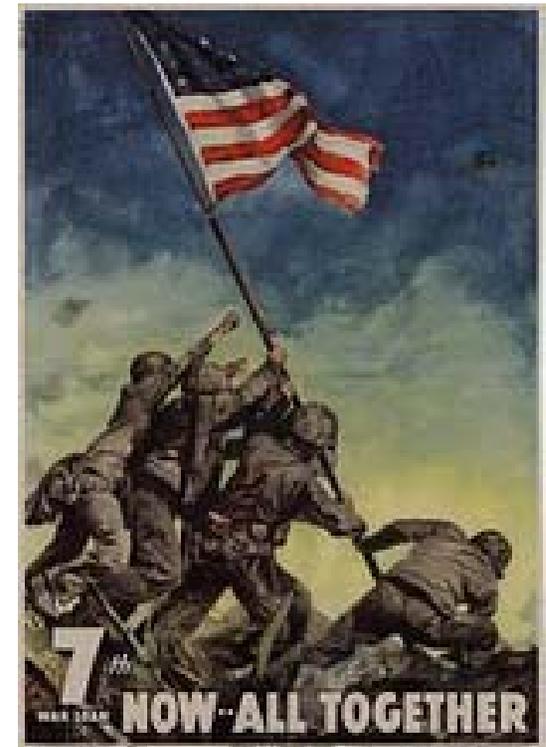
..... and minimize Discovery in IOT&E



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DoD Budget Realities



- Although the U.S. faces significant economic challenges and growing budget deficits, Defense base funding must have **real growth to sustain force structure** and needed modernization
 - Fighting Two Wars
 - Confronting ongoing terrorist threats around the globe
 - Facing major powers investing heavily in their military
- Sustaining current force structure and needed modernization requires 2-3% real growth
- The current and planned base defense budget has steady, but modest growth of 1% per year
- To make up the difference and **preclude reductions in needed military capability**, the difference of 1-2% a year will be made up elsewhere in DoD
- In May, SecDef began a hard, **unsparing look at how DoD is staffed, organized, and operated**

“...in May I called on the Pentagon to take a hard and unsparing look at how the department is staffed, organized and operated. I concluded that our headquarters and support bureaucracies, military and civilian alike, have swelled to cumbersome and top-heavy proportions, grown over-reliant on contractors and grown accustomed to operating with little consideration to cost.”Secretary of Defense Robert M. Gates



..... enter the SecDef Plan for Efficiency



- Target Affordability and Cost Growth
- Incentivize Productivity & Innovation in Industry
- Promote Real Competition
- Improve Tradecraft in Services Acquisition
- Reduce Non-Productive Processes and Bureaucracy



(L) Secretary of Defense Robert M. Gates
(R) USD AT&L Dr Ashton B. Carter

“Consumers are accustomed to getting more for their money – a more powerful computer, wider functionality in mobile phones – every year. When it comes to the defense sector, however, the taxpayers had to spend significantly more in order to get more. We need to reverse this trend.”Secretary of Defense Robert M. Gates



Why Test?



