

Testimony of

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***Addressing Cost Growth of Major Department of Defense Weapons Systems***

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UNITED STATES SENATE

COMMITTEE ON HOMELAND SECURITY & GOVERNMENTAL AFFAIRS,  
SUBCOMMITTEE ON FEDERAL FINANCIAL MANAGEMENT, GOVERNMENT  
INFORMATION, FEDERAL SERVICES, AND INTERNATIONAL SECURITY

*The final component of the trusted relationship between the military services and the established defense industry concerns the reaction to program failures. Few development projects meet all of the official requirements set out in the contract. Very often, the resulting equipment turns out to be very capable anyway.... But the acquisition bureaucracy ... asks the reasonable question, “did the project fail to reach its upfront goals for bad reasons (e.g., because the contractor did not try hard enough or because the contractor over-promised ... during the competitive development phase ...), or did the project fail because of real technical constraints despite the best efforts of talented, hard-working engineers?”<sup>1</sup>*

Chairman Carper and Ranking Member Coburn, and members of the Committee, I appreciate the opportunity to discuss why cost overruns and schedule delays increasingly bedevil the Defense Department’s major systems.<sup>2</sup> I will attempt to explain some of the reasons for this not-unexpected outcome, offer a slightly different assessment of the importance of the problem, make two recommendations, and conclude with a discussion of two specific programs. Specifically, I recommend that DOD could achieve better results by: (1) more aggressively employing incentives and disincentives and (2) making a significant investment in human capital throughout the acquisition workforce, but particularly in the government’s program management and systems integration capacity.

**A Sobering Preface:  
Risk Reduction and “Unknown Unknowns”**

Major systems acquisitions are, by their very nature, challenging, complicated, and inherently risky. Specifically, it is overly optimistic to expect any institution to consistently advance the state of the art or employ significant, untested technological applications within firm

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<sup>1</sup> PETER DOMBROWSKI & EUGENE GHOLZ, *BUYING MILITARY TRANSFORMATION* 25-26 (2006).

<sup>2</sup> I commend the Government Accountability Office (GAO) for its excellent and informative work on this issue. *Defense Acquisitions: Assessments of Selected Weapon Programs*, GAO-08-467SP (March 2008).

budgets or schedules. Thus, while cost and schedule control are tremendously important, they are not the only measure of success. Indeed, the procedural steps of major systems acquisition require reliance upon budgets and schedules that, objectively, range from the notional and aspirational to the speculative. In the end, however, once deployed, a superb weapon system may provide excellent value for money for a government customer even if it was delivered late and its total cost exceeded its original contract price. This is not to diminish the importance of cost or schedule control, but this point is critical.

In acquiring major systems, fundamental pathologies – ranging from the absence of market forces on the buyer (a government customer), an unwieldy annual appropriations cycle (untethered from principles of capital budgeting), and a diffusion of responsibility (exacerbated by the interplay of political, military, civil servant, and contractor actors/agents) – conspire to make accountability maddeningly difficult to achieve.

A common theme that permeates contractual relationships involving major systems is haste in the formation of the contract, accompanied by the unstated assumption, by both parties, that problems will be worked out during contractual performance. Nowhere is this more true than where a program entails an effort to advance the state of the art or embark upon a multi-decade endeavor that will deploy an entirely new technology or product. In the rush to commence the process, both the government and the contractor frequently kick certain cans down the street. Specifically, rather than attempt to minimize the number of “unknown unknowns,”<sup>3</sup> or aggressively reduce performance risk, the government chooses upon a course of action, selects a partner, and works out many critical details later. A popular Pentagon adage, attributed to General George S. Patton, is that “a good plan executed violently today is better than a perfect plan tomorrow.” Because this practice is both understood and widely accepted, contractors willingly sign government contracts, despite the very real risk of catastrophic failure and monumental losses (and, of course, endless litigation). Experience teaches that the likelihood of catastrophic failure is *particularly* low for large-scale and/or long-term contracts involving major systems. As a general rule, because they are important, large government contracts are performed or successfully completed, not terminated, even if they may be late or over budget. The additional cost or time rarely justifies cancellation or starting over.

Potent institutional forces drive the government and the contractor to agree to contract pricing that subsequently proves unrealistic. Because DoD either will not or cannot pay for the

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<sup>3</sup> This phrase, commonly used in major system acquisition, reflects the reality that, as projects grow in size and complexity, the parties, at the moment of contract inception, simply do not know (yet) what they do not know. The phrase often is ridiculed, yet it represents a significant concept. See, e.g. John Tierney, *Political Points*, N.Y. TIMES, Dec. 7, 2003, at 128, “[T]he Plain English Campaign, the British group that awards the Foot in Mouth to a ‘truly baffling comment’ by a public figure, [selected a] statement by ... secretary [Rumsfeld] during a briefing on Iraq: ‘But there are also unknown unknowns -- the ones we don’t know we don’t know.’ Granted, it’s a tongue-twister[, b]ut ... it makes perfect sense. In fact, the problem of ‘unknown unknowns’ has been studied by economists, who call it ‘radical uncertainty’ and say it prevents consumers and businesses from making purely rational decisions.”

necessary R&D needed for systems to mature, contractors must over-promise in terms of price, schedule, and ability to achieve specifications. Thus, contractors submit proposals for immature technologies and commit to long-term delivery schedules fully cognizant that both technology and the government's needs (and wants) are rapidly evolving. This, in turn, leads to cost overruns and calls into question GAO's use of DoD's "expected returns" as a meaningful benchmark.<sup>4</sup> Thus, as noted above, DoD's "expected returns," frankly, are not truly expected.

