An Assessment of Acquisition Outcomes and Potential Impact of Legislative and Policy Changes

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Presentation Objectives

- **Provide observations** on the Department's efforts to manage its 2009 portfolio of major weapon system programs, performance of newer programs, and ability to deliver to the warfighter on time
- **Analyze outcomes** and knowledge attained at key junctures in the acquisition process for a subset of the 42 programs primarily still in development
- **Gather data on other factors** that might impact program stability and outcomes such as: cost estimating, requirement setting, software management, and program office staffing
- **Provide an update** on any impacts from DOD acquisition policy changes and Congressional acquisition reform legislation

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Observations on DOD's Fiscal Year 2009 Major Defense Acquisition Program Portfolio

- DOD's major defense acquisition portfolio grew to 102 programs in July 2009 - a net increase of 6 programs since December 2007.
- Eighteen programs in the portfolio are newly designated major defense acquisition programs. The total acquisition cost of the thirteen new programs with cost data is over $72 billion.
- Twelve programs with a cost of $48 billion, including $7 billion in cost growth since their first estimate, left the portfolio. If FCS is included, these numbers increase to $179 billion and $48 billion respectively.
- The lack of complete Selected Acquisition Reports in 2009 precluded a definitive analysis of the overall cost and schedule performance of the portfolio.

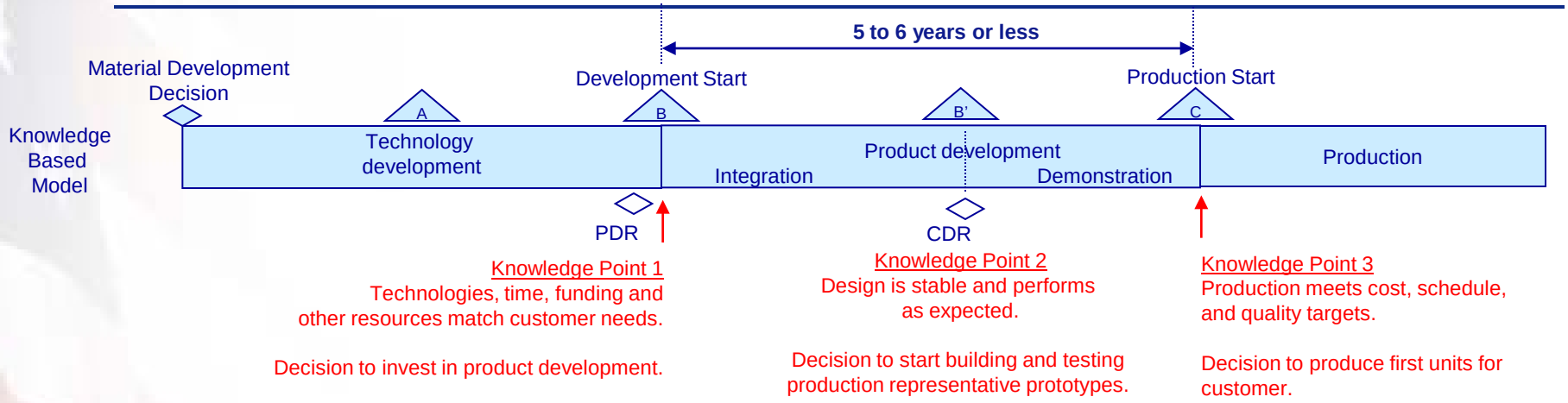
Observations on DOD's Fiscal Year 2009 Major Defense Acquisition Program Portfolio

- The Secretary of Defense's fiscal year 2010 budget recommended canceling or curtailing all or part of at least a half dozen major defense acquisition programs, including CSAR-X, DDG 1000, FCS, and VH-71.