- Iterate/Mature the Design
- Failure Mode Discovery

Material Developer

- Inform Acquisition Decisions

Decision Authority

- Confirm Performance
- Safety
- Capabilities and Limitations

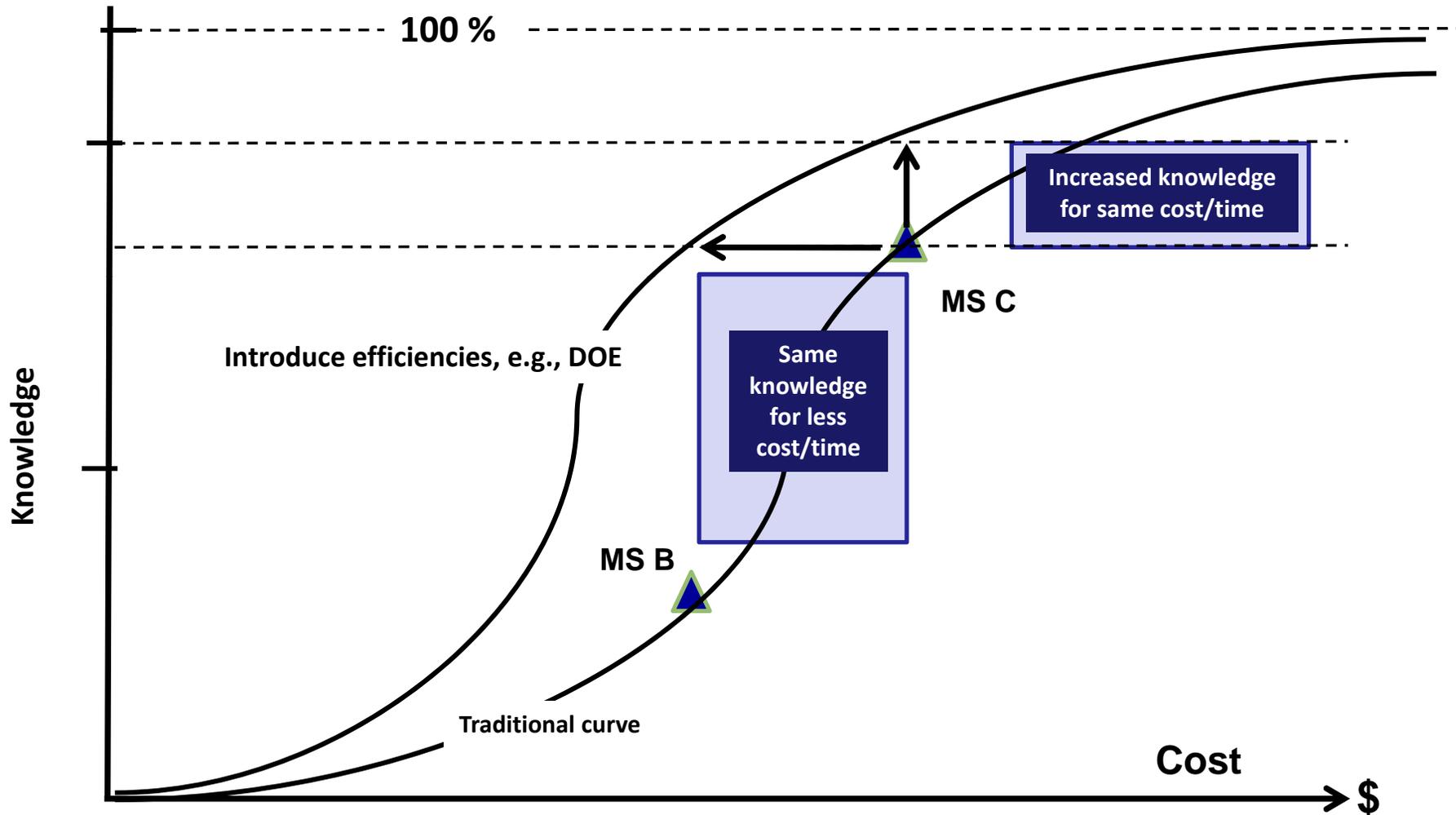
Warfighter



***“Testing is the Conscience of Acquisition”
William J. Perry - former SecDef***



Knowledge vs Cost



T&E Challenge: most knowledge for the least resources.



Challenges to doing good?



1. “Testers like to test”

- Who requires, who pays?

2. “A dollar spent on test is a dollar spent on bad news”

- Incentives matter

3. “Testing is driving up our costs”

- Now vs. later?

4. “We can’t afford it ”

- See #3



..... and how can T&E help?



- **Enterprise Perspective**

- Acquisition Savings
 - Mature Systems
 - Reliability
 - Early discovery
- Adequate testing (early)

- **T&E Cost**

- Too much
- Bad news
- Late T&E Requirements

- **Test Community Perspective**

- Recognize our role
- Manage our appetite
- Support the risk-based level of information needed
- Do our job more efficiently

