

**Statement of Gene H. Porter**  
**to the**  
**Subcommittee on AirLand**  
**of the**  
**Senate Armed Services Committee**  
**November 15, 2005**

Mr. Chairman, I welcome this opportunity to present my views on the management of defense acquisition programs to this Subcommittee.

I am currently a research analyst at the Institute for Defense Analyses (IDA), a federally funded research and development center that is chartered to provide objective analyses primarily to the Office of the Secretary of Defense and the Joint Staff. I have attached a brief overview of IDA to this statement. At this Subcommittee's March 2005 hearing on the Army's Future Combat Systems (FCS) program, the Chairman said, "The Institute for Defense Analyses should look at the entire procurement issue. As it turns out, I am currently involved in a similar project. This ongoing effort, plus my personal experience, forms the basis for my statement. My industry and government background on these matters is briefly and informally summarized in an attachment.

Although I will refer to the results of some IDA research, this statement and my responses to any subsequent questions are mine alone.

My statement deals primarily with the deliberate long-term planning and execution of major weapons systems acquisition programs. It does not address the obvious need for effective emergency procedures for meeting unexpected near-term needs of forces in combat—procedures that the Congress and executive branch have recently dealt with in some detail.

Having been involved in several high-level reviews of defense acquisition management in recent years, I remain a strong supporter of the findings and recommendations of President Reagan's Blue Ribbon Commission on Defense, commonly referred to as the "Packard Commission." Some of the Packard recommendations were never fully implemented. Others were implemented in DoD

policies and procedures but not always followed in practice, as Senator Levin observed at the hearing of the full Committee on September 27. My view of the major weaknesses in implementation are summarized below and described in more detail throughout this statement.

I find only two major elements missing from the earlier Packard recommendations: (1) the widely recognized need to improve policies and procedures that encourage more and better joint acquisition, for which no formal acquisition management structure currently exists, and (2) “milestone budgeting,” which I deem to be less urgent but still worth pursuing.

In my view, the current major problems with the Department’s management of the acquisition portfolio can be usefully categorized into the five areas outlined below. The relative importance of each of these problems varies widely among the military Services.

1. Weak integration of the Department’s weapons system requirements process, the formal acquisition management process, and the programming/budgeting process.
2. Excessive departures from proven systems engineering management practices already embedded in policy, sometimes summarized as “Fly-Before-Buy.”
3. Frequent—indeed chronic—changes in the actual funding provided to programs compared with the initially approved funding profiles.
4. Lack of progress toward Joint Acquisition, as exemplified by the lack of a formal DoD management structure, except at the Special Operations Command (SOCOM) and at the Defense Agencies.
5. The shift in the locus of scientific and technical advances that are likely to be important in the future to outside the primary purview of the Defense Department and in some cases outside of the United States.

I believe these problems underlie many, if not all, of the issues about which the Subcommittee asked the witnesses to comment, including the reported excess growth in the cost of too many programs. Unfortunately, there is no single solution that I can recommend that would make progress on all fronts.

As this Committee well knows, improvement of defense- indeed government – acquisition is a complex topic, and significant progress will be a long, hard slog. I will

highlight some aspects of each of the foregoing five topics and then close by addressing your questions about the industrial base, outsourcing, and competition. For lack of time and relevant expertise, I will not address in any detail other important acquisition management issues of potential interest to this Subcommittee, and to the full Committee, such as services contracting and accountability other than to note that in his testimony on September 27<sup>th</sup>, Secretary Kreig cited better accountability as one of the three key principles he intends to pursue. This is a complex area that extends from the difficulty of holding accountable program managers that have insufficient control of their own funding, to the accountability of higher level officials.

## **REQUIREMENTS-RELATED ISSUES**

This section deals with better integrating the requirements aspects of defense acquisition. The problems with acquisition-budgeting integration are dealt with in a subsequent section.

A key step in sound acquisition program planning is to establish realistic, achievable, and affordable statements of the intended principal characteristics of a notional new weapon system. There is an ongoing tendency in some quarters to consider the establishment of such “requirements” as quite separate from the acquisition process. That is not what the Packard Commission recommended, nor is it consistent with the legislation that established the position of the Undersecretary for Acquisition, as I understand it. At the end of the day, the Undersecretary of Defense for Acquisition, Technology and Logistics, acting on behalf of the Secretary has the responsibility and authority to decide the equipment characteristics the Department will ask the President to request that the Congress fund.

Nevertheless, it is highly appropriate that the nation's warfighting experts, both the Combatant Commanders, and the Chiefs of the Military Services, be deeply involved in the decisions that lead to establishing a formal acquisition program. Indeed, the Service Chiefs in particular are in fact heavily involved, not only in identifying needs and setting the requirements at the start of programs, but also in the ongoing cost-performance trades that are made as a program proceeds through development and into production.