Similarly, estimated "program costs" and lifecycle costs are, at best, hypothetical. In retrospect, few government consumers judge the success of a weapons program by comparing its total cost to its original estimate. Not only are memories short, but history is replete with examples of programs that long have exceeded even the most expansive expectations for their lifetimes. Like the aging aerial refueling fleet, discussed below, the Air Force continues to operate B-52 Bombers, none of which have been in service for fewer than 45 years, and expects to continue to do so.<sup>5</sup>

While cost overruns wreak havoc upon budgetary estimates and dilute public confidence in the system, under the current regime they are unavoidable and must be tolerated. Frequently, the alternatives to cost overruns are limited and unattractive. The contract could be stopped, squandering the investment made to that point. The government could accept an end product less effective than what is otherwise available. Or the contractor could suffer a potentially devastating loss. Here I caution against the instinct to suggest that contractors alone should bear the risk of loss. The nature of the contractual relationship between the government and its contractors is intended not only to make the contractor whole, but also to permit the contractor to earn a profit on its work.<sup>6</sup> (If the government does not believe that the profit motive will

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<sup>4</sup> GAO-08-467SP at 6.

<sup>5</sup> Although "[a] total of 744 B-52s were built, ... the last, a B-52H, [was] delivered in October 1962. Only the H model is still in the Air Force inventory[.] Updated with modern technology the B-52 ... will continue into the 21st century as an important element of our nation's defenses. Current engineering analyses show the B-52's life span to extend beyond the year 2040." Air Force Link, <http://www.af.mil/factsheets/factsheet.asp?fsID=83&page=2>. But see, Anthony Murch, *The Next Generation Bomber: Background, Oversight Issues, and Options for Congress*, at 5 (March 7, 2008) (suggesting that "the Air Force's operational assessment is that the B-52 will not be survivable under the 2015-2020 threat picture, and ... its effectiveness and utility could be limited....").

<sup>6</sup> "It is in the Government's interest to offer contractors opportunities for financial rewards sufficient to stimulate efficient contract performance... Both the Government and contractors should be concerned with profit as a motivator of efficient and effective contract performance. Negotiations aimed merely at reducing prices by reducing profit, without proper recognition of the function of profit, are not in the Government's interest. [E]xtremely low profits ... do not provide proper motivation for optimum contract performance." 48 C.F.R. § 15.404-4(a)(2), (3). See also Phil W. Bolin & James S. O'Brasky, *Defense Acquisition Needs to Change Course*, PROGRAM MANAGER, Mar.-Apr. 2001, at 10, 19 (The primary motive of the defense industrial base is profit. "This is not a criticism ... but recognition of a basic fact....").

produce the best possible result, it should consider state-run enterprise. I do not advocate this approach.)

Because life is full of uncertainties, one of the defining traits of government contracts is the frequency with which they are modified or changed during contractual performance. Standard government contracts, and specifically large, complicated, long-term agreements, are defined by their ability to address anticipated and unanticipated contingencies.<sup>7</sup> Standardized contract clauses allocate – between the parties – the risk of frequently anticipated contingencies.<sup>8</sup> The hallmark of these remedy-granting clauses is their methodical endeavor to control contingencies by (1) demanding that contractors not pad their bids or offers (or, in effect, insulate themselves) when competing for government business<sup>9</sup> and (2) reassuring those contractors that the government will equitably adjust contracts to reimburse for unforeseen contingencies.<sup>10</sup> In other words, *in exchange for the contractor's willingness not to inflate its initial contract price to insulate itself against certain risks (or contingencies), the Government agrees to make the contractor whole if and when such contingencies occur.*

Later, when unanticipated contingencies arise that require the contractor to incur additional costs, the contracting officer and the contractor can agree upon compensation.<sup>11</sup> This,

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<sup>7</sup> A contingency is: “a possible future event or condition arising from presently known or unknown causes, the outcome of which is indeterminable at the present time.” 48 C.F.R. § 31.205-7(a).

<sup>8</sup> See, e.g., the Changes clause, 48 C.F.R. § 52.243-1; the Termination for Convenience clause, 48 C.F.R. § 52.249-2; the Differing Site Conditions clause, 48 C.F.R. § 52.236-2; and, *inter alia*, the Government Furnished Property clause, 48 C.F.R. § 52.245-2(a)(3), (4) (in anticipation of potentially defective, or late delivery of, government furnished property). See, also, *Foster Construction C.A. v. United States*, 435 F.2d 873, 887 (Ct. Cl. 1970) (“long-standing, deliberately adopted procurement policy” that bidders “need not consider how large a contingency should be added to the bid to cover the risk.”); Richard J. Kendall, *Changed Conditions As Misrepresentations in Government Construction Contracts*, 35 GEO. WASH. L. REV. 978, 979-82 (1967); Joshua I. Schwartz, *Liability for Sovereign Acts: Congruence and Exceptionalism in Government Contracts Law*, 64 GEO. WASH. L. REV. 633, 695-97 (1996).