	Weapon system	Secretary's comments
Recommended terminations	VH-71 Presidential Helicopter	Plan to develop options for new program
	Combat Search and Rescue Helicopter	Plan to reexamine requirements
	Next-Generation Bomber	Will not initiate new development program without better understanding of requirements and technology
	Future Combat Systems–Manned Ground Vehicles	Plan to reevaluate requirements, technology, and approach before relaunching and recompeting program
	Transformational Satellite	Plan to buy two more AEHF satellites as alternative
	Ballistic Missile Defense–Multiple Kill Vehicle	Plan to reexamine requirements; no mention of new program
Recommended end of production	C-17	Recommended ending production at 205 aircraft
	DDG 1000	Recommended ending production at 3 ships
	F-22	Recommended ending production at 187 aircraft.

Source: GAO analysis of DOD data.

A Knowledge-Based Approach is Key to Successful Program Outcomes



- Model provides framework for incremental, time certain (development constrained to 5 to 6 years or less), and knowledge-based approach to weapon system acquisitions.
- Success requires structured, disciplined application and adherence to model.
- Knowledge points align with key investment inflection points.
- Controls are in place for decisions makers to measure progress against specific criteria and ensure managers capture key knowledge before moving to next phase.

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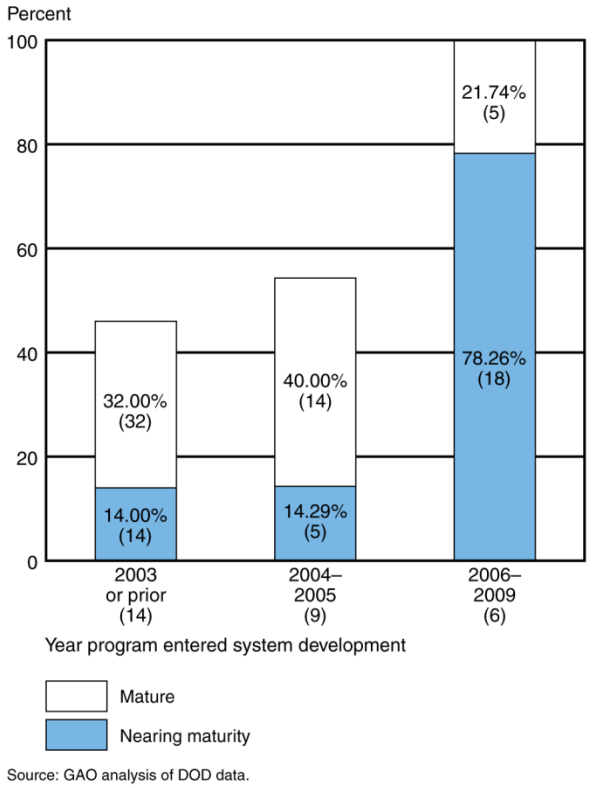
Programs Conducting Early Systems Engineering Have Better Outcomes

- Early systems engineering, ideally before a program enters development, is critical to ensuring that requirements are achievable and designable.
- We have previously reported that programs conducting key systems engineering events prior to development start experienced, on average, lower cost growth and shorter delays in achieving initial operational capability.
- Only 1 of the 37 programs in our 2010 assessment that held PDR did so before development start. The remaining programs, on average, held the review 30 months after development start.
- Preliminary design review now required prior to development start under the Weapon System Acquisition Reform Act of 2009.

Newer Programs GAO Assessed Are Starting with Higher Levels of Technology Maturity

- Since 2003, there has been an increase in the maturity of critical technologies at development start.
- All 6 programs entering system development from 2006 to 2009 had their critical technologies demonstrated in at least a relevant environment, in accordance with the DOD and statutory criteria.
- However, only 4 of the 29 programs in our 2010 assessment that provided data started development with fully mature critical technologies.