- **T&E Savings**

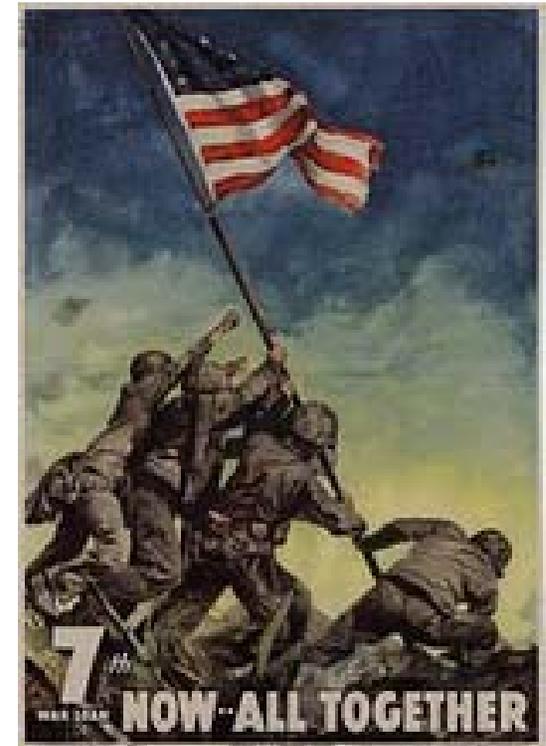
- STED (e.g., DOE)
- Distributed
- CRIS
- Capital Utilization
- Integrated Test



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DT&E Challenges/Imperatives



- **Support Acquisition (WSARA)**
 - Robust, efficient, risk-based T&E
 - Early engagement (Rqmts, AoA, RFP, SS....)
 - Performance Assessment (inform the decision makers)
- **Support SecDef Initiatives (Efficient T&E (doing more with less))**
 - Integrated Test
 - DOE
 - Capital Utilization
 - M&S, ground testing
 - Distributed testing
- **Reliability**
- **IA and IO**
- **Cyber**
- **Rapid Fielding**
- **Workforce skill mix**





Cyber Warfare



Computer Network Operations

- Months, days, hours...uSecs
- Attribution
- Role? DoD, Federal, Civil

Attack (CNA)

- Precision strike
- Kinetic effects

Defense (CND)

- Cyber missiles
- Mission critical tasks, functions

Exploitation (CNE)

- Intelligence



“The best-laid defenses on military networks will matter little unless our civilian critical infrastructure is also able to withstand attacks.”Deputy Secretary Bill Lynn



Cyber Warfare



What's the role for T&E?

Scope: Focus on CND and MDAPs?

- Define cyber defense issues in network environments
- What systems are most vulnerable?
 - Weapon systems?
 - IT systems?
- Rigorous cyber defense testing
- Develop a cyber defense T&E framework
- Institutionalize cyber defense IT



With hundreds of legacy and new programs in development each entering our networks, we cannot afford the chaos of each one individually planning or just not testing for cyber defense.



OD,DT&E How-Goz-It?



- Establish ODDT&E/DDR&E
- Organizational Relationships
- Staffing
- Director
- POM 11
- 1st Annual Report





Implications for the Test and Acquisition Communities



- **Enterprise will manage risk**

- Oversight and Accountability
- Rapid vs. Deliberate Acquisition

- **Visibility**

- More emphasis on DT
- DT&E voice at DAB
- Increased planning rigor/fidelity
 - D,DT&E TEMP approval
- Efficiencies: DOE, IT, M&S.....

- **Acquisition**

- Accept less risk at MS decisions
- More DT less OT?
 - Confirmation vs Discovery
- More informed decisions





DDT&E is



✓ **Back!**

✓ **T&E Community Advocate!**

✓ **Improving Acquisition Outcomes**



Questions?



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



Back-Up



SecDef Efficiency Objectives



- Deliver the warfighting capability we need for the dollars we have
- Get better buying power for warfighter and taxpayer
- Restore affordability to defense goods and services
- Improve defense industry productivity
- Remove government impediments to leanness
- Avoid program turbulence
- Maintain a vibrant and financially healthy defense industry

Obtain 2-3% net annual growth in warfighting capabilities without commensurate budget increase by identifying and eliminating unproductive or low-value-added overhead and transfer savings to warfighting capabilities. Do more without more.



T&E Challenges



- **Rapid Fielding**
 - Safety
 - Caps and Lims
- **Emerging Technologies**
How/where to test?
 - Hypersonics
 - Autonomous systems
 - Weaponized unmanned systems
 - Net-enabled weapons
- **Range Encroachment**
 - OCS exploration/drilling ?
 - Spectrum?
 - Wind generators... !!!!!