In addition, the Chairman of the Joint Chief's of Staff has established a formal process by which his staff develops advice that is provided to the Defense Acquisition Executive (DAE) as to what the Department should acquire to meet a recognized need – particularly from the viewpoint of the Combatant Commanders and the joint warfighting community. The DAE ultimately makes such decisions in consideration of the advice rendered by the members of the Defense Acquisition Board, and ideally after examining the results of an objective Analysis of Alternatives. For this process to work well, there needs to be close cooperation between the warfighting “customers” and the acquisition executive, as was envisioned by the Packard Commission's unimplemented recommendation for the establishment of a Joint Requirement's Management Board (JRMB).

### **Inadequate Integration of Requirements into the Acquisition Process**

The objective formulation of requirements for new weapons systems has sometimes—some would say frequently—been hindered by pressure from the sponsoring Service—and its supporters—for a particular programmatic solution. As a result, DAEs have sometimes been presented with essentially a *fait accompli*, wherein both the need and the solution have been decided outside the acquisition chain, without a sound analysis of alternatives, and presented to the Defense Acquisition Board as a contract ready for issuance.

I was encouraged to read Secretary Krieg's testimony of September 27 in which he reported that he, too, believes the Department's requirements and acquisition processes must be better integrated, and laid out his principles for achieving that end. It is my understanding that he has moved to take a greater role in the examination of requirements, not only for major defense acquisition programs (MDAPs) but also for those other programs that may not meet the MDAP cost thresholds, but that are vital enablers to future joint military operations, such as command and control systems.

### **Inadequate Latitude for Cost-Performance Tradeoffs**

In addition to the sometimes lack of “due process” in establishing the analytic basis for a new acquisition program, once a new program is started, the detailed performance requirements and other characteristics are sometimes still specified in such detail that the program manager (PM) has little room for making the sort of cost-

performance trades for which, most agree, the PM needs both authority and latitude to decide if costs are to be adequately controlled. In my experience the degree of such cost-performance flexibility provided to the F-35 Joint Strike Fighter program managers is a rarity.

Secretary Kreig and two of the Service Acquisition Executives testified 2 weeks ago that they, along with their military counterparts, the VCJCS, and the Service Chiefs, are increasingly involved in making such cost performance trades on ongoing major programs. As a result, some performance goals are being significantly altered in order to better balance cost and performance risks. As noted earlier, such activities by the civilian acquisition executives were an important element of the Packard Commission recommendations. However, it seems likely to take some time before these increasingly routine management actions at very senior levels get translated in kind to the management of cost-performance trades on smaller programs.

Requirements that have been dictated in minute detail, without a full appreciation for the upcoming technical challenges, are a contributing cause of the dramatic rise in cost on some programs as cited by the Subcommittee's invitation letter. Indeed, much of this apparent rise in cost may be due more to a poor understanding of the technical risks at the outset (and premature commitment to the next phase) than to weak program management, as will be discussed in the next section of this statement.

By the same token, the pejorative term "requirements creep" doesn't always imply poor management. Indeed, in most major programs that are expected to take over a decade to proceed through risk reduction, system design and development, and initial production, the government should be open to changes that may add cost, if that added cost can be justified and funded without undue risk to other capabilities. Such changes include revised responses to changing threats, the unplanned availability of new technology that can lower production costs, and engineering changes that lead to worthwhile reductions in operating and maintenance costs. Many such changes are clearly in the Department's interest, but they should be made in a manner that demonstrates their appropriateness via the appropriate acquisition executive's requirements review process, and they should be clearly explained as prudent to the Congress, including their impact on other programs.

In keeping with this concept, a 2004 IDA study on the reported growth of costs of 138 defense programs attempted to differentiate between growth due to "decisions"

such as changing performance requirements or changing production rates, and growth due to “mistakes”, such as erroneous estimates of labor hours or material costs. IDA found that about half of the cost growth in development programs and one-third of the (smaller) growth in production programs was due to deliberate “decisions”, rather than “mistakes”

## **DEPARTURE FROM PROVEN SYSTEMS ENGINEERING PRACTICES**

A major thread of the Packard Commission’s recommendations was to “fly before buy.” Secretary Kreig now calls it “try before buy.” One could also say, “do it right the first time.” However it is stated, this old chestnut remains as valid today as it was almost 20 years ago. In fact, one could argue that it is even more valid today because there is no major new threat so imminent that sound system engineering management practices need to be sacrificed in order to accelerate the fielding of unproven technology and equipