

DEFENSE BUSINESS BOARD



Best Practices for the Business of Test and Evaluation

October 20, 2016

Task Group

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Task

“...Review the Department’s T&E enterprise to assess its management and utilization of both organic and contract resources and infrastructure...to ensure excellence in managing the enterprise, reduce duplication, and achieve savings. The review should include...any other such matters as the DBB deems relevant.”

- T&E TOR, signed 21 Jan 16



Bottom Line Up Front

- “Test & Evaluation” (T&E) is a function of, and critical to, the acquisition process
 - True costs (dollars and people) are unknown
 - Infrastructure is not fully postured for the future
 - Different business and risk decisions made from the same test data pressure cost and schedule
 - Too many approvers, Services’ feel unable to influence risk calculus
 - Diffuse risk accountability results in very low tolerance for risk
- Recommendations
 - Align T&E accountabilities with Program Management
 - Strengthen Service voice in risk decisions
 - Create cost discipline and apply it as a management tool
 - Improve effectiveness of T&E infrastructure



Test and Evaluation Ecosystem

- Purpose
 - Part of the overall DoD acquisition process
 - Assess fitness against requirements and performance
 - Key acquisition process decisions are informed by test results

- Function
 - Validate design parameters throughout:
 - Technology Maturation and Risk Reduction Phase (TMRR)(Between Milestone A&B)
 - Engineering and Manufacturing Development Phase (EMD)(Between Milestone B&C)
 - Production and Development Phase (P&D)(Post Milestone C)

Test and Evaluation Ecosystem

■ Cost

- June 2015 IDA study (based on many caveats and assumptions)
 - FY14 - ~\$8.23B
 - FY16 est. - \$9.05B
- Indirect costs unknown

■ People

- Many Organizations and Contractors – total FTEs unknown
- ~26k Military / Civilian / Contractor in infrastructure

■ Places

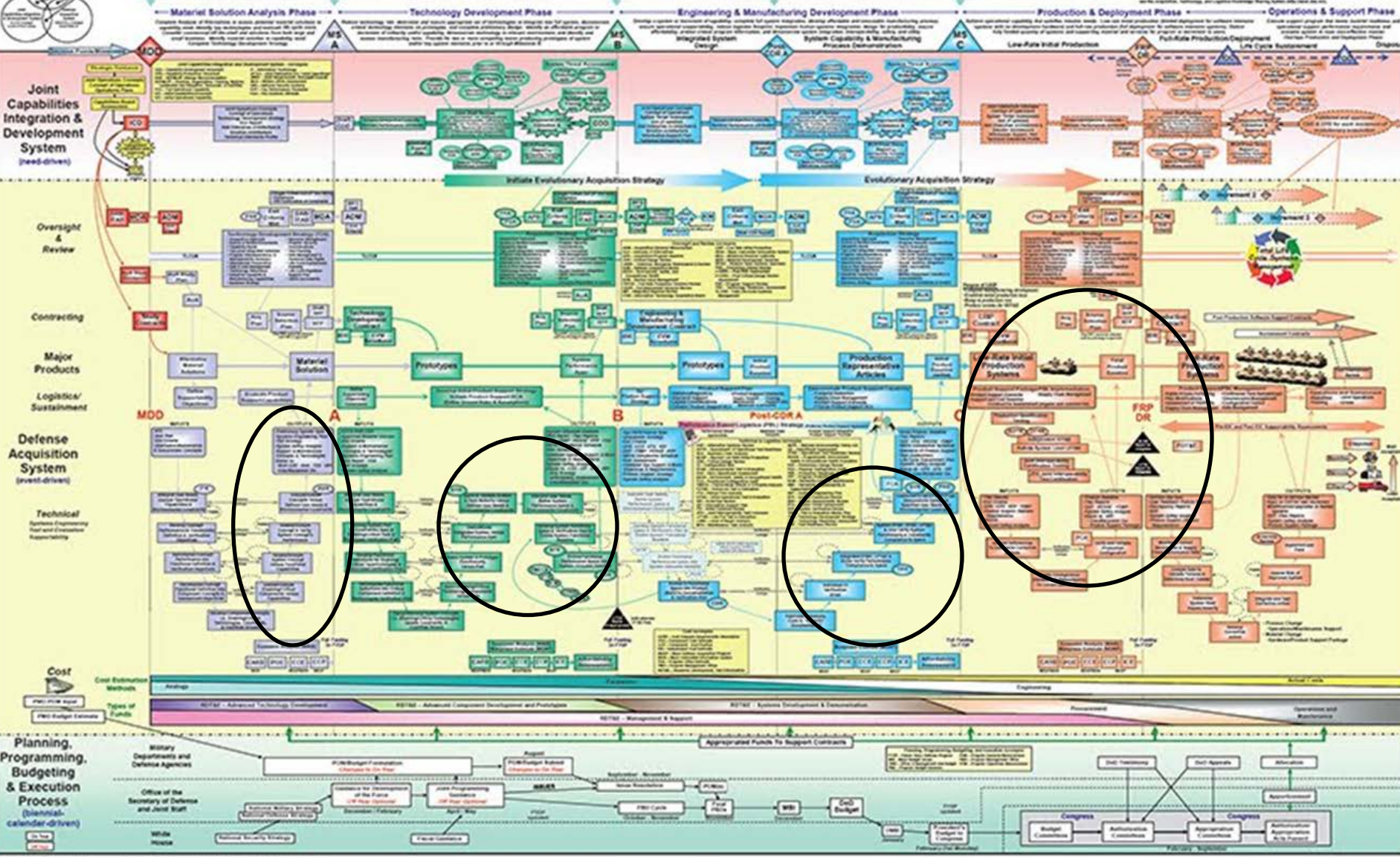
- 23 MRTFB ranges all over country
- Countless contractor facilities (primarily for DT that is conducted by a contractor as a part of an acquisition)