T&E Challenges (continued)

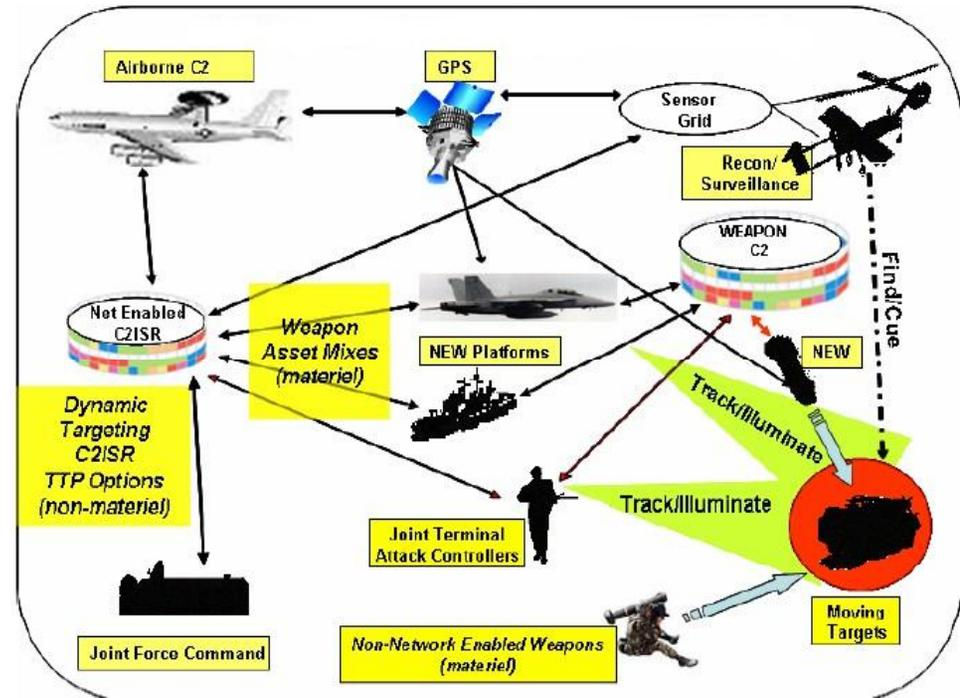


- **Complex Systems**

- System of Systems
- Interdependent systems?
- Data fusion
- S/W intensive systems

- **Balancing Adequacy vs Speed to Field, Cost.....**

- DOE?
- How much is enough? Risk management
- How much M&S? LVC?
- Other tools





T&E Challenges (continued)



- **Reliability**

- 50% of MDAPs are failing OT (Suitability)
- DOT&E imperative – RAM growth testing

- **Rigor – Realistic Environments?**

- Stressing countermeasures (GPS jamming), clutter..... Operationally relevant scenarios
- Threat representations

- **End-to-End testing**

- Mission Context
 - Mission threads
- Interoperability and IA





Encourage Efficiency



ADOPTING “SHOULD-COST” AND “WILL-COST” MANAGEMENT: Use historically informed independent cost estimation (“will-cost” estimates) to inform managing of programs to cost objectives (“should-cost” estimates).

STRENGTHENING THE ACQUISITION WORKFORCE: Achieve SECDEF goal of adding to government acquisition workforce with increased skill levels. Leverage unique qualities of non-profit FFRDCs and UARCs to augment acquisition workforce capability.

IMPROVING AUDITS: Improve consistency and quality of government audits, and focus them on value-added content.

MANDATING AFFORDABILITY AS A REQUIREMENT: In new programs such as the SSBN-X nuclear missile submarine, the Presidential Helicopter, the Ground Combat Vehicle, and the Air Force/Navy Long Range Strike Family of Systems, cost considerations must shape requirements and design.

STABILIZING PRODUCTION RATES: To ensure more programs are in stable, economically favorable rates of production and avoid cost escalation, program managers may not adjust production rates downward without head of component authority.

ELIMINATING REDUNDANCY WITHIN WARFIGHTING PORTFOLIOS: Emulate the Army’s Precision Fires Capability Portfolio approach to identify where multiple programs are pursuing similar objectives.

ESTABLISHING SENIOR MANAGERS FOR PROCUREMENT OF SERVICES: Follow the Air Force lead in establishing a Program Executive Officer for services in each DOD component to focus on improving policy and practice in this high-dollar-value area.

