

THE WEAPONS ACQUISITION PROCESS

THE IMPEDIMENTS TO RADICAL REFORM

Lauren Holland

Despite three and a half decades of studies and reforms, weapons cost too much, take too long to deploy, and do not perform as expected. Why is comprehensive change so elusive? In this article, two points of view—the incentive and the pragmatic arguments—will be examined more fully in an effort to answer the question of why the weapons procurement process has remained, and may continue to remain, impervious to radical change. But there are some solutions that may help reform measures better prevail over the forces hindering change.

Students of weapons procurement continue to view the process with concern, mostly for its failure to perform in an efficient, judicious, and timely fashion and for its inability to produce weapon systems that provide optimal solutions to military problems. Despite 35 years of acquisition studies and reform initiatives, the same problems persist: Weapons cost too much, take too long to deploy, and do not perform as expected (Holland, 1997b; GAO, 1992; Hampson, 1989). Why, despite a commitment by the President, the Pentagon, and Congress to acquisition reform, has comprehensive change been elusive?

A broad collection of measures to effect sweeping, even radical, changes in the weapons acquisition process has been adopted or considered. In the past, reform efforts have focused primarily (although

not exclusively) on streamlining the weapons acquisition process, improving cost-estimating practices, and changing personnel procedures to produce more qualified contracting staff. Recommendations have included eliminating needless legal encumbrances on contracting procedures; empowering program managers; establishing clear lines of authority; simplifying the source selection process; reducing technical criteria; recodifying federal laws governing procurement; employing more frequent product testing and competitive prototyping; improving the pay, training, and career options for personnel; and multiyear congressional funding.

More recently, radical changes have been suggested under the rubric of reengineering and reinvention that draw upon the new public management. In addition to recommendations for downsizing,

streamlining (“defatting”), and deregulating the Pentagon, advocates of this approach call for reinventing government with more competition, results-based budgeting, outputs evaluation, the elimination of functional specialization, process reengineering, decentralized decision making, information “capture” and some privatization (Thompson and Jones, 1994; Hammer, 1990).

Despite legislative and presidential enthusiasm for radically restructuring the weapons procurement process, implementation of this new category of reforms (like its predecessors) has been disappointing. Why have the changes in the body of laws, regulations, procedures and processes failed to reshape the practices of those responsible for military hardware acquisition and the products of that process, the instruments of war and peace; and what can we predict about the actualization of the recent body of radical reforms?

One group of scholars suggests that past and even current reforms, although appropriately focused, have been and will continue to be resisted by the individuals charged with implementation authority. The resistance, the reasoning continues, is because there are few incentives for key actors in Congress, the Pentagon, and the defense industry to alter conventional patterns of behavior (ones that have served their interests) to accommodate the institutional and structural changes that reforms require, particularly the radical

changes envisioned by the new public management.

A competing explanation argues instead that past and current reforms are unrealistic given certain institutional and political constraints, concentrating as they have on streamlining and deregulating the weapons acquisition process to make it more cost effective. Such reforms are inherently risky because they are incompatible with an American political system not designed to be efficient, and an American political culture committed to popular control, accountability, and equity.

In the discussion that follows, these two points of view will be examined more fully in an effort to answer why the weapons procurement process has remained, and may continue to remain, impervious to substantive change. While these two perspectives of acquisition are not exhaustive, they are compelling and provocative in their analyses. More specifically, the incentives and pragmatic arguments focus attention on the obstacles that frustrate the actualization of meaningful reform. While some of the obstacles (such as the incentives that drive behavior) are subject to modification, others (such as those attendant to the American political system) are not. This means that radical change can succeed only if it adjusts to certain political, strategic, and economic inflexibilities.

After a review of the forces that the incentive and pragmatic arguments identify as frustrating radical change in the

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Pentagon, the article concludes with some recommendations for accommodating reform measures to these forces.