Maturity of Critical Technologies at Milestone B



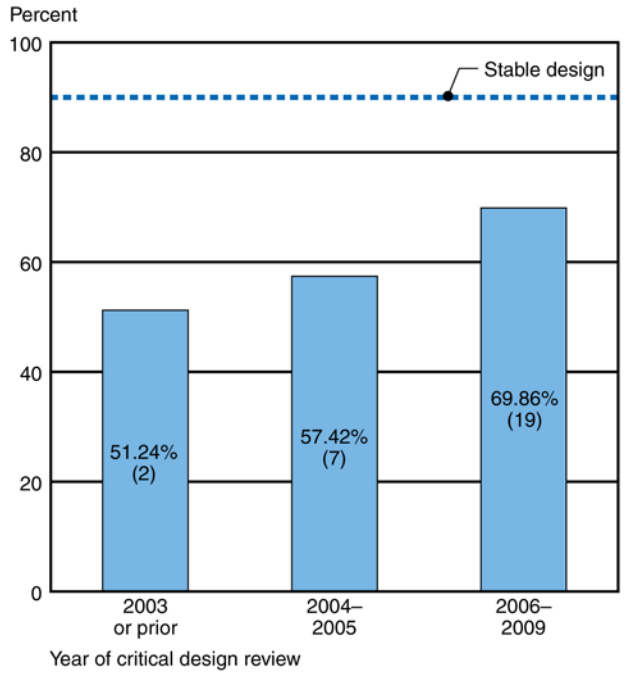
Source: GAO analysis of DOD data.

Note: Number of programs and technologies in parentheses.

Programs Holding Design Reviews in Recent Years Reported Having More Knowledge

- Since 2003, the average percentage of design drawings releasable for programs at the critical design review has steadily increased.
- However, designs, on average, are still far from stable and concurrent technology development increases the risk subsequent design changes and rework.
- Of the 28 programs in our 2010 assessment that held a critical design review, only 8 reported having a stable design.

Average Percent of Releasable Design Drawings at Critical Design Review



Source: GAO analysis of DOD data.

Note: Number of programs in parentheses.

Programs Are Not Testing Prototypes in Time to Prove Out Designs and Performance

- Programs should test integrated prototypes before critical design review to demonstrate that the design is capable of meeting requirements.
- Only 4 of 33 programs in our 2010 assessment tested or planned to test an integrated prototype before critical design review. The remaining programs reported that they will test these prototypes, on average, 31 months later.

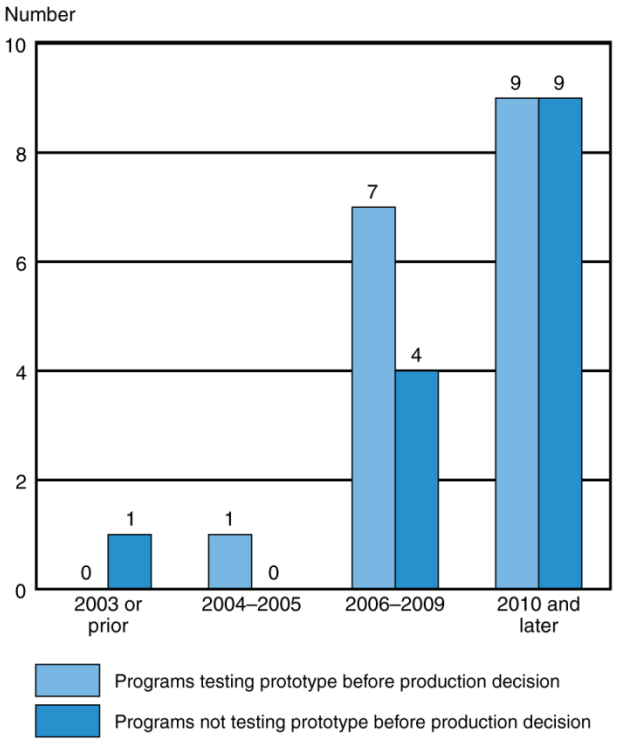
	Year of critical design review				
	2003 or prior	2004-2005	2006-2009	2010 or later	All programs
Number of programs testing before critical design review	1	0	3	0	4
Number of programs testing after critical design review	3	6	15	5	29
For programs testing after critical design review, average number of months from design review to prototype test	74	29	27	18	31

Source: GAO analysis of DOD data.