<sup>9</sup> Contingencies “that may arise from presently known or unknown conditions, the effect of which cannot be measured so precisely as to provide equitable results to the contractor and to the Government . . . are to be excluded from cost estimates . . . but should be disclosed separately . . . to facilitate the negotiation of appropriate contractual coverage.” 48 C.F.R. § 31.205-7(c)(2).

<sup>10</sup> See generally, Ralph C. Nash, Jr., *Risk Allocation in Government Contracts*, 34 GEO. WASH. L. REV. 693, 698-99 (1966) (“terms and conditions . . . attempt . . . to define the remedies . . . for most foreseeable contingencies that may occur. . . Little is left to the workings of the common law of contracts since these standard terms and conditions represent a relatively thorough statement of intended risk allocation.”).

<sup>11</sup> The parties can modify the contract. 48 C.F.R. § 43.103(a). If that fails, the contractor can file a claim and ultimately sue. 48 C.F.R. §§ 33.2, 33.206, 52.233-1; 41 U.S.C. §

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of course, tends to increase the original contract price or, in other words, result in an overrun. But, remember, the alternative was for the government to have agreed to a higher contract price at the outset.

### **Simple Solution, Difficult Implementation**

Accordingly, if cost control and schedule discipline are important, better results can be achieved by (1) slowing down the process, (2) breaking down programs into more clearly defined stages or, in other words, distinguishing between basic research, demonstration and validation of a concept, prototyping or low rate initial production, and, only later, full-scale production; and (3) imposing discipline (or gates) ensuring that programs do not progress to subsequent stages until technological and design issues have been resolved. GAO correctly points out that: “A knowledge-based acquisition approach can lead to better outcomes.” Indeed, the most important prerequisite to better cost and schedule results on major systems is mandating the existence of “mature technologies, stable design, and mature production processes” before commencing. That’s true, but it’s not easy.

GAO is correct to suggest that, before DOD bets the farm on a technological solution, “the technologies needed to meet essential product requirements [should] have been [proven] to work in their intended environment.” But fully 88 percent of the programs studied “‘fell short of achieving [this] knowledge point[.]’” Further, “[k]nowing that a product’s design is stable before system demonstration reduces the risk of costly design changes occurring during the manufacturing of production representative prototypes—when investments in acquisitions become more significant.” Yet, in at least one out of every three major programs studied, DOD encouraged its contractors to commence the manufacturing process before design was complete. DOD “continu[es] to develop weapons system in a highly concurrent environment, which forces acquisition programs to manage technology, design, and manufacturing risks at the same time and [thus, unavoidably] can lead to waste from costly rework.” To exacerbate this problem, “[r]ather than seeking to reduce risk early in programs, DOD’s common practice ... has been to create aggressive risk mitigation plans in its programs after poor investment decisions have been made.”<sup>12</sup>

Unfortunately, the government (often, appropriately) neither wants to pay for necessary research to reach that stage, nor does it enjoy the patience to mandate demonstration and validation.<sup>13</sup> That’s why we rarely see fully functional prototypes – think “fly before your buy,”

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<sup>12</sup> GAO-08-467SP at 15-22.

<sup>13</sup> GAO-08-467SP at 12, et seq. “Schedule elongation on a research and development (R&D) project that is composed almost entirely of the technology development core team is relatively inexpensive compared to holding up a large program, burdened with sizable overhead and product teams unrelated to the emerging technology.” Dennis K. Van Gemert and Martin Wartenberg, *Lessons Learned in Acquisition Management*, 45 DEFENSE

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or, even better, competitive prototypes – before major system production contracts begin. Dramatic cultural change would be required to generate the necessary funds and patience to complete research and development before production. And it may not be worth it.

The private sector model only takes us so far. Whether viewed through a business or an economics lens, the fundamental rationale for why institutions invest capital in innovation – which depends upon the profit motive – does not translate well to major defense systems.

[B]usiness choices to invest in military innovation ... are channeled by military and political forces rather than directly responding to traditional financial calculations. ... When firms are spending the government's [R&D] money rather than their own, the profit motive does not provide the traditional incentive to innovate....

[D]efense firms hesitate to spend their own money (profits) on R&D investment ... [because they] cannot hope to earn very high profits from production ... because the government buyers impose profit caps.... Even more important, the military customers' interest in controlling the characteristics of the weapons that they buy often leads them to reject systems proffered by contractors when government-determined requirements did not define the original product specifications.<sup>14</sup>

Here, GAO's report fails to grapple with a root cause of many of these problems. Increasingly, for a host of reasons, the government is neither patient enough to demand, nor willing to pay the appropriate costs of the research and development necessary to achieve, the kind of knowledge-based acquisition the GAO's report envisions. Accordingly, contractors must enter major systems contracts or programs willing to invest and lose money – often staggering sums of money – on bid and proposal costs, R&D, and, typically, low rate initial production – all in the hope of someday recouping their return on investment during full-scale production and, increasingly, foreign military sales. That's high stakes poker.

