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DEFENSE ACQUISITIONS

Joint Action Needed by DOD and Congress to Improve Outcomes

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Why GAO Did This Study

DOD's acquisition of major weapon systems has been on GAO's high risk list since 1990. Over the years, Congress and DOD have continually explored ways to improve acquisition outcomes, including reforms that have championed sound management practices, such as realistic cost estimating, prototyping, and systems engineering. Too often, GAO reports on the same kinds of problems today that it did over 20 years ago.

This testimony discusses (1) the performance of the current acquisition system; (2) the role of a sound business case in getting better acquisition outcomes; (3) systemic reasons for persistent problems; and (4) thoughts on actions DOD and Congress can take to get better outcomes from the acquisition process. This statement draws from GAO's extensive body of work on DOD's acquisition of weapon systems and the numerous recommendations GAO has made on both individual weapons and systemic improvements to the acquisition process.

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What GAO Found

U.S. weapon acquisition programs often take significantly longer, cost more than promised and deliver fewer quantities and capabilities than planned. It is not unusual for time and money to be underestimated by 20 to 50 percent. As the Department of Defense (DOD) is investing \$1.4 trillion to acquire over 75 major weapon systems as of March 2015, cost increases of this magnitude have sizeable effects. When costs and schedules increase, the buying power of the defense dollar is reduced. Beyond the resource impact, consequences include the warfighter receiving less capability than promised, weapons performing not as well as planned and being harder to support, and trade-offs made to pay for cost increases—in effect, opportunity costs—not being made explicit.

GAO's work shows that establishing a sound business case is essential to achieving better program outcomes. A program should not go forward without a sound business case. A solid, executable business case provides credible evidence that (1) the warfighter's needs are valid and that they can best be met with the chosen concept, and (2) the chosen concept can be developed and produced within existing resources—such as technologies, design knowledge, funding, and time. Establishing a sound business case for individual programs depends on disciplined requirements and funding processes, and calls for a realistic assessment of risks and costs; doing otherwise undermines the intent of the business case and makes the above consequences likely.

Yet, business cases for many new programs are deficient. This is because there are strong incentives within the acquisition culture to overpromise a prospective weapon's performance while understating its likely cost and schedule demands. Thus, a successful business case is not necessarily the same as a sound one. Competition with other programs for funding creates pressures to overpromise. This culture is held in place by a set of incentives that are more powerful than policies to follow best practices. Moreover, the budget process calls for funding decisions before sufficient knowledge is available to make key decisions. Complementing these incentives is a marketplace characterized by a single buyer, low volume, and limited number of major sources. Thus, while it is tempting to describe the acquisition process as broken, it is more instructive to view it as in equilibrium: one in which competing forces consistently lead to starting programs with slim chances of being delivered on time and within cost.

Over the years, GAO has identified a number of reforms aimed at improving acquisition outcomes. Several of those are particularly relevant to changing the acquisition culture and will take the joint efforts of Congress and DOD:

- Ensure that new programs exhibit desirable principles before funding is approved.
- Identify significant program risks up front and allot sufficient resources.
- More closely align budget and program decisions.
- Mature technology before including it in product development.
- Develop system engineering and program manager capacity—sufficient personnel with appropriate expertise and skills.

Chairman Thornberry, Ranking Member Smith, and Members of the Committee:

I am pleased to be here today to discuss weapon systems acquisition reform. Weapon systems acquisition has been on GAO's high risk list since 1990.¹ Over the years, Congress and the Department of Defense (DOD) have explored ways to improve acquisition outcomes, including recent actions like the Weapon Systems Acquisition Reform Act of 2009 and the department's own "Better Buying Power" initiatives.² These and other reforms have championed sound management practices, such as realistic cost estimating, prototyping, and systems engineering. DOD's declining budgets and the impact of sequestration have lent additional impetus to reduce the costs of weapons. While some progress has been made on this front, too often we report on the same kinds of problems today that we did over 20 years ago.

Today, I will discuss (1) the performance of the current acquisition system; (2) the role of a sound business case in getting better acquisition outcomes; (3) systemic reasons for persistent problems; and (4) thoughts on actions DOD and Congress can take to get better outcomes from the acquisition process. This statement draws from our extensive body of work from 1990 until October 2015 on DOD's acquisition of weapon systems and the numerous recommendations we have made both on individual weapons and systemic improvements to the acquisition process. The work on which this testimony is based was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Problematic Acquisitions Continue

DOD has a mandate to deliver high-quality products to warfighters when they need them and at a price the country can afford. Quality and timeliness are especially critical to maintain DOD's superiority over

¹GAO, *High-Risk Series: An Update*, [GAO-15-290](#) (Washington, D.C.: Feb. 11, 2015).

²Pub. L. No. 111-23, as amended.

others, to counter quickly changing threats, and to better protect and enable the warfighter.

U.S. weapons are the best in the world, but the programs to acquire them frequently take significantly longer and cost more money than promised and often deliver fewer quantities and capabilities than planned. It is not unusual for time and money to be underestimated by 20 to 50 percent. Considering that DOD is investing \$1.4 trillion to acquire over 75 major weapon systems as of March 2015, cost increases of this magnitude have sizeable effects.³ Typically, when costs and schedules increase, the buying power of the defense dollar is reduced. Consequences associated with this history of acquisition include:

- the warfighter gets less capability than promised;
- weapons perform well, but not as well as planned and are harder to support; and
- trade-offs made to pay for cost increases—in effect, opportunity costs—are not explicit.

This state of weapon acquisition is not the result of inattention. Many reforms have been instituted over the past several decades, but the above outcomes persist. DOD is in the midst of a series of “Better Buying Power” initiatives begun in June 2010 that have resulted in some improvements, but it is too early to assess their long term impact.⁴

³GAO, *Defense Acquisitions: Assessments of Selected Weapon Programs*, [GAO-15-342SP](#) (Washington, D.C.: March 12, 2015).

⁴Office of the Under Secretary of Defense, Acquisition, Technology and Logistics Memorandum: “Better Buying Power: Mandate for Restoring Affordability and Productivity in Defense Spending” (June 28, 2010). Office of the Under Secretary of Defense, Acquisition, Technology and Logistics Memorandum: “Better Buying Power 2.0: Continuing the Pursuit for Greater Efficiency and Productivity in Defense Spending” (Nov. 13, 2012). Office of the Under Secretary of Defense, Acquisition, Technology and Logistics Memorandum: “Better Buying Power 3.0 Achieving Dominant Capabilities through Technical Excellence and Innovation” (April 9, 2015).

Key to Better Acquisition Outcomes: Better Business Cases

The decision to start a new program is the most highly leveraged point in the product development process. Establishing a sound business case for individual programs depends on disciplined requirements and funding processes. A solid, executable business case provides credible evidence that (1) the warfighter's needs are valid and that they can best be met with the chosen concept, and (2) the chosen concept can be developed and produced within existing resources—that is, proven technologies, design knowledge, adequate funding, and adequate time to deliver the product when it is needed. A program should not go forward into product development unless a sound business case can be made. If the business case measures up, the organization commits to the development of the product, including making the financial investment.

At the heart of a business case is a knowledge-based approach to product development that is both a best practice among leading commercial firms and the approach reflected in DOD's acquisition regulations. For a program to deliver a successful product within available resources, managers should demonstrate high levels of knowledge before significant commitments are made. In essence, knowledge supplants risk over time. Establishing a business case calls for a realistic assessment of risks and costs; doing otherwise undermines the intent of the business case and invites failure. This process requires the user and developer to negotiate whatever trade-offs are needed to achieve a match between the user's requirements and the developer's resources before system development begins. Key enablers of a good business case include:

- **Firm, Feasible Requirements**: requirements should be clearly defined, affordable, and clearly informed—thus tempered—by systems engineering; once programs begin, requirements should not change without assessing their potential disruption to the program.
- **Mature Technology**: science and technology organizations should shoulder the technology development burden, proving technologies can work as intended before they are included in a weapon system program. The principle here is not to avoid technical risk but rather take risk early and resolve it ahead of program start.
- **Incremental, Knowledge-based Acquisition Strategy**: rigorous systems engineering coupled with more achievable requirements are essential to achieve faster delivery of needed capability to the warfighter. Building on mature technologies, such a strategy provides time,

money, and other resources for a stable design, building and testing of prototypes, and demonstration of mature production processes.

- Realistic Cost Estimate: sound cost estimates depend on a knowledge-based acquisition strategy, independent assessments, and sound methodologies.⁵

Cultural Incentives Undermine Business Cases

An oft-cited quote of David Packard, former Deputy Secretary of Defense, is: “We all know what needs to be done. The question is why aren’t we doing it?”

We need to look differently at the familiar outcomes of weapon systems acquisition—such as cost growth, schedule delays, large support burdens, and reduced buying power. Some of these undesirable outcomes are clearly due to honest mistakes and unforeseen obstacles. However, they also occur not because they are inadvertent but because they are encouraged by the incentive structure. It is not sufficient to define the problem as an objective process that is broken. Rather, it is more accurate to view the problem as a sophisticated process whose consistent results are indicative of its being in equilibrium. The rules and policies are clear about what to do, but other incentives force compromises. The persistence of undesirable outcomes such as cost growth and schedule delays suggests that these are consequences that participants in the process have been willing to accept. These undesirable outcomes share a common origin: decisions are made to move forward with programs before the knowledge needed to reduce risk and make those decisions is sufficient. There are strong incentives within the acquisition culture to overpromise a prospective weapon’s performance while understating its likely cost and schedule demands. Thus, a successful business case—one that enables the program to gain approval—is not necessarily the same as a sound one.