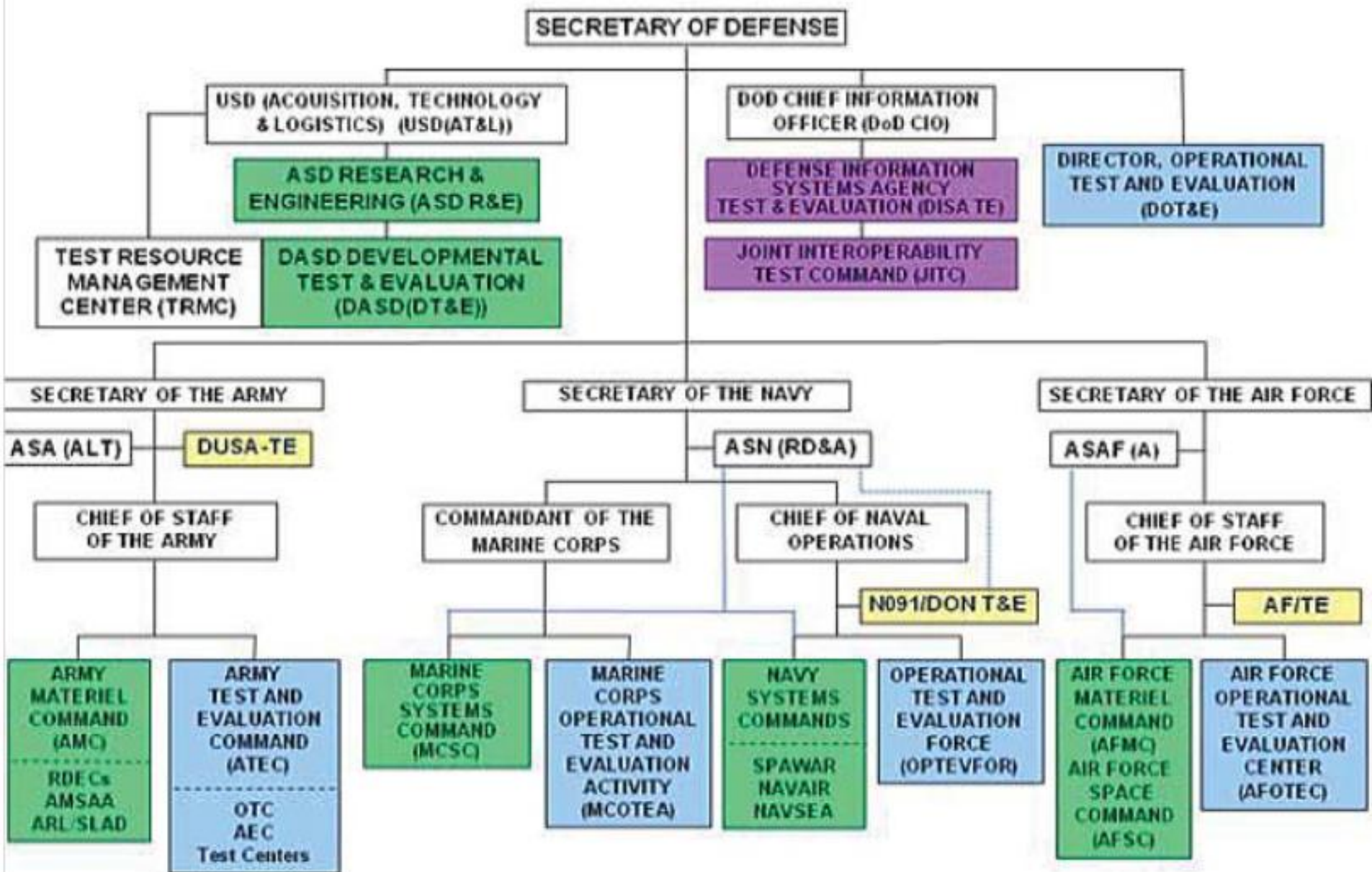
Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System