### **Meaningful Incentives and Disincentives**

*Before the ... business/acquisition model can change, the DoD and Congress must shift from a posture of "maximum risk avoidance" to an objective of "effective and efficient acquisition risk management."<sup>15</sup>*

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ACQUISITION REVIEW JOURNAL 133 (September 2007).

<sup>14</sup> DOMBROWSKI & GHOLZ, at 20-21.

<sup>15</sup> Report of the Defense Science Board Task Force on Defense Industrial Structure for Transformation, *Creating an Effective National Security Industrial Base for the 21st Century: An Action Plan to Address the Coming Crisis*, at 50 (July 2008), <http://www.acq.osd.mil/dsb/reports/2008-07-DIST.pdf>.

Both the military and the public would be ill served if Congress paralyzed the acquisition system in the name of cost and schedule discipline. Accordingly, DOD may find that injecting meaningful incentives and disincentives into the process can help achieve better results. Two quick examples may illustrate the point.

I happened to be in Minneapolis last week, when, with much fanfare, the Minnesota Department of Transportation opened the new, high-tech, span replacing the I-35 bridge that collapsed on August 1, 2007. The Minnesota DOT awarded the contract – worth more than \$230 million – with a firm deadline, but employed significant incentives and disincentives. While disincentives, in the form of liquidated damages, are quite common in the construction industry, the Minnesota DOT successfully employed incentives: specifically, a \$200,000-a-day “bonus” for every day that the contractor completed the project early. By delivering a completed bridge months before the established deadline, the contractor reaped a bonus in the \$20 million range.<sup>16</sup>

On a larger scale, the Department of Energy employed extremely lucrative incentives when faced with the cleanup of the Rocky Flats Environmental Technology Site, a project that many perceived as not only difficult, but unlikely to be accomplished at all.

DOE and Kaiser-Hill successfully partnered in a 10-year effort to complete the largest, most complex environmental cleanup project in United States history and converted an environmental liability into a community asset, completing the project nearly fifty years and \$30 billion below initial estimates. ... A key element in the successful project was a unique, incentive-driven contract between DOE and Kaiser-Hill that rewarded schedule and cost savings while maintaining outstanding safety and protection of human health and the environment.<sup>17</sup>

Kaiser Hill completed the \$3.96 billion contract for approximately \$3.44 billion, and attributes much of its success to a profit sharing regime through which it “tied individual rewards to organizational success. Over 20% (\$100 million) of KH’s incentive fee was used to motivate employees to work safer, faster and smarter.”<sup>18</sup> To be clear, this approach made a number of contractors very wealthy. But it is difficult to find a more satisfied government customer.

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<sup>16</sup> 35W Bridge Design-build Project, <http://www.dot.state.mn.us/designbuild/35wbrproject.html>. As an aside, the bridge design-build contract was competed in an admirably transparent manner, employing a best value, rather than low price approach. The successful contractor proposed the highest price of the four offerors, but also received the highest technical proposal score.

<sup>17</sup> U.S. Department of Energy, DOE’s Rocky Flats Cleanup Site Named 2006 Project of the Year By Project Management Institute (October 23, 2006) <http://www.energy.gov/news/4398.htm>.

<sup>18</sup> 2007 Nova Award Nomination, Rocky Flats Closure Project, <http://www.cif.org/nom2007/nom-2007-13.pdf>.

Thus, it is imperative to remember that, for many major systems, cost and schedule are not the only measures, nor are they often the most important metric. For example, incentives and disincentives may more effectively be employed for critical performance specifications. For a developmental aircraft program, depending upon its purpose, delays in schedule or increases in price may be justified to maintain or even increase performance in terms of speed, range, capacity, take-off speed, maneuverability, etc. Of course, the permutations for applying incentives and disincentives are endless.

Modern era revisions to the DOD's profit policy, expressed through its Weighted Guidelines approach, have generated greater flexibility in this regard. The DOD Federal Acquisition Regulation Supplement (DFARS) offer two somewhat recent opportunities to exploit this approach – a technology incentive and a cost efficiency factor.<sup>19</sup>

Unfortunately, any effort to aggressively employ profit policy is challenging in federal procurement. A host of well-intentioned participants believe they are serving the public good by artificially suppressing contractor profits or, as they see it, controlling excessive profits.<sup>20</sup> In the end, the weighted guidelines and the government's profit policy serve not to maximize, but to limit, the utility of profit as a motivational tool. So long as this instinct prevails in political Washington, market-based incentives and disincentives cannot serve as the primary tool for government to maximize the value it receives for the taxpayers' dollars.

### **Program Management and the Acquisition Workforce**

GAO appropriately focuses upon the government's human capital crisis and its impact on these issues.<sup>21</sup> In previous testimony before this Committee, I advocated that the government acquisition or contracting workforce – understaffed, under-resourced, and under-appreciated – desperately requires a dramatic recapitalization. No investment could have a greater impact on

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<sup>19</sup> While the “normal value” for standard technological risk, which reflects “the technical uncertainties of performance,” is in the five percent range, the technology incentive increases the “normal value” to nine percent. “For the technical factor only, contracting officers may use the technology incentive range for acquisitions that include development, production, or application of innovative new technologies.” 48 C.F.R. § 215.404-71-2(c)(2). In addition, the “special [cost efficiency] factor provides an incentive for contractors to reduce costs. To the extent that the contractor can demonstrate cost reduction efforts that benefit the pending contract, the contracting officer may increase the prenegotiation profit objective by an amount not to exceed 4 percent of total objective cost ... to recognize these efforts....” 48 C.F.R. § 215.404-71-5(a). See also, Alan S. Gilbreth and Sylvester Hubbard, *How to Make Incentive and Award Feeds Work*, 48 DEFENSE ACQUISITION REVIEW JOURNAL 133 (July 2008).

<sup>20</sup> William E. Kovacic and Steven L. Schooner, *A Modest Proposal to Enhance Civil/Military Integration: Rethinking the Renegotiation Regime as a Regulatory Mechanism To Decriminalize Cost, Pricing, and Profit Policy* (1999 Defense Systems Management College Acquisition Research Symposium, June 21-23, 1999), available at <http://ssrn.com/abstract=86998>.

<sup>21</sup> GAO-08-467SP at 29 et seq.

injecting fiscal responsibility into an annual investment exceeding \$400 billion. While this topic is too broad to be addressed at length here, three points are critical: (1) at a macro level, the acquisition workforce crisis is significant and pervasive, and it will adversely impact government procurement for the foreseeable future; (2) more specifically, the government under-invests in program management expertise; and (3) the government under-invests in systems integration capacity.

The Congressionally created Acquisition Advisory Panel found that: “The federal government does not have the capacity in its current acquisition workforce necessary to meet the demands that have been placed on it.”<sup>22</sup> The government has not sufficiently invested in its acquisition workforce since the 1980’s, precipitating a crisis even before the massive post-2000 increase in federal procurement spending. GAO’s report provides more evidence of the extent of the hollowing out of critical program management offices.

DOD relies heavily on contractors to perform roles that have in the past been performed by government employees. For programs [GAO] assessed, 48 percent [or nearly half] of their staff was made up of individuals outside of the government; performing engineering, business, and supporting program management related roles. [GAO concluded that:] These data raise questions about whether DOD has the appropriate mix of staff and capabilities within its workforce to effectively manage programs.<sup>23</sup>

Nowhere is it more evident that DOD lacks appropriate staffing than in its increasing inadequacy of post-award contract management resources. Ultimately, a program – in operation – depends upon a series of contractual arrangements. And no matter how sound the terms of a written contract may be, the outcome depends upon how the government customer and the contractor manage their relationship and ensure that the customer receives value for money.

Contract management is the essential post-award contracting function to ensure mission accomplishment, and it is an important control over fraud,

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<sup>22</sup> Acquisition Advisory Panel Final Report at 361, available at [www.acquisition.gov/comp/aap/finalaapreport.html](http://www.acquisition.gov/comp/aap/finalaapreport.html). Agencies have failed to perform systematic human capital planning to assess their acquisition workforce, either in the present or with an eye towards the future. Also, “[w]hile the private sector invests substantially in a corps of highly sophisticated, credentialed and trained business managers to accomplish sourcing, procurement and management of functions, the government does not make comparable investments.” See, also, Steven L. Schooner & Daniel S. Greenspahn, *Too Dependent on Contractors? Minimum Standards for Responsible Governance*, 6 J. OF CONT. MGMT 9 (Summer 2008), <http://ssrn.com/abstract=1263358>; the Professional Services Council (PSC) and Grant Thornton’s Troubling Trends survey, *Acquisition Workforce Top Concern for Federal Managers, Survey Says*, [www.pscouncil.org/pdfs/2006PSCProcurementPolicySurvey.pdf](http://www.pscouncil.org/pdfs/2006PSCProcurementPolicySurvey.pdf); Steven L. Schooner, *Feature Comment – Empty Promise for the Acquisition Workforce*, 47 GOV’T CONTRACTOR ¶ 203 (May 4, 2005), <http://ssrn.com/abstract=719685>.

<sup>23</sup>

GAO-08-467SP at 5-6.

waste, and abuse.... With not enough [administrative contracting officers], [purchasing or procuring contracting officers] could do this - but they are too busy and *therefore it is not being done*....<sup>24</sup>

Leadership is also tremendously important, and a popular perception is that a visionary, a single uniquely talented or particularly dynamic individual, is critical to the success of any major program. In addition, GAO is correct in suggesting that the government (military or civil service, let alone at the political level) might obtain better results by “making it clear who is responsible for what and holding people accountable when responsibilities are not fulfilled.”<sup>25</sup> But, here, the differences between the government and private sector model are stark. Private industry not only employs significant monetary incentives, but it provides key personnel with stability. Among the uniformed ranks, stability is anathema, as frequent rotation and diversity of assignments (but almost always including command) are necessary for promotion.

In addition, despite their importance to successful major system acquisition, inadequate systems integration resources remain with DOD.

Systems integrators analyze alternatives, make necessary tradeoffs between cost and performance, and sequence decisions so that early architectural choices do not limit the future expansion and adaptation of the system or systems.