Programs Are Not Demonstrating Performance or Manufacturing Processes Before Production

- Programs should test production representative prototypes before production start and bring critical manufacturing processes into statistical control.
- Only 17 of the 31 programs in our 2010 assessment that reported a production date have tested or planned to test a production representative prototype before production.
- Only 7 programs in our 2010 assessment had identified their critical manufacturing processes.

Programs Testing Production Representative Prototype Before and After a Production Decision



Source: GAO analysis of DOD data.

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Observations on Other Factors That Can Affect Program Execution

- **Requirements:** Of the 42 programs in our 2010 assessment, 23 programs reported at least one change to a key performance parameter and 9 programs experienced at least one change to a key systems attribute since development start.

- **Software:** Seventeen of the 28 programs that reported software data estimated that software lines of code had grown by 25 percent or more since development start. The average lines of code growth was 92 percent.

- **Program office staffing:** Nineteen of 50 programs that responded to our staffing questions were able to fill all authorized positions. As a result, program offices reported that program management and oversight had been degraded, contracting activities had been delayed, and program management costs had increased as contractors were used to fill gaps.

Observations on Other Factors That Can Affect Program Execution

- Programs' reliance on non-governmental personnel continues to increase in order to make up for shortfalls in government personnel and capabilities.

Program Office Composition for 50 DOD Programs

	Program management	Engineering and technical	Contracting	Other business functions	Administrative support	Other	Total
Military	28%	7%	6%	3%	2%	5%	8%
Civilian government	40%	41%	74%	45%	18%	24%	40%
Total government	67%	47%	80%	48%	20%	29%	49%
Support contractors	32%	43%	20%	50%	78%	70%	45%
Other nongovernment	0%	9%	0%	3%	2%	1%	6%
Total nongovernment	33%	53%	20%	52%	80%	71%	51%

Note: Totals may not add due to rounding.

Source: GAO analysis of DOD data.

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New DOD Policies Could Improve Outcomes

- **Recent department initiatives may help focus on joint warfighter needs**
  - Functional COCOMs given greater voice in requirements process.
  - Preferred materiel solutions no longer identified in initial capability proposals, giving greater emphasis to trade-off analysis via AOAs.
- **New Capability Portfolio Management framework could facilitate more strategic investment choices**
  - Portfolio managers provided key input in recent budget cycle, but they do not have decision-making authority.
- **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, with baselines for each increment.
  - PDR required before system development start.
  - Competitive prototyping required as part of technology development phase.
  - Configuration Steering Boards established to control requirements creep.

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Weapon System Acquisition Reform Act Stresses Cost and Performance Assessment

- **Elevates the role of cost assessment and program evaluation**
  - Duties of Director, Cost Assessment and Program Evaluation (CA&PE) include reviewing cost estimates, conducting independent cost estimates, and approving the choice of baseline cost estimates for all ACAT ID programs.
  - Director, CAPE, will also formulate study guidance for analysis of alternatives.
- **Emphasizes importance of systems engineering and developmental test**
  - Established Directors of Developmental Test and Evaluation and Systems Engineering to oversee policy and guidance and approve test and systems engineering plans.
  - Requires services to periodically assess their capabilities in these areas.
- **Increases oversight and reporting on cost estimating, systems engineering, developmental test, program performance, and technology maturity.**
- **Stresses importance of competition throughout the acquisition cycle.**

Programs Have Begun to Implement DOD's Revised Acquisition Policies

- **Programs in our 2010 assessment have begun to implement acquisition reforms that could improve cost and schedule outcomes.**
  - Competitive prototyping – 8 of 10 pre-major defense acquisition programs in our assessment reported planning to develop competitive prototypes of the proposed weapon system or key system elements prior to Milestone B.
  - Early systems engineering – 7 of 10 pre-major defense acquisition programs in our assessment have already scheduled a preliminary design review before Milestone B.

- **Only a few programs in our 2010 assessment reported holding configuration steering board meetings in 2009.**
  - For 7 programs that held meetings in 2009, none reported that the board approved a requirement change or significant technical change.
  - One program presented de-scoping options to the board and had those approved to help maintain cost and schedule.

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Questions?