Incentive to overpromise: The weapon system acquisition culture in general rewards programs for moving forward with unrealistic business cases. Strong incentives encourage deviations from sound acquisition practices. In the commercial marketplace, investment in a new product represents an expense. Company funds must be expended and will not

⁵GAO, *GAO Cost Estimating and Assessment Guide*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

provide a return until the product is developed, produced, and sold. In DOD, new products represent revenue, in the form of a budget line. A program's return on investment occurs as soon as the funding decision is made.⁶ Competition with other programs vying for defense dollars puts pressure on program sponsors to project unprecedented levels of performance (often by counting on unproven technologies) while promising low cost and short schedules. These incentives, coupled with a marketplace that is characterized by a single buyer (DOD), low volume, and limited number of major sources, create a culture in weapon system acquisition that encourages undue optimism about program risks and costs.

Program and Funding Decisions: Budget requests, Congressional authorizations, and Congressional appropriations are often made well in advance of major program decisions, such as the decision to approve the start of a program. At the time these funding decisions are made, less verifiable knowledge is available about a program's cost, schedule, and technical challenges. This creates a vacuum for optimism to fill. When the programmatic decision point arrives, money is already on the table, which creates pressure to make a "go" decision prematurely, regardless of the risks now known to be at hand.

Budgets to support major program commitments must be approved well ahead of when the information needed to support the decision is available. Take, for example, a decision to start a new program scheduled for August 2016. The new program would have to be included in the Fiscal Year 2016 budget. This budget request would be submitted to Congress in February 2015—18 months before the program decision review is actually held. It is likely that the requirements, technologies, and cost estimates for the new program—essential to successful execution—may not be very solid at the time of funding decisions. Once the hard-fought budget debates result in funds being appropriated for the program, it is very hard to take it away later, when the actual program decision point is reached.

To be sure, this is not to suggest that the acquisition process is foiled by bad actors. Rather, program sponsors and other participants act rationally

⁶For the purposes of this report, "funding decisions" refers to appropriations acts, authorization acts, and the DOD budget process.

within the system to achieve goals they believe in. Competitive pressures for funding simply favor optimism in setting cost, schedule, technical, and other estimates.

Insufficient Business Cases Are Sanctioned by Funding Approvals: To the extent Congress approves funds for such programs as requested, it sanctions—and thus rewards—optimism and unexecutable business cases. Funding approval—authorizing programs and appropriating funds—is one of the most powerful oversight tools Congress has. The reality is once funding starts, other tools of oversight are relatively weak—they are no match for the incentives to overpromise.

So, if funding is approved for a program despite having an unrealistic schedule or requirements, that decision reinforces those characteristics instead of sound acquisition practices. Pressure to make exceptions for programs that do not measure up are rationalized in a number of ways: an urgent threat needs to be met; a production capability needs to be preserved; despite shortfalls, the new system is more capable than the one it is replacing; and the new system's problems will be fixed in the future. It is the funding approvals that ultimately define acquisition policy.

Recently, I testified before the Senate Armed Services Committee on the Ford Class Aircraft Carrier.⁷ We reported in 2007 that ship construction was potentially underestimated by 22 percent, critical technologies were immature, and schedules were likely to slip. In other words, the carrier did not have a good business case. Nonetheless, funding was approved as requested. Today, predicted cost increases have occurred, the technologies have slipped nearly 5 years, and the program schedule has been delayed. Notably, the carrier represents a typical program without a good business case and its outcomes of cost increases and schedule delays are not unique. Funding approvals rewarded the unrealistic business case, reinforcing its success rather than that of a sound business case.

What to Do

Since 1990, GAO has identified a number of reforms aimed at improving acquisition outcomes. Several of those are particularly relevant to

⁷GAO, *Ford Class Aircraft Carrier: Poor Outcomes are the Predictable Consequences of the Prevalent Acquisition Culture*, [GAO-16-84T](#) (Washington, D.C.: October 1, 2015).

changing the acquisition culture and will take the joint efforts of Congress and DOD.

Reinforce desirable principles at the start of new programs: The principles and practices programs embrace are determined not by policy, but by decisions. These decisions involve more than the program at hand: they send signals on what is acceptable. If programs that do not abide by sound acquisition principles receive favorable funding decisions, then seeds of poor outcomes are planted. The challenge for decision makers is to treat individual program decisions as more than the case at hand. They must weigh and be accountable for the broader implications of what is acceptable or “what will work” and be willing to say no to programs that run counter to best practices. The greatest point of leverage is at the start of a new program. Decision makers must ensure that new programs exhibit desirable principles before funding is approved. Programs that present well-informed acquisition strategies with reasonable and incremental requirements and reasonable assumptions about available funds should be given credit for a good business case. Every year, there is what one could consider a “freshman” class of new acquisitions. This is where DOD and Congress must ensure that they embody the right principles and practices, and make funding decisions accordingly.

Identify significant program risks upfront and resource them: Weapon acquisition programs by their nature involve risks, some much more than others. The desired state is not zero risk or elimination of all cost growth. But we can do better than we do now. The primary consequences of risk are often more time and money and unplanned—or latent—concurrency in development, testing, and production. Yet, when significant risks are taken, they are often taken under the guise that they are manageable and that risk mitigation plans are in place. Such plans do not set aside time and money to account for the risks taken. Yet in today’s climate, it is understandable—any sign of weakness in a program can doom its funding. Unresourced risk, then, is the “spackle” of the acquisition system that enables the system to operate. This needs to change. If programs are to take significant risks, whether they are technical in nature or related to an accelerated schedule, these risks should be declared and the resource consequences acknowledged and provided. Less risky options and potential off-ramps should be presented as alternatives. Decisions can then be made with full information, including decisions to accept the risks identified. If the risks are acknowledged and accepted by DOD and Congress, the program should be supported.

More closely align budget decisions and program decisions: Requesting funding for programs 18 or so months ahead of when they will need it stems from a budgeting and planning process intended to make sure money is available in the future. Ensuring that programs are thus affordable is a sound practice. But, DOD and Congress need to explore ways to bring funding decisions closer in alignment with program decisions. This will require more thought and study. The alternative is that DOD and Congress will have to hold programs accountable for sound business cases at the time funding is approved, even if it is 18 months in advance of the program decision.

Separate Technology Development from Product Development: Leading commercial companies minimize problems in product development by separating technology development from product development and fully developing technologies before introducing them into the design of a system. These companies develop technology to a high level of maturity in a science and technology environment which is more conducive to the ups and downs normally associated with the discovery process. This affords the opportunity to gain significant knowledge before committing to product development and has helped companies reduce costs and time from product launch to fielding. Although DOD's science and technology enterprise is engaged in developing technology, there are organizational, budgetary, and process impediments which make it difficult to bring technologies into acquisition programs. For example, it is easier to move immature technologies into weapon system programs because they tend to attract bigger budgets than science and technology projects. Stronger and more uniform incentives are needed to encourage the development of technologies in the right environment to reduce the cost of later changes, and encourage the technology and acquisition communities to work more closely together to deliver the right technologies at the right time.

Develop system engineering and program manager capacity: Systems engineering expertise is essential throughout the acquisition cycle, but especially early when the feasibility of requirements are being determined, the technical and engineering demands of a design are being understood, and when an acquisition strategy for conducting production development is laid out. DOD has fallen short in its attempts to fill systems engineering positions.⁸ These positions should be filled and their

⁸GAO-15-290.

occupants involved and empowered early to help get programs on a good footing—i.e., a good business case—from the start. Program managers are essential to the success of any program. Program managers handed a program with a poor business case are not put in a position to succeed. Even with a good business case, program managers must have the skill set, business acumen, tenure, and career path to make programs succeed and be rewarded professionally. DOD has struggled to create this environment for program managers.

Concluding Remarks

Describing the current acquisition process as “broken” is an oversimplification, because it implies that it can merely be “fixed”. The current process, along with its outcomes, has been held in place by a set of incentives—a culture—that has been resistant to reforms and fixes. Seen instead as a process in equilibrium, it is clear that changing it requires a harder, long-term effort by both DOD and Congress. There have been a number of recent reforms directed at DOD. Congress shares responsibility for the success of these reforms in the actions it takes on funding programs, specifically by creating enablers for sound business cases, and creating disincentives for programs that do not measure up.

Chairman Thornberry, Ranking Member Smith, and Members of the Committee, this concludes my statement and I would be happy to answer any questions.

GAO Contact and Staff Acknowledgements

If you or your staff has any questions about this statement, please contact Paul L. Francis at (202) 512-4841 or FrancisP@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. GAO staff who made key contributions to this testimony are David Best, Assistant Director; R. Eli DeVan; Laura Greifner; and Alyssa Weir.

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