THE INCENTIVE STRUCTURE

Recent assessments of the weapons acquisition process conclude that past and current reform efforts that alter or reengineer managerial, organizational, and procedural patterns ignore the incentive structure that fuels behavior (GAO, 1992; Fox, 1989-1990; Kovacic, 1990). In our political system, reforms must be implemented by groups of individuals who have a vested stake in the status quo of procurement.¹ Thus, the incentives to actualize these reforms are absent. This explains, for example, why key provisions of the Goldwater-Nichols Defense Reorganization Act of 1986 (which incorporated a number of the recommendations of the Packard Commission) have yet to be successfully put into effect despite more than a decade of effort. Even the centerpiece of the 1986 Act, the creation of a weapons procurement czar, provoked immediate resistance from the military services, resulting in Richard Godwin resigning after less than a year in office (Kovacic, 1990, pp. 84–85). During the same period, bureaucratic resistance compromised the operation of the Operational Testing and Evaluation Office, another key recommendation of the Act. A more recent example is the \$150 billion shortfall in the Department of Defense's (DoD) 1995–99 Future Years Defense Program. According to advocates of the incentive argument, this shortfall demonstrates the Pentagon's persistent proclivity for overestimating

budget support and underestimating procurement costs, despite a federal law prohibiting such behavior (GAO, 1992, p. 15). As further evidence, the Pentagon's Quadrennial Defense Review (QDR) (released in May 1997) is cited as an example of the military's reluctance to embrace radical changes in military strategy, force structure, procurement plans or operational concepts.

Although multiple examples of the military (and its suppliers and Congress) resisting change can be cited, the important question is what motivates or drives its pervasive reluctance to embrace seemingly important changes in the way America develops major weapon systems? In other words, what is the nature of the dynamic that compels key players to work at cross purposes with the very reforms they have publicly endorsed?

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In principle, the efforts to streamline and downsize the acquisition process, improve cost and schedule estimates, simplify procurement (especially contracting and financial reporting) practices, stabilize funding, encourage competition, limit concurrency, decentralize decision making, and secure better trained and paid program managers are popular measures. In practice, some of these reforms bring changes that threaten the organizational interests and stature of key players and agencies. The classic example is concurrency. While concurrency is important for

expediting the fielding of much needed military hardware, in cases of technological uncertainty, abbreviating the process can prevent errors being corrected before a weapon goes into production, causing costly modifications and delays. Despite support from public law, the Packard Commission, the Defense Management Review, DoD regulations, and at least one academic study² for more frequent use of a sequential management strategy (in cases of technological uncertainty), concurrency is still largely used, most recently in the development of the F-22 fighter plane. The reason is that concurrency works to the advantage of a military service by insulating a project from critical evaluation until a weapons system is in production. Since few weapons are

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canceled in production, this shields a preferred project from termination. There is no incentive, then, for the services to switch to a sequential management strategy,

despite the fact that many programs whose development depends upon major technological innovations need extensive prototype testing to ensure that the “bugs” are worked out before design and production decisions are finalized.

Similarly, there are few incentives for the services to produce accurate cost and performance estimates if doing so means losing a weapons system essential to their organizational stature and existence. As long as the services are rewarded for disingenuous behavior, then they will

continue to manipulate risk assessments, cost estimates, and prototype test results. Nor are the defense industry and Congress blameless. Defense companies will continue to bid low and propose designs that promise extraordinary performance capabilities as long as this behavior wins them contracts.

Members of Congress will continue to pass well-intended reform legislation to rationalize procurement practices such as the Federal Acquisition Streamlining Act of 1994 (FASA), then vote to continue programs the Pentagon opposes for cost-benefit reasons (such as the V-22 *Osprey* aircraft and SSN-21 *Seawolf* submarine programs) if there are electoral or financial benefits in doing so. William Kovacic (1990) suggests that Congress, despite its statutory commitment to make the acquisition process more cost-effective, operates in ways that compromise efficiency because of its concern for public accountability. Similarly, the Pentagon and its suppliers are publicly committed to streamlining the procurement process but privately opposed because over-regulation actually shields them from public scrutiny.

