# Challenges to Enhancing DOD Systems Engineering and Developmental Testing Activities

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# **Agenda**

- Background
- Study Objectives
- Findings
- Conclusions
- Potential Fixes

# Background: Weapons Acquisition Program Investments

- 15 programs estimated at $77 billion entered

- 13 programs estimated at $147 billion exited

| Portfolio status | Fiscal year 2008 | Fiscal year 2010 |
|---|---:|---:|
| Number of programs | 96 | 98 |
| Total planned investment | $1.64 trillion | $1.68 trillion |
| Funding expended | $834 billion | $968 billion |
| Funding to complete | $802 billion | $712 billion |

Source: GAO analysis of December 2007 and December 2009 Selected Acquisition Reports.

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# Background: Weapon Acquisition Program Cost Trend Data

| FY 2011 dollars | Last 2 years (2008 to 2010) | Last 5 years (2005 to 2010) | Since first full estimate (Baseline to 2010) |
|---|---|---|---|
| Increase in estimated RDT&E costs | $15 billion 5 percent | $29 billion 10 percent | $102 billion 47 percent |
| Increase in estimated procurement costs | $121 billion 11 percent | $186 billion 18 percent | $287 billion 31 percent |
| **Increase in total acquisition cost** | **$135 billion 9 percent** | **$217 billion 16 percent** | **$402 billion 35 percent** |
| **Average delay in delivering initial capabilities** | **5 months 8 percent** | **9 months 13 percent** | **22 months 30 percent** |

# Background: RDT&E Percentage Cost Growth From Baseline per MDAP



**Summary Analysis**

**Average growth = 47 percent**
**Median growth = 21 percent**

**Total Cost Growth = $102 billion**
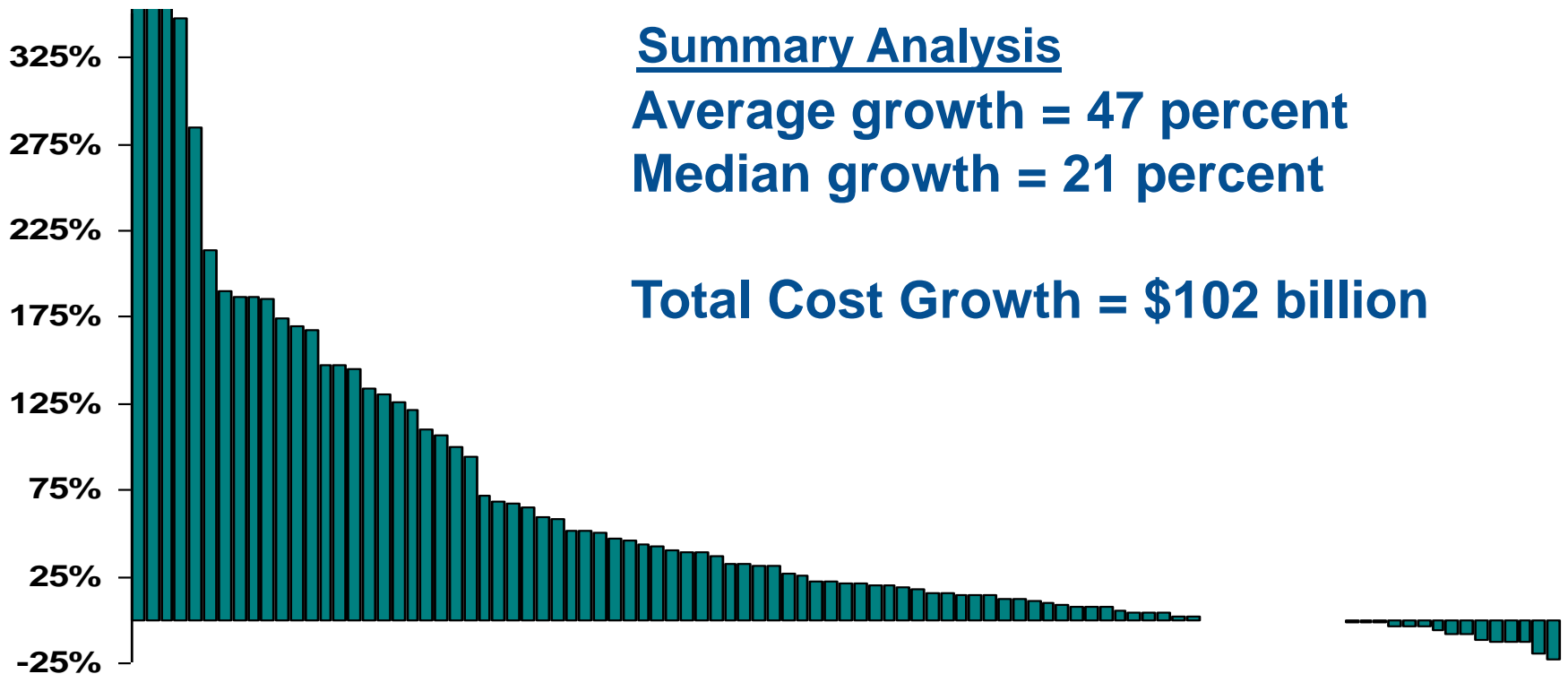
**Note: Four programs have greater than 325 percent RDT%E cost growth. The four programs that exceed 325% range from 348% to 3633%.**