PROTECTING THE TECHNOLOGY BASE: Protect the future by sustaining investment while focusing on high value-added work.



DoD HQ Testing*



Policy, guidance, and oversight to ensure OT&E is adequate to confirm operational effectiveness and suitability in combat use

Director, Operational Test & Evaluation (Dr. Gilmore)

Planning and assessment of the adequacy of the Major Range and Test Facility Base to provide testing in support of defense acquisition

Test Resource Management Center (Dr. Foulkes)

Policy, guidance, and oversight to ensure DT&E is adequate to support program development and assess system performance for decision authority

Director, Developmental Test & Evaluation (Mr. Greer)

Secretary of Defense

USD, Acquisition, Technology & Logistics

Director, Defense Research & Engineering

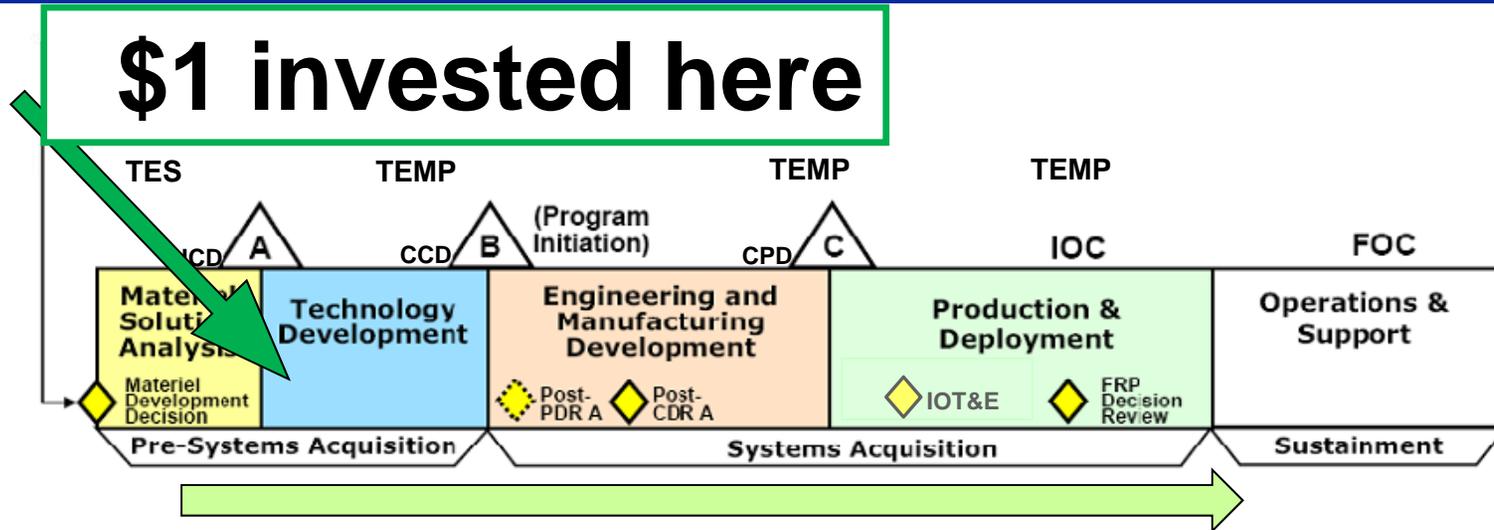
DT&E is approximately 80% of the overall program T&E effort