In short, actors in the drama of procurement are not reprimanded but rewarded for behavior that is adverse to the direction of much of the reform agenda (Biery, 1992, p. 641). Contractors who underbid to win a contract and then fail to reduce costs receive bail-outs and production contracts (e.g., Lockheed and the *Cheyenne* helicopter). A military service that manipulates test results is rewarded with continued support for its preferred weapons system (e.g., the Aegis air defense system). A program manager who completes a project that experiences massive cost overruns and schedule delays is promoted (e.g.,

the MX missile system). Few penalties are levied against defense contractors who employ excessive optimism (C-5A transport plane), and few rewards are given to program managers who reduce costs, highlight potential risks, and improve performance if these achievements incur schedule delays (Skipper missile). According to the GAO, the failure to reward the very behavior that supports the focus of reform efforts is tied to a political culture that focuses on completing a military project rather than improving the process.

The statutory means are now available to alter this dynamic. The FASA requires the Defense Secretary to make personnel decisions (pay and promotions) on the basis of whether program managers achieve the projected cost, schedule, and performance goals for each phase of the acquisition cycle. In addition, it requires the Pentagon to report to Congress on whether it is within 90 percent of its cost, schedule, and performance goals for military hardware. Once again, however, the success of these mandates is contingent upon a certain amount of good faith. Critically, political forces (such as the reexamination of the military's role in the post-Cold War period coupled with massive cuts in the defense budget) that threaten to diminish the organizational role and stature of the military services could provoke the sort of recalcitrance that blocked the successful implementation of previous reforms. With less money available to develop military hardware and a reduced role, the services are likely to revert to the standard operating procedures of pursuing gold-plated weapons and embracing a concurrent management strategy to protect their diminishing turf. Moreover, any reforms that reinvent processes,

and organizations in ways that alter incentives but initially threaten or eliminate jobs (such as downsizing, results-based budgeting or functional generalization) are likely to encounter "considerable bureaucratic resistance and organizational friction" (Thompson and Jones, 1994, p. 242). Similarly, any reform suggestions for increased privatization and competition, because they threaten the special relationship (monopsony) that the defense industry enjoys with DoD, are likely to be unpopular.

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A PRAGMATIC PERSPECTIVE

A competing explanation for the failure to achieve radical procurement reform asserts that the direction of past and current recommendations is contrary to certain political, economic, international and technological imperatives. Although appealing in principle, efforts to improve the efficiency of the procurement process are impractical in a democratic political system committed to accountability, popular control, and equity.³ In fact, many critics of current reform efforts are particularly offended by the condemnation of politics that is an implicit assumption of rationalism.⁴ Pragmatists note further that the drive toward efficiency ignores unforeseeable changes in the broader environment

that adversely affect military hardware development. In other words, forces not subject to control such as inflation, technological obsolescence, and international conflict can foil efforts to rationalize or reengineer weapons procurement (Mayer and Khademian, 1996; Chittick, 1988; Art, 1985; Gansler, 1989; Fox, 1988; Thompson, 1993; Haffa, 1988).

Where rationalist procurement reform pulls in the direction of attenuating the decision making process, the democratic imperative pulls in the direction of invigo-

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rating the process. In the American political system, the prevailing belief is that public decisions deserve to be made in a relatively open forum that allows for and credits input from mul-

multiple actors whose interests may be competing ones; to do otherwise is contrary to the conditions of a democracy. This is why congressional reforms mandating efficiency also strengthen the oversight component of the procurement process, even though the two forces pull in opposite directions. This also explains why Congress, despite being an impetus for the new public management, continues to be an obstacle to successful implementation of radical change because of its proclivity for legislative micromanagement (Thompson and Jones, 1994, p. 243).

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congressional (and by extension public) role in military matters. Moreover, oversight has proven to be an important corrective measure in a number of cases where congressional action has amended the weapons acquisition process.⁵ For example, legislative “interference” improved the performance capabilities of the M-1 tank and the M-16 rifle and brought out cases of malfeasance and questionable practices in the development of the Skipper (AGM-123A) missile, MX missile system, and F/A-18 (*Hornet*) fighter plane (Lindsay, 1991; Holland, 1997b).