Responsibility for integration ... is not easy to find ... [within DOD].... In-house capabilities for full-scale systems-of-systems integration have been weakened by years of cutbacks and retirements. Even more disheartening, systems integration ... is poorly understood.... [F]ew program managers have the resources, technical know-how, authority, and organizational clout to ensure that sound decisions about system-design tradeoffs are made.<sup>26</sup>

I encourage the Committee to examine the recent Defense Science Board report on the National Security Industrial Base. One of its primary findings was that: “A weakened DoD acquisition workforce impedes the acquisition of military capability and government oversight[.]” The expert group emphasized the shortages in the essential skills of systems engineering and program management. Not surprisingly, the Report recommended that DoD

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<sup>24</sup> Commission on Army Acquisition and Program Management in Expeditionary Operations, “Urgent Reform Required: Army Expeditionary Contracting,” October 31, 2007, available at [www.army.mil/docs/Gansler\\_Commission\\_Report\\_Final\\_071031.pdf](http://www.army.mil/docs/Gansler_Commission_Report_Final_071031.pdf) (emphasis added).

<sup>25</sup> GAO-08-467SP at 28. Although policy and practice envision a scenario in which the program manager is the single point of program accountability, “program managers may now have fewer resources to manage their programs as they spend much of their time and budgets managing the bureaucracy.” John T. Dillard, *Toward Centralized Control of Defense Acquisition Programs*, 40 DEFENSE ACQUISITION REVIEW JOURNAL 133 (August 2005).

<sup>26</sup> DOMBROWSKI & GHOLZ, at 143-44.

“[m]ove aggressively to strengthen the future, high-quality, high-skill, Government Acquisition Workforce.”

The Department should also strengthen the management of programs, systems engineering, production and logistics support -- all inherently governmental management positions requiring high skills and experience. Industry-to-government and government-to-industry rotations should also be encouraged. Lost acquisition general officer positions should be introduced as incentives for military acquisition careers. **In this new security environment, the acquisition management challenges are far greater and the government must have the top people, with the necessary training and authority, to achieve success.**<sup>27</sup>

### Two Anecdotes

Despite the bad news presented, GAO attempts to suggest that there is reason for optimism.<sup>28</sup> If your interest in major systems is how they perform in terms of cost and schedule discipline, I do not share that optimism. Let me conclude with two anecdotes (or harbingers); one addressed by the report, and one of which is related to, but technically outside the scope of the report.

### Future Combat System

The Future Combat System (FCS), discussed in GAO’s report,<sup>29</sup> merits attention because it previously proceeded pursuant to the artfully-named “other transactions authority.”

The FCS program is managed by a lead systems integrator group.... *Although widely criticized, the Army adopted this program management approach largely because it did not have enough acquisition, scientific, and engineering staff to manage a program of this complexity and scope. ... [U]se of an Other Transaction Authority (OTA) agreement in lieu of a more structured Federal Acquisition Regulation (FAR) contract raised a number of concerns regarding program oversight and protecting the taxpayer’s interests. Partly due to Congressional pressure, the Army recently decided to change from an OTA to a more traditional contract, although specific details at this point are few.*<sup>30</sup>

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<sup>27</sup> Defense Science Board at 10, 42-44.

<sup>28</sup> GAO-08-467SP at 6.

<sup>29</sup> GAO-08-467SP at 89-90.

<sup>30</sup> Andrew Feickert, *The Army’s Future Combat System (FCS): Background and Issues for Congress*, Congressional Research Service (April 28, 2005) (emphasis added), [http://www.ndu.edu/library/docs/crs/crs\\_rl32888\\_28apr05.pdf](http://www.ndu.edu/library/docs/crs/crs_rl32888_28apr05.pdf) (“FCS entered the [System Development and Demonstration] SDD phase in May 2003 despite GAO warnings ... [of] ‘more (continued...)’

The “other” in OTA meant that – although the transaction was an acquisition (in that the government planned to acquire goods and services in exchange for billions of appropriated funds) and the vehicle for doing so was a contract (a bargain in which the government exchanges money for value) – the agency could do so outside of the Congressionally-mandated acquisition regime and, more specifically, the Federal Acquisition Regulation (FAR). Thus, OTAs, as a general rule, are neither transparent nor well regulated, nor are they designed with an eye towards damage control if things go awry. Accordingly, I commend those that caused the FCS to transition from an OTA to a legitimate vehicle, and I encourage the Congress to aggressively limit OTA authority in the future.

But the FCS is also an important anecdote because it demonstrates the limits on the primary programmatic metrics at issue today: cost and schedule. FCS is an ambitious, far-reaching program that:

consists of an integrated family of advanced, networked combat and sustainment systems; unmanned ground and air vehicles; and unattended sensors and munitions intended to equip the Army’s new transformational modular combat brigades. Within a system-of-systems architecture, FCS features 14 major systems and other enabling systems along with an overarching network for information superiority and survivability.