Version 1.0.0 17 June 2008

Following the Materiel Development Decision, the Milestone Decision Authority may authorize entry into the acquisition process at any point, consistent with phase-specific entrance criteria and statutory requirements



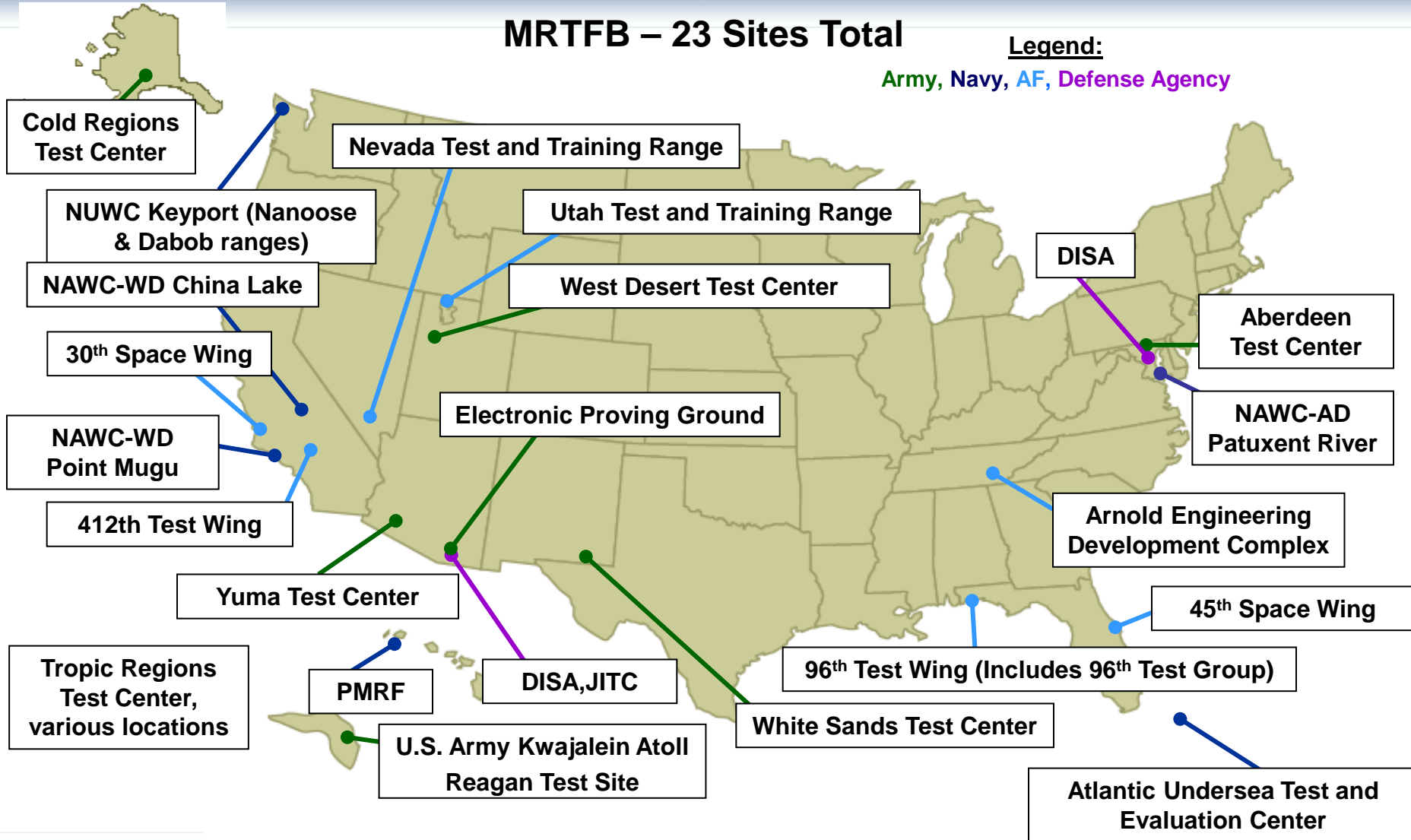


Infrastructure

MRTFB – 23 Sites Total

Legend:

Army, Navy, AF, Defense Agency



Findings: Process

- T&E is a small but essential function within the large and complex DoD acquisition process
- The overall process design integrating T&E into major programs seems reasonable and logical
 - Methodology is well understood and time tested
 - All programs include a T&E component
 - The Test and Evaluation Master Plan (TEMP) is the key T&E document for a program
- Test points and the plan to validate them (via the TEMP) are difficult to fully define early in a program
 - Fidelity is gained as the program and technology matures
 - Large programs may have up to 30 separate entities that must approve the “plan” along the way

Findings: Process (continued)

- Overall T&E costs are unknown and not viewed as a priority
 - Lack of incentive to reduce cost because cannot track them directly
- Philosophical differences between testing to original requirements vs. new adversary capabilities
- Accountability for risk trade-off decisions is not clear or consistent
- Perception that drive for zero risk is too strong and uncompromising
- Services can feel left out of final decisions and lack authorities to make final “calls” on suitability and effectiveness
- Lack of resources when additional testing is required creates pressure on budget and schedule
- DoD and industry are engaged in addressing the emerging challenges and generally work well together; but many view DoD process as bureaucratic and overly complex

Findings: Process (continued)

- Strategic Capabilities Office (SCO) offers alternatives to the current test approach
 - New take on the “development / test / deployment” method
- Misaligned incentives drive process participants to act in certain ways
 - Budget (PPBE), Requirements (JCIDS), Program Management, T&E