Encouraged by an open political system, the public too has contributed productively to the military debate.⁶ Daniel J. Kaufman credits media coverage of and public concern over the Defense Department’s wasteful and fraudulent procurement practices (exemplified by the purchase of \$600 hammers) as contributing to the reform efforts in the Pentagon (1987). The media are also lauded for their coverage of the M-16 rifle, Aegis air defense system, and the division air defense gun (DIVAD) that led to, respectively, a review of the rifle program by a special subcommittee in the House Armed Services Committee (now House National Security Committee), investigative hearings in Congress and a mandate for new operational tests, and Secretary of Defense Caspar Weinberger’s decision to cancel the air defense gun.

The nuclear freeze movement is credited with influencing Reagan’s decisions to soften his “rhetoric” and pursue serious arms control negotiations. In both the MX missile and B-1 bomber cases, public involvement (motivated by economic, social, cultural, and environmental considerations) raised fundamental national

security issues. Now that the end of the Cold War has invalidated the strategic missions of the MX and B-1, it is interesting to ask whether one condemns or applauds the fact that public involvement was instrumental in delaying their deployment.

Defenders of accountability also point out that circumventing the democratic process does not guarantee better quality military hardware. Both the F-117A fighter plane and B-2 strategic bomber were classified programs, designated “black” systems because of the national security implications of their development. The F-117A is considered to be an excellent plane, whereas the B-2 has encountered a number of mechanical problems. Even the F-117A program, however, experienced schedule delays, cost overruns, and performance failures that postponed the plane’s readiness for several years (GAO, 1992), despite streamlined management and baselining.⁷ Similarly, the requirement that off-the-shelf components be purchased to expedite development resulted in the ill-fated DIVAD anti-aircraft gun that Weinberger canceled after the Army sunk \$1.5 billion into the program. Finally, the evidence that deregulation results in improved weapons procurement and military equipment is inconclusive (Thompson, 1992–93, p. 748).

A second claim by advocates of a pragmatic argument is that reform options that promote efficiency are naive given the vagaries (uncertainties) of the global environment, the American economic system, and technological development (Biery, 1992). While the complex web of rules, regulations, procedures, and organizations that characterize procurement in the U.S. have sought to bound these uncertainties

(examples include the milestone review process and the Cost Analysis Improvement Group [CAIG]), they can at best be imperfect measures. National security problems for which military solutions (including weapon systems) are developed are extremely complex and ambiguous, the information necessary to make informed decisions is inherently uncertain and difficult to obtain, and the decisions themselves are responses to estimated “enemy” threats and military capabilities predicted for some undetermined future point in history. No amount of reinvention or reengineering can fully account for these uncertainties.

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In addition, because policy making does not occur in a laboratory situation, other uncontrollable forces influence military hardware decisions. Examples are the inflation that compromised the “fly before you buy” acquisition method, labor disputes that stalled the construction and timely completion of the *Trident* submarine, political opposition in Utah and Nevada that doomed the deployment of the MX missile system, and technological challenges that plagued the development of the B-1 strategic bomber. The concept of total-package procurement (TPP) introduced by Defense Secretary Robert McNamara in 1964 is often cited to illustrate how technical and cost uncertainties that arise during the early stages of development and the fluctuations in the national economy can doom even well-intended reform efforts (McNaughton, 1989; Stubbing,

1986). Ironically, the two major acquisition reforms that the C-5A disaster spawned—the milestone process and the “fly before you buy” concept—have both been subsequently compromised by political, economic, and strategic forces. For example, the “fly before you buy” mandate contributed to the protracted 20-year development of the M-1 tank.

ACTUALIZING REFORM

Despite conscientious recommendations to improve the process that is used in America to build major weapon systems, successful implementation has been imperfect. Both the incentive and pragmatic arguments offer convincing explanations for the failure to actualize radical reform in the Pentagon, and, thus, proffer a cautionary note to advocates of the new public management. Neither argument suggests totally abandoning the current body of rules, regulations, and procedures.