The Army, which touts FCS as the “cornerstone of Army Modernization” explains that:

FCS is not just a technology development program - it is the development of new Brigade Combat Teams - these new brigades, with more infantry, better equipment, unmatched situational awareness and communications allowing complete domination in asymmetric ground warfare while allowing the Army to build a force that can sustain itself in remote areas.<sup>31</sup>

At some point, we must concede that, particularly for evolutionary technologies, cost and schedule estimates spanning more than five, and as many as a dozen years, are more likely to experience change than remain static or true to expectation. For example, GAO notes that:

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(...continued)

risk than recommended by best practices or DOD guidance.”). See also, generally, 10 U.S.C. § 2371, 10 U.S.C. § 845, and 42 U.S.C. § 7256; GAO-05-442T, *Future Combat Systems Challenges and Prospects for Success* (March 2005), at 10. See also, Renae Merle, *McCain, Auditors Question Army Modernization Effort.*, WASH. POST, May 17, 2005, at E2; Renae Merle, *Hearings Focus on \$100 Billion Army Plan*, WASH. POST, May 15, 2005, at E10.; Renae Merle, *McCain, Army Will Restructure Modernization Contract*, WASH. POST, April 6, 2005, at E2; Tom Bowman, *Army to Restructure \$20.9 Billion Contract for Future Combat System*, BALTIMORE SUN, April 6, 2005, 5A.

<sup>31</sup> See, e.g., <https://www.fcs.army.mil/>.

“Only 2 of the program’s 44 technologies are fully mature and 30 are nearing full maturity. ... All critical technologies may not be fully mature until the Army’s production decision in February 2013...” But – and this is a breath of fresh air – all parties involved concede the ultimate end product will not fulfill all of the Army’s aspirations. GAO explains that:

The Army’s FCS development cost estimate depends on a number of assumptions. *Historically, programs using such assumptions tend to underestimate costs.* Program officials stated they will not spend more in development than the current value of the FCS development contract. Any projected cost overruns would be eliminated by deleting requirements, forcing the user to forego certain capabilities.

Thus, FCS is a rare example where DOD concedes that it is a work in progress. Within the monetary constraints imposed, the Army will prioritize which projects to continue pursuing, and which to jettison. In other words, the FCS could be described as the Army’s funding vehicle for a broad range of pursuits of technological advances that the Army hopes to integrate into its fighting brigades. Rather than treat these individual pursuits – most of which lack the technological maturity to produce accurate cost and schedule projections – as unique programs, the Army has concatenated the initiatives into a massive enterprise.

CBO reports that “the costs from 2006 through 2020 to develop and purchase the first increment, which would equip 15 — or about one-third — of the active Army’s combat brigades, could approach \$90 billion.” This... would make FCS the largest and most expensive program in Army history. Others suggest that FCS research and development and procurement costs through 2022 could run as high as \$157 billion....<sup>32</sup>

All of which returns to the difficult question of how Congress can provide sufficient funds to modernize the Army so that it enjoys battlefield superiority and ensure that the funds are spent efficiently.

### **Aerial Refueling**

I offer this final anecdote to return the focus to the ultimate goal of major systems acquisition: providing the end user with the essential tools necessary to perform that individual’s or organization’s role in furtherance of the agency’s Congressionally-mandated mission. In that context, Congress should, first and foremost, judge the military agencies on their ability to work with finite budgets, prioritize amongst competing demands, and effectively field appropriate weapons (and support) systems.

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<sup>32</sup> Feickert, *Future Combat System (FCS)*, *supra*, nothing that: “Program delays could further add to total program costs, with GAO suggesting that a one year delay late in the FCS development cycle could cost over \$3 billion.”

The Air Force, dating at least back to 2001, articulated that the monumental task of replacing its aging in-flight refueling capacity<sup>33</sup> was one of its highest priorities. Yet, as of today, no progress has been made towards doing so. Rather, the program has provided a relentless cascade of bad news and embarrassment. The initial lease deal was ill-conceived, intentionally eschewed the benefits of market competition, and, ultimately, was derailed,<sup>34</sup> limping along until, with the prior presidential election looming, it was put to rest.<sup>35</sup> The tanker-lease deal's primary by-product was the scandal that rocked the defense acquisition community.<sup>36</sup>

The subsequent competition suggested an inability to manage a high-profile, high-stakes procurement consistent with procurement laws, regulations, and norms. The Air Force issued a Request for Proposals ("RFP") on January 30, 2007, then awarded a contract to Northrop Grumman on February 29, 2008. Boeing promptly protested the award, and, for a host of reasons, on June 18, 2008, the Government Accountability Office ("GAO") sustained Boeing's protest.<sup>37</sup> The Defense Department intervened in an attempt to accelerate a re-competition, but this, too, resulted in cancellation earlier this month. Defense Secretary Robert

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<sup>33</sup> The fleet of 480+ tankers ranges in age from 43 to more than 50 years of service. "The KC-135 Stratotanker provides the [Air Force's] core aerial refueling capability. ... The first aircraft flew in August 1956 and the initial production Stratotanker was delivered ... in June 1957. The last KC-135 was delivered to the Air Force in 1965." Air Force Link, <http://www.af.mil/factsheets/factsheet.asp?fsID=110>.