*Chart does not reflect entire OSD Organization



DDT&E in DoD: Engage Early

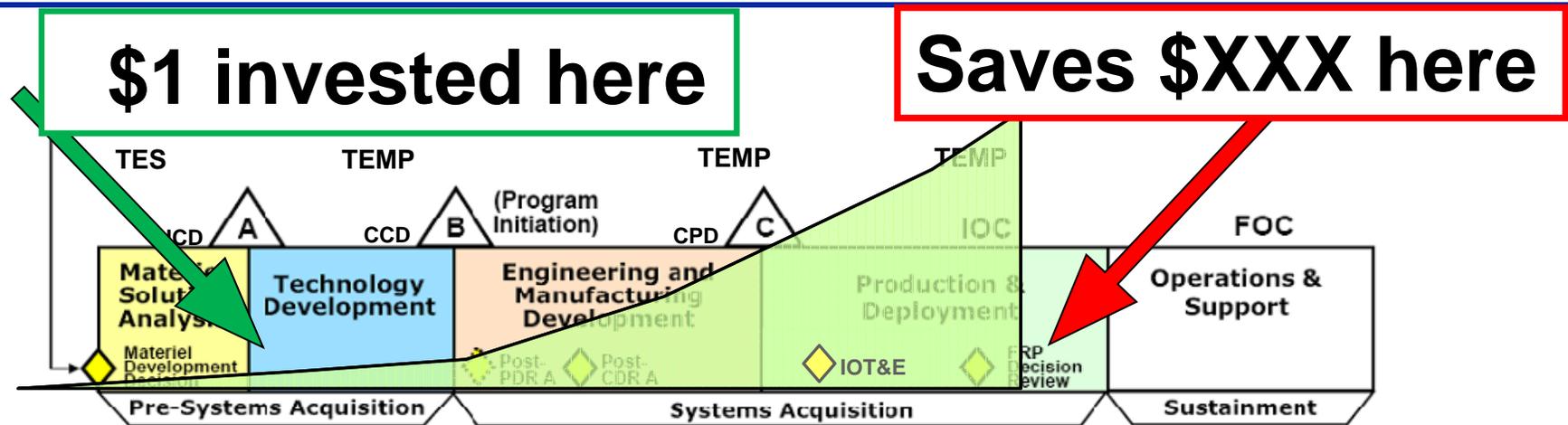
\$1 invested here



<ul style="list-style-type: none"> ▪ Test Evaluation Strategy (TES) ▪ Technology Development Strategy (TDS) ▪ Identify emerging T&E capability requirements ▪ Identify T&E resources ▪ Develop T&E requirements in RFP ▪ Support AoA technical analysis 	<ul style="list-style-type: none"> ▪ Test and Evaluation Master Plan (TEMP) ▪ Acquisition Strategy ▪ Support T&E Program Execution ▪ Provide T&E results for OIPT/DAB Reviews ▪ CDD requirements for testability and ability to evaluate ▪ Support TRL Evaluation ▪ T&E requirements in RFP ▪ Report of performance measures, metrics and evaluations 	<ul style="list-style-type: none"> ▪ Update TEMP ▪ Support T&E Program Execution ▪ Provide T&E results for OIPT/DAB Reviews ▪ Support PDR/CDR and all technical reviews ▪ CPD requirements for testability and ability to evaluate ▪ Support TRL Evaluation ▪ T&E requirements in RFP ▪ Discovery and deficiencies ▪ Report of performance measures, metrics and evaluations 	<ul style="list-style-type: none"> ▪ Update TEMP ▪ Support T&E Program Execution ▪ Characterize system capabilities and limitations ▪ Provide T&E results for OIPT/DAB Reviews ▪ AOTR / OTRR ▪ Support training for IOT&E ▪ Report of performance measures, metrics and evaluations 	<ul style="list-style-type: none"> ▪ Update TEMP for Follow-on DT&E and OT&E ▪ Verification of corrections for deficiencies ▪ Develop T&E programs to support upgrades, modifications, and increments ▪ Support T&E Program Execution ▪ Report of performance measures, metrics and evaluations
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DDT&E in DoD: What and When



A few DDT&E observations:

- Lack of DT&E expertise during program formulation
- DT&E program planning and resourcing not adequate
- System immaturity at MS C or at OTRR
- Inadequate reliability growth programs



Where are We Going?

As Is	To Be
Serial Testing	Integrated Test/Training
Platform-Based	System of Systems
Threat-Based	Complex Capabilities
Contract Compliance	Mission Context
Interoperability	Joint Mission Thread
Deliberate	Rapid/Responsiveness

Our T&E process needs to evolve to support faster product cycles, more adaptable products and address challenges



Guidance Roadmap



Target Affordability and Control Cost Growth

- Mandate affordability as a requirement
 - At Milestone A set affordability target as a Key Performance Parameter
 - At Milestone B establish engineering trades showing how each key design feature affects the target cost
- Drive productivity growth through Will Cost/Should Cost management
- Eliminate redundancy within warfighter portfolios
- Make production rates economical and hold them stable
- Set shorter program timelines and manage to them