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Taken together, the perspectives offer recommendations for accommodating efficiency, democracy, and the vagaries of the environment. The incentive argument promotes a viable system of reward and punishment to reinforce the direction of reform toward greater efficiency; that is, reward those who improve the process, not just the product, of procurement. Implicit in the pragmatic argument is the suggestion for a more flexible set of criteria for

evaluating performance to compliment a strengthened reward system while preserving the current network of checks and balances.

These new criteria, however, must account for the fact that efficiency and performance excellence are sometimes incompatible; the vagaries of the political and economic system cause weapons to experience cost overruns and schedule delays that may actually improve their performance capabilities; and objectives other than efficiency, such as political accountability and equity, are commendable. The difficult thing is how to preserve the existing body of reforms and continue the drive for efficiency without abandoning the commitment to accountability, popular control and equity.

Kenneth Mayer and Anne Khademian suggest shifting the system of recompense from an exclusive emphasis on output performance to a consideration of input performance. In other words, key actors would be remunerated for respecting the legislative oversight and military milestone processes. Thus, rewards would be granted not only to those who cut program costs and field a timely weapons system that performs as expected (results-based budgeting, outputs evaluation), but also those who produce realistic cost estimates and conduct fair prototype competitions as mandated by federal law, even if efficiency is compromised in some cases. To make this complicated system of rewards and penalties work requires more flexible evaluation criteria that recognize that definitive standards of output performance are impossible to achieve in a democracy, and that input and output performance are often incompatible (Mayer and Khademian, 1996; Korb, 1994). Recent

legislation (Federal Acquisition Reform Act of 1996 [FARA]) continues the pattern, however, of rewarding program managers primarily for achieving results.

As a preliminary effort, the focus of a reformed system of recompense should be on the military services, particularly the relationship between funding and organizational stature. The military services must be discouraged from promoting unnecessary, untested, and unworkable hardware because their organizational lives depend upon shares of the budget. Continuous initiatives to streamline and centralize the management of military programs to improve efficiency and realism fail to address this problem and, therefore, merely sustain the status quo. An example is the FASA, which reduces paperwork and some oversight provisions such as strict testing and auditing requirements, but otherwise leaves the incentive system in tact.

The challenge to those seeking to alter the motivations behind procurement is to discourage parochialism, optimism, and protectionism while continuing to profit from the expertise of the military services (and the defense industry) in acquisition matters. Meeting this challenge requires reducing the control that the military services have over mission needs, enforcing oversight, and securing adequate and stable funding from Congress.

According to the GAO, the authority for determining mission needs must be removed from the military services and placed elsewhere, such as with the Joint Requirements Oversight Council (JROC), the Defense Resources Board (DRB), or the Office of the Secretary of Defense (OSD), (GAO, 1992, p. 63). Thompson and Jones contend that the combatant commands are already recognized as the

“principal instruments” of defense policy, and should be allowed to operate as mission centers (1994, p. 223). In either case,

power would remain with the services to build the weapons system. For the GAO, an energized Defense Acquisition Board (DAB) would work to avoid gold-plating and other problems. For Thompson and Jones, accountability would

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result from the requirement that the services compete in the sale of their equipment to the combatant commands (1994, pp. 223–227).

Only Congress, however, can ensure funding stability. How, though, do we guarantee that funding decisions are made by members of Congress in a reflective way that avoid the pitfalls of parochialism? In other words, how do we contain oversight within manageable boundaries that lessen the intrusive nature of legislative involvement? Thompson and Jones suggest that Congress provide budget authority to the combatant commands rather than to the military departments, a reform that would challenge the disproportionate power of the services (1994, pp. 229–230). Another recommendation is to embrace the process employed by Congress to make military base-closing decisions. Under this model, the DoD would submit its set of recommendations for needed weapon systems to an independent review

commission (staffed by experts) created by Congress. The commission then would give its recommendations to the President, who would forward his proposals to Congress. Congress would have the final authority, but with the requirement that it accept or reject the entire list.⁸ The advantage of this process, which already has proven successful, is that it recognizes that some aspects of weapons procurement are too technical for deliberation in a public forum and retains the funding and oversight powers of Congress (and, thus, the public). It also neutralizes the disproportionate influence exerted by privileged actors, such as the defense industry and

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members holding key positions in Congress. The commission option would also encourage key players to view weapon systems as part of a

coherent force structure rather than as discrete entities, in concert with the principle of mission budgeting.

A related, albeit ambiguous, suggestion is to implement more comprehensive campaign reform. If one concern is with the perceived parochial tendencies of some members of Congress, then the solution is to eliminate one potential incentive for hypocritical voting: political action committee and campaign contributions. Campaign reform would also help balance the disproportionate influence of the defense industry and labor unions in the military debate by eliminating an important source of their power. By cutting the thread that connects the defense industry to members

of Congress, an important leg of the military subsystem would be neutralized. Nevertheless, campaign reform may not alter the cozy relationship between the military services and Congress that sometimes leads to weapon systems that have been canceled by the Secretary of Defense being restored by Congress (such as the Marine Corps' AV-8B Harrier and V-22 *Osprey* programs). The argument for campaign reform is ambiguous because empirical studies challenge the independent influence of political action committee and campaign contributions on legislative voting (Mayer, 1991). Nonetheless, any reform that liberates policy makers from indecorous forces has appeal.

To strengthen the oversight function of Congress, members need to be better informed. Those who condemn Congressional and public involvement as disruptive to the procurement process and distracting to defense experts cite the lack of knowledge and understanding of nonexperts. The logical solution to this argument would be to share more information, so legislative and public input is more substantive. This can be accomplished through statutory efforts such as the Freedom of Information Act of 1966 and greater use of public hearings by Congress and the Executive Branch (Holland, 1984). The Clinton administration's advocacy of the new public management, particularly information technology, could improve information transfer between the branches.

Advocates of oversight point to the important roles played by the legislative branch and the public in controversies such as the C-5A transport plane, M-16 rifle, B-1 bomber, DIVAD automated anti-aircraft gun, M-1 tank, and the MX

missile controversies. In the case of the M-1 tank, for example, preliminary errors of judgment made in the Pentagon were corrected in response to legislative concerns, resulting in the continuous improvement of the main battle tank. Increased oversight also could provide a basis for more aggressive enforcement of already existing criminal and civil codes to punish fraud, waste, and abuse in procurement matters, and hopefully, provide the requisite disincentives to disingenuous behavior. As a normative suggestion, Congress should refocus its energies from making weapons procurement decisions (which it is ill-equipped to do) to executing the sort of oversight that guards against fiscal, technical, and managerial malfeasance.

In order to retain a public role in military matters, Robert Dahl advocates an “extended adversarial process” in which the government’s task, during the initial stages of weapons decisions, is to clarify the debate and reduce important issues to two opposing policies, one supported by the administration and the other defended by an opposition (1985). The public, then, is confronted with a narrowly construed choice, but a choice that defines the boundaries of permissible government action and lends legitimacy to policy decisions. For Dahl, the electoral process is the best forum for people to register an opinion on policy choices. However, opportunities exist for public response to governmental dilemmas even when there is not an election at stake, through public opinion polling techniques. In order for this process to work effectively, the government must make as much information available as possible.

A second obstacle to the actualization of reforms is the effect of the competing

military, private and legislative interests served by weapons procurement. The direction of current reform is toward minimizing conflict by streamlining the process at the expense of a public and legislative role. The

danger is that accountability is reduced to the point where the benefits of political debate are nullified. More important, in cases

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where conflict remains unresolved, as it has over such fundamental matters as what constitutes a threat to America’s security and how to respond to these threats, forging a political consensus might be the only way to establish program legitimacy. Citizens are more likely to view the resources committed to weapons procurement as credible if they feel their opinions have been considered. When citizens rail against the biases in what is perceived to be a system controlled by military subsystems,⁹ their discontent is with the absence of sufficient countervailing measures.