Findings: Infrastructure

- Infrastructure is aging and unlikely to be feasible or cost effective testing new or future technologies (e.g. cyber, hypersonics)
 - Legacy programs cited as reason for holding on to old and expensive assets – inadequate analysis of actual or opportunity costs
 - Causes overhead burden and need to find other private and public users to offset operations and maintenance costs
- Processes used for scheduling and testing are inconsistent among major test facilities
 - “Works fine as long as you know the right person”
- DoD building master database of government-owned testing assets
- Management metrics for T&E infrastructure are limited and applied inconsistently by services and locations
- Recognize need to move toward reducing physical testing through software and simulation, but leadership disagrees on potential impact and progress is slow

Findings: Industry

- No consistent model for DT and OT in industry
 - But, independence of T&E is valued, friction accepted/encouraged
- Product development cycles are shrinking
 - Urgency to be “first to market” for competitive advantage
- Industry in general is further along in the application of software and simulation for T&E
 - Important to reducing cost and time to market
 - Models are validated and supplemented by historical live testing data and select physical tests
- T&E costs are known and examined routinely

Findings: Industry (continued)

- Successful companies have common characteristics:
 - Rely on small, empowered and trusted teams to execute product development and appropriate DT and OT
 - Teams include leadership from business and engineering organizations who together make risk tradeoff decisions, with business leader generally holding the “final vote”
 - Apply extensive use of game theory and probability analytics to inform T&E decisions including risk calculations
 - Accept and incorporate cost disciplines throughout T&E process
 - To enable speed to market, they may accept competitive market gaps, relying on next generation to address them
 - Requirements “lock” and subsequent iterative development, testing, and fielding
 - Agreement going into a program among stakeholders about what successful achievement of requirements looks like and how success is measured

Recommendations: Process

- Create appropriate and direct accountabilities for T&E community, aligned with Program Management
 - Should have a stake in meeting budget, schedule and performance elements
 - Will require a greater involvement and commitment of T&E community at the beginning and throughout program life-cycle
 - Definitions of “success” should be agreed between PM and T&E community from the beginning and with changes that occur over time
 - Sharply limit the number and weight of stakeholders that have veto power (stated or implied) over TEMP development, implementation and modification
 - Clarify those with approval and veto power vs those who have advisory role

Recommendations: Process (continued)

- Strengthen Service voice in critical program decisions
 - Authorities should come from the Service Secretary to the Service Chief and designated subordinates
 - Supported by stronger more reasonable risk assessment determination as programs progress
 - Today's drive toward “zero risk” is an impossible standard and should not be used by the T&E community
 - Adopt “principled compromise” between absolute zero-defect test doctrine and situational operating requirements
 - “Tolerable” risk should be stated and quantified
 - Apply more consistent analysis of common data in the T&E process
 - Services are best positioned to determine “good enough” when program length results in new threats that didn't exist when requirements set
 - In effect the equivalent of the private sector “business” leaders in terms of influence on final fit for Service

Recommendations: Process (continued)

- Create Cost Discipline and Utilize as Critical Management Tool
 - Identify organization to take responsibility for documenting current costs – direct and indirect, military, civilian and contractor
 - Consider ASD Research & Engineering (ASD R&E), supported by OSD (Comptroller)
 - Establish management metrics based on these costs to identify improvement areas, including where resources are inadequate as well as where resources are redundant or inefficiently used
 - Creates better understanding of where money is spent today, facilitates better decisions regarding obsolete assets and facilities and provides a path forward for greater use of simulation and software tools
 - Do not create new organization, but instead rely on existing organizational elements to “own” their piece of the cost

Recommendations: Infrastructure

- Improve the effectiveness of T&E infrastructure through:
 - Common processes for enterprise-wide facility utilization
 - Develop and apply common utilization metrics
 - Continue efforts to build T&E asset data base
 - Aggressively invest in and utilize software based simulation to reduce percentage of T&E relying on physical testing
 - Adopt existing privatization tools to help recapitalize T&E and reduce the financial burden and risk of future needs of the government
 - Seek ways to integrate the methodological approach to agile development and testing being led today by the Strategic Capabilities Office