# Background: New DOD Policies Could Improve Outcomes

- **More discipline and up-front knowledge in early acquisition phases could put programs on more stable footing**

  - Early Materiel Development Decision required for all programs
  - Preference for incremental development
  - **PDR required before system development start**
  - **Competitive prototyping required during technology development**
  - Configuration Steering Boards established to control requirements creep
  - Acquisition strategies required to describe measures taken to ensure competition throughout the program lifecycle
  - **Trade-offs among cost, schedule, and performance objectives required at Milestone B approval to ensure affordability**

# Background: Weapon System Acquisition Reform Act of 2009

The Reform Act created new OSD offices for systems engineering and developmental testing with responsibilities to

- Review and approve acquisition program planning documents
- Review, assess, and report on major acquisition programs
- Develop new policies
- Advocate for the respective workforces

# Study Objectives

1. Identify the progress DOD has made in implementing the Reform Act's systems engineering and developmental testing requirements

2. Determine whether there are resource issues the military services are facing that could impact their systems engineering and developmental testing activities

# Bottom Line

- Reform Act Implementation
  - DOD is continuing to increase its implementation efforts
  - Organizational challenges could limit the effectiveness of the systems engineering and developmental testing offices

- Military Service Challenges
  - Budget pressures are likely to stall workforce growth efforts and could impact developmental testing activities
  - Standardized metrics are not available to inform budget decisions

# Objective 1: Implementation Status

- On-going activities:  Since last year, both offices have:
    - Added more staff (mostly contractors)
    - Reviewed/approved more acquisition planning documents
    - Assessed activities on more weapon acquisition programs

- New activities:
    - The Deputy Assistant Secretary for Developmental Test and Evaluation is serving concurrently as the Director of the Test Resource Management Center
    - Offices have identified performance criteria to assess weapons acquisition programs

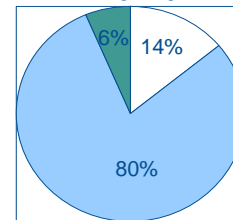# Objective 1: Implementation Status

Concerns identified:

- Both offices are relying heavily on contractors



**Systems Engineering
142 People**

20%

80%
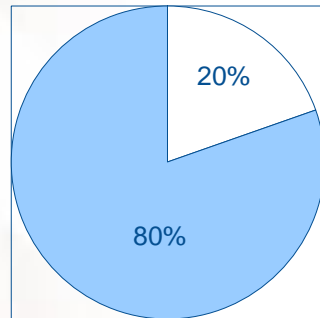
Government  Contractors

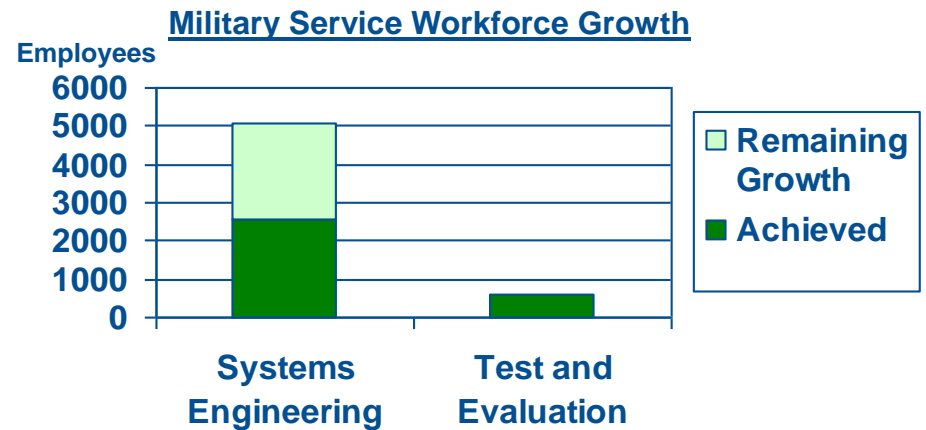**Developmental Test and Evaluation
63 people**

6%  14%

80%

Government  Contractors  Detailees

- Developmental testing office cannot provide full coverage to its portfolio of 250 acquisition programs

- Developmental testing office may not have enough influence

# Objective 2: Resource Challenges

- The military services made significant progress towards increasing their acquisition-coded workforce
  - Systems engineering has achieved half of growth goal
  - Test and evaluation has exceeded growth goal