<sup>34</sup> In December 2001, "Congress approve[d] a defense bill allowing the Air Force to spend \$20 billion . . . to lease 100 modified 767 Boeing jetliners as refueling tankers." Andy Pasztor, Jonathan Karp & J. Lynn Lunsford, *Rumsfeld Stalls Air-Tanker Deal With Boeing as Criticism Builds*, WALL ST. J., May 26, 2004, at A3. The tanker fleet was meant to replace "a tanker fleet that dates from the Vietnam War." Douglas Jehl, *Air Force Pursued Boeing Deal Despite Concerns of Rumsfeld*, N.Y. TIMES, Dec. 6, 2003, at A1.

<sup>35</sup> Leslie Wayne, *Documents Show Extent of Lobbying by Boeing*, N.Y. TIMES, Sept. 3, 2003, at C1; Douglas Jehl, *Air Force Pursued Boeing Deal Despite Concerns of Rumsfeld*, N.Y. TIMES, Dec. 6, 2003, at A1; Leslie Wayne, *Boeing Must Compete for Tanker Contract*, N.Y. TIMES, Sept. 3, 2003, at C2; Andy Pasztor, Jonathan Karp & J. Lynn Lunsford, *Rumsfeld Stalls Air-Tanker Deal With Boeing as Criticism Builds*, WALL ST. J., May 26, 2004, at A3.

<sup>36</sup> The former principal deputy assistant Air Force secretary, Darlene Druyan, went to prison after admitting to engaging in the improper conduct that led to the contract being originally awarded to Boeing. Andy Pasztor & Jonathan Karp, *Career Crash: How an Air Force Official's Help for a Daughter Led to Disgrace*, WALL ST. J., Dec. 9, 2004, at A1. See also Defense Science Board, *Management Oversight in Acquisition Organizations* (March 2005), available at [http://www.acq.osd.mil/dsb/reports/2005-03-MOAO\\_Report\\_Final.pdf](http://www.acq.osd.mil/dsb/reports/2005-03-MOAO_Report_Final.pdf).

<sup>37</sup> The Boeing Company, B-311344, June 18, 2008 (Comp. Gen.); Press Release, Office of Comp.Gen. of the U.S., GAO Sustains Boeing Bid Protest (June 18, 2008), available at [http://www.gao.gov/press/press-boeing2008jun18\\_3.pdf](http://www.gao.gov/press/press-boeing2008jun18_3.pdf); Dana Hedgpeth & Robert O'Harrow Jr., *Air Force Faulted Over Handling of Tanker Deal*, WASH. POST, June 19, 2008, A1.

Gates bemoaned that: “we can no longer complete a competition that would be viewed as fair and objective in this highly charged environment[.]”<sup>38</sup>

Looking back over nearly seven years, the tanker lease/procurement saga has:

- cost private industry (and, ultimately, private shareholders) staggering sums in proposal preparation costs, plus legal, lobbying, and public relations fees;
- generated one of the most dramatic procurement scandals of the modern era;
- brought into question the fundamental competence of what, until recently, was perceived as one of the government’s leading procurement agencies;
- exposed the relentless protectionist pressures that hamper the procurement system;<sup>39</sup>
- diluted public confidence in the procurement system;
- proven extremely lucrative for the private bar, lobbying firms, and public relations and advertising firms; and
- achieved nothing in terms of meeting the warfighters’ needs for restoring the Air Force’s in-flight refueling capacity.

Obviously, room for improvement remains.

### **Conclusion**

That concludes my statement. Thank you for the opportunity to share these thoughts with you. I would be pleased to answer any questions.

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<sup>38</sup> August Cole & J. Lynn Lunsford, *Boeing Considers Bailing out of Tanker Bid*, WALL ST. J., Aug. 22, 2008, at B1; August Cole & J. Lynn Lunsford, *Boeing Gets Reprieve in Fuel-Tanker Contest*, WALL ST. J., Sept. 11, 2008, at B1.

<sup>39</sup> Defense Science Board Task Force on Defense Industrial Structure for Transformation, at 17. The Report notes existing isolationist and protectionist constraints: "Despite globalization, U.S. policy continues to not allow the nation to gain the security and economic benefits that could be realized; instead focusing on ‘Buy American;’ the Berry Amendment, obsolete International Traffic in Arms Regulations (ITAR) and export controls; and restrictions on foreign scholars, students and [science and technology] workers; all of which limit flexibility in acquisition options and cost savings."

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Outside of the U.S., he has advised hundreds of government officials on public procurement issues, either directly or through multi-government programs. His dispute resolution experience includes service as an arbitrator, mediator, neutral, and ombudsman. Professor Schooner received his Bachelors degree from Rice University, Juris Doctor from the College of William and Mary, and Master of Laws (with highest honors) from the George Washington University. He is a Fellow of the National Contract Management Association (NCMA), a Member of the Board of Advisors, a Certified Professional Contracts Manager (CPCM), and serves on the Board of Directors of the Procurement Round Table. He is a Faculty Advisor to the American Bar Association's PUBLIC CONTRACT LAW JOURNAL and a member of the GOVERNMENT CONTRACTOR Advisory Board. He is author or co-author of numerous publications including THE GOVERNMENT CONTRACTS REFERENCE BOOK: A COMPREHENSIVE GUIDE TO THE LANGUAGE OF PROCUREMENT (now in its third edition). Professor Schooner's recent scholarship is available through the Social Science Research Network at <http://ssrn.com/author=283370>.