Incentivize Productivity & Innovation in Industry

- Reward contractors for successful supply chain and indirect expense management
- Increase the use of FPIF contract type where appropriate using a 50/50 share line and 120 percent ceiling as a point of departure
- Adjust progress payments to incentivize performance
- Extend the Navy's Preferred Supplier Program to a DoD-wide pilot
- Reinvigorate industry's independent research and development and protect the defense technology base

Promote Real Competition

- Present a competitive strategy at each program milestone
- Remove obstacles to competition
 - Allow reasonable time to bid
 - Require non-certified cost and pricing data on single offers
 - Require open system architectures and set rules for acquisition of technical data rights
- Increase dynamic small business role in defense marketplace competition

Improve Tradecraft in Services Acquisition

- Create a senior manager for acquisition of services in each component, following the Air Force's example
- Adopt uniform taxonomy for different types of services
- Address causes of poor tradecraft in services acquisition
 - Assist users of services to define requirements and prevent creep via requirements templates
 - Assist users of services to conduct market research to support competition and pricing
 - Enhance competition by requiring more frequent re-compete of knowledge-based services
 - Limit the use of time and materials and award fee contracts for services
 - Require that services contracts exceeding \$1B contain cost efficiency objectives
- Increase small business participation in providing services

Reduce Non-Productive Processes and Bureaucracy

- Reduce the number of OSD-level reviews to those necessary to support major investment decisions or to uncover and respond to significant program execution issues
- Eliminate low-value-added statutory processes
- Reduce by half the volume and cost of internal and congressional reports
- Reduce non-value-added overhead imposed on industry
- Align DCMA and DCAA processes to ensure work is complementary
- Increase use of Forward Pricing Rate Recommendations (FPRRs) to reduce administrative costs



Providing Incentives for Greater Efficiency in Industry



- **LEVERAGING REAL COMPETITION:** Avoid directed buys and other substitutes for real competition. Use technical data packages and open systems architectures to support a continuous competitive environment.
- **USING PROPER CONTRACT TYPE FOR DEVELOPMENT AND PROCUREMENT:** Phase out award-fee contracts and favor fixed-price or cost-type incentive contracts in which government and industry share equally in overruns and underruns, and overruns have analytically-based caps. Use cost-reimbursement contracts only when either government requirements or industry processes cannot be adequately specified to support pricing. Adjust sole-source fixed-price contracts over time to reflect realized costs. Work down undefinitized contract actions. Seek authority for multi-year contracts where significant savings are possible.
- **USING PROPER CONTRACT TYPE FOR SERVICES:** Phase out Time and Material and sole-source ID/IQ contracts wherever possible. Utilize fixed-price performance-based contracts when requirements are firm and can be measured, with payments tied to performance. Utilize fixed-price level of effort or cost-plus-fixed-fee contracts (with profit/fee tied to weighted guidelines) when requirements are still being defined. Award fees should be used only by exception. Maximize the use of multiple-source, continuously competitive contracts.
- **ALIGNING POLICY ON PROFIT AND FEE TO CIRCUMSTANCE:** Align opportunity to earn profits/fees to both value to the taxpayer and risk to the contractor. Apply weighted guidelines to profit/fee levels. Reward higher productivity with higher profits. Incentivize investment in innovation.
- **SHARING THE BENEFITS OF CASH FLOW:** Ensure that taxpayers receive adequate consideration (price reductions) for improved cash flows. Progress payments must reflect performance but can be increased above customary levels in return for consideration by the contractor. Reduce over time the gap between proposed and actual rates in forward price rate agreements.
- **TARGETING NON-VALUE-ADDED COSTS:** Identify and eliminate non-value-added overhead and G&A charged to contracts. Limit fees for subcontractor management to reflect actual value provided (risk assumed by prime and continuous subcontractor risk reduction). Limit B&P allowable costs in sole source contracts and encourage effective use of IRAD.
- **INVOLVING DYNAMIC SMALL BUSINESS IN DEFENSE:** When establishing multiple award contracts for services, make every effort to provide for small business participation. If at least two small businesses are deemed capable of performing on such a contract, consider setting aside that work for competition among them.
- **REWARDING EXCELLENT SUPPLIERS:** Emulate the Navy's pilot program to provide special benefits to consistently excellent industrial performers.



Environmental Scan