A third obstacle to actualizing reforms are the vagaries of the political and economic systems and the military hardware process itself. Well-intended reforms to improve procurement must adjust to unexpected changes in technological development, the economy, and the global strategic environment. As noted earlier, current and past reform efforts have sought to bound these uncertainties in layers of processes and regulations. However, no amount of streamlined authority can compensate for the difficulties of making 5- to 15-year projections (the life cycle of an

average weapons system) about unknown features of the strategic environment. In that period of time, threats change, technology evolves, and political careers fluctuate. How, then, can we further reduce the adverse effects of uncertainty on weapons procurement?

One obvious solution, demonstrated in the academic literature, is to invest in less technologically ambitious weapons. In a recent study, the author found that technologically ambitious weapons are more likely to encounter performance problems,

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schedule delays, and cost overruns.¹⁰ In contrast, in all of the cases examined in the study in which the technical requirements were modest ones, the systems

performed as expected. Of particular prescriptive significance is the finding that moderate technological challenges are less likely to result in weapons with performance problems. The budget deficit in combination with improvements in Russian-American relations and accompanying arms agreements (Strategic Arms Reduction Talks [START], Intermediate Nuclear Forces Treaty [INF], etc.) suggest a reconsideration of the current force structure away from overly ambitious (or highly risky) technology. Weapons posing moderate technological challenges (such as upgrades) are still technically sophisticated enough to sustain scientific progress.

According to Martin Binkin, procuring less technically demanding hardware can

be accomplished by eliminating subsystems and requirements that are not essential to the mission (1986). Computer and cyber-technology can be directed more broadly to improving existing military hardware rather than to inventing new weapons. Because the technical challenges raised by retrofit development are less compelling than those posed by new scientific discoveries, both the uncertainties and costs that accompany advanced technology can be reduced. Advocates of moderate technology point to the success of the Air Force's F-16 fighter plane, which was developed under a flexible but moderate (not ambitious) set of performance requirements. It is important to keep these findings in mind, coming as they do at a time when the United States is said to be poised on the brink of a military-technical revolution.

What about the vagaries of the economic and strategic environments? To address economic uncertainties, Thomas McNaugher suggests a system of extended competition beyond the earliest stages of the procurement process, which means including the engineering and manufacturing (formerly full-scale development) and production phases (1989). Extended competition would require longer lead times, additional short-term funds, the elimination of sole-source contracts following prototype competitions, and the delay of contract awards until engineering and manufacturing, operational testing, and early production have been completed. Congress already has legislated some of these changes in the Defense Procurement Improvement Act of 1985 and Title IX of The 1986 Defense Authorization Act .

Extended competition, in addition to increasing the opportunities for a specific

weapon's development to adjust to technical uncertainties before design and production decisions are crystallized, would also discourage those who employ optimism, deceit, and parochialism as tools to promote their preferences (the buy-in phenomenon). Without a guarantee that an research and development contract will lead to a production contract, or that a Milestone I decision will automatically lead to Milestone II and Milestone III approval, there would be more of an incentive for privileged actors to continue to be diligent and conscientious.

Advocates also contend that extended competition would encourage innovation and creativity. The Air-Launched Cruise Missile (ALCM) program is cited as an example of a program whose success can be partially attributed to extended competition throughout the pilot production stage. Competition also saved the Skipper air-to-surface missile despite an organized effort by Texas Instruments, then-Senate Armed Services Committee (SASC) Chair John Tower, and the Air Force to build the sleek, complex, and expensive Triple L. Here again, the suggestions for extended competition run contrary to the most recent congressional reforms that continue to focus on reducing competition to advance efficiency (The FARA and The Information Technology Management Reform Act of 1996 [ITMRA]).

Adjusting to strategic uncertainties poses the most formidable obstacle to the management of radical reform. The only option is to build enough flexibility into the procurement process that a weapon's development can adapt to changes in the global environment. Recommendations for functional generalization, decentral-

ized decision making, and increased competition address this challenge in part. Moreover, in the absence of an imminent Soviet threat, weapons decisions can be comfortably made in a less hectic manner.