- Most of the increases have come through new hires

**Military Service Workforce Growth**

Employees

Legend:
- Remaining Growth
- Achieved

Categories: Systems Engineering, Test and Evaluation

**Army and Navy Workforce Hiring and Insourcing Data**

Systems Engineering: Hiring 74%, Insourcing 26%

Test and Evaluation: Hiring 86%, Insourcing 14%
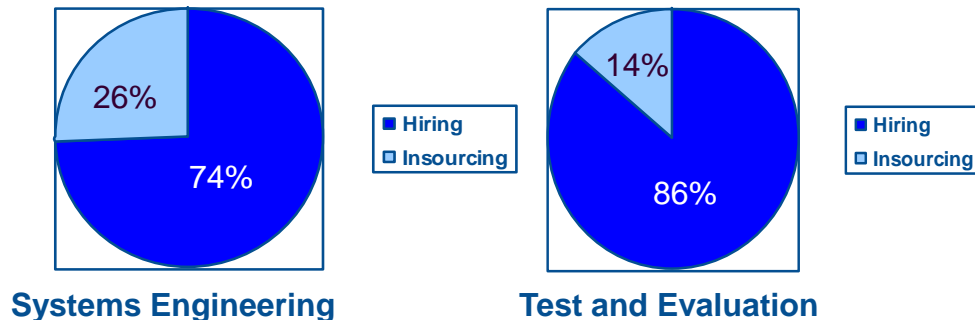
# Resource Challenges

- Based on the FY 12 President's Budget, the services plan to hire fewer systems engineers and more test and evaluation people than originally planned
  - Systems Engineering career field growth would be 10% instead of 14%
  - Test and Evaluation career field growth would be 6% instead of 4%

- Achieving additional growth will be difficult because of debt ceiling agreement and a clarification of DOD's insourcing policy

- Test ranges are having difficulty recruiting, hiring, training and retaining people

# Resource Challenges

- FY12 President's Budget includes cuts of nearly $1.2 billion (17 percent) to developmental test range budgets through FY 15
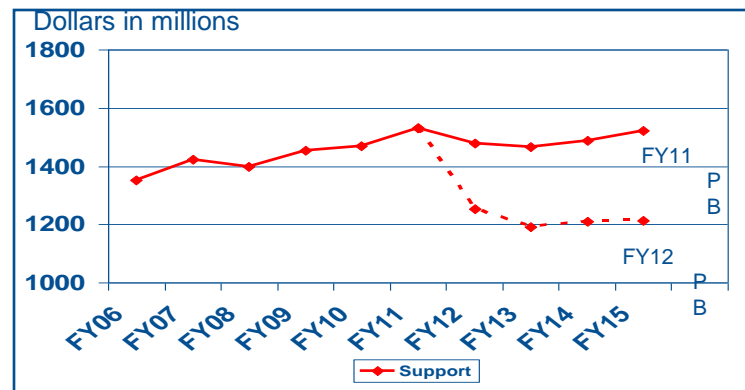


- Services do not know impact on weapons acquisition programs

- Services lack metrics that would help determine where to take cuts or make other funding decisions

# Conclusions

- DOD needs to provide the most effective systems engineering and developmental testing capability it can afford. However,
  - Developmental testing office is not as robust or efficient as it could be
  - DOD does not have a sound analytical basis for the size of its developmental testing office
  - Statutory provisions may limit DOD's ability to achieve efficiencies

- Services have increased their systems engineering and test and evaluation workforces, but future growth may be difficult.

- Service are not well positioned to make range funding decisions

# Recommendations

- Assess the resources and influence needed by the developmental testing office
- Develop metrics to aid in making personnel and funding decisions
- Determine impact of budget cuts and insourcing clarification on total workforce and the services' ability to meet program offices' systems engineering and test and evaluation needs

# **Questions?**

For additional information, please see GAO-11-806

You can also contact

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**GAO on the Web**

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# Military Service Workforce Data

| | Baseline | Workforce as of 9/30/10 | Goal by 9/30/2015 | Percentage of Growth Goal Achieved |
|---|---|---|---|---|
| **Systems engineering career field** | | | | |
| Air Force | 6,380 | 7,059 | 7,575 | 107% |
| Army | 10,615 | 12,076 | 10,938 | 91% |
| Navy | 17,961 | 20,870 | 19,012 | 91% |
| **Total** | **34,956** | **40,005** | **37,525** | **94%** |
| **Test and evaluation career field** | | | | |
| Air Force | 2,622 | 2,566 | 2,840 | 111% |
| Army | 2,135 | 2,297 | 2,211 | 96% |
| Navy | 2,652 | 2,829 | 2,977 | 105% |
| **Total** | **7,409** | **7,692** | **8,028** | **104%** |