CONCLUSION

The purpose of the weapons acquisition process is to produce the systems that the United States can use to protect its vital national interests. A persistent mismatch between military needs and capabilities during the Cold War precipitated decades of reform efforts to improve both the procurement process and the outputs of that process, major weapon systems. The resulting recommendations have failed to be fully implemented, despite diligent efforts. The explanations for the failure to sufficiently realize procurement reform point to the prevailing incentive structure in which key players operate, the disruptive effects of uncontrollable forces in the global and domestic environments, and the incompatibility between the direction of reform (efficiency) and certain democratic imperatives (accountability).

Overcoming the obstacles to the effective implementation of existing reforms and accommodating the drive for efficiency and accountability require a more flexible system of reward and punishment; vigorous oversight; a redefined role for Congress, the public and the military services; a commitment to invest in less risky technology; and an extension of the procurement process. Otherwise, current efforts to reengineer the Pentagon to improve America's military capabilities will continue to be frustrated.

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ENDNOTES

1. The Office of the Secretary of Defense (OSD), responding to the General Accounting Office (GAO) indictment, asserts that acquisition problems can be attributed “to a lack of discipline and to the pressures of the Cold War” (GAO, 1995, p. 13). With the Cold War over, the Pentagon need only execute changes in discipline.
2. Michael Brown, in a study of manned strategic bombers, found that concurrency has the most viability in cases where the technology demanded by the weapon is modest or moderate in nature. The appropriate strategy in cases of sophisticated technology is a sequential one (1992).
3. The commitment to the principle of equity sustains the concessions to small businesses and women- and minority-owned firms in contracting decisions, despite the additional costs that are sometimes incurred.
4. Typical of the rational argument is Thomas McNaugher, who asserts that “reform must seek to remove political incentives from an elaborate technical process whose proper workings they can only disrupt” (1989, p. 182). What this attitude ignores is the creative impetus that politics can provide to procurement innovation. In his book on weapons innovation in the Soviet Union and United States, Matthew Evangelista credits American ingenuity in military matters largely to the open, porous and informal structure of the national security system (1988). In this sense, then, politics is a counterweight to narrowness and bias in decision making, which can result when the scope of participation is so narrowly construed that weapons development reflects the opinions or views of a small group of same-thinking experts.
5. For institutional and political reasons, Congress seldom places itself in an adversarial position on weapons procurement matters. More often, members of Congress seem content to tinker on the margins of military hardware matters, with some important exceptions. However, it is the exceptions that have fueled efforts to insulate the Pentagon from these “disturbing” outside forces.
6. With the exception of the mass media and special interest groups, the role of the public has been a marginal one in military hardware decisions. For the most part, the public lacks the interest and means to play an important role in weapons decisions. Notable exceptions are the MX missile, B-1 bomber, Trident submarine, and M-16 rifle programs. Moreover, since a public role is not a formal part of the defense policy-making process, its effectiveness depends upon the willingness of decision makers to translate public preference into government action. Even special interest groups, which exert the most immediate, direct, and significant impact on policy

- making in the United States, lack formal policy authority and must rely upon intermediaries.
7. According to the GAO (1992), baselining is the practice “whereby a program office ‘contracts’ with top management to develop a system that meets basic performance, cost, and schedule requirements in exchange for stable funding and minimal interference.”
 8. The Center for Strategic and International Studies has suggested an additional mechanism, a General Advisory Board on Defense Acquisition, which would monitor and report annually on whether progress is being made in implementing existing reforms.
 9. A military subsystem describes a reciprocal policy making dynamic involving the military services in the Pentagon, defense contractors, and the Congressional Armed Services Committees and Appropriations Subcommittees, all guided by personal and organizational concerns. (See Holland, 1997a.)
 10. The data focus on the association between technologically ambitious weapons and flawed ones. Each of the nineteen cases in the study was classified by the amount of challenge demanded by its technical requirements. Ambitious programs were those that challenged scientists and technicians to discover new principles or applications. Moderate programs generally involved the less demanding challenge of combining familiar principles or applications in new and complex ways. Demands were modest when scientists were required merely to apply and build upon known principles. Technological sophistication was then correlated with the performance status of each system. Performance status refers to whether a weapon met its performance goals at its initial operational capacity (IOC) date (Holland, 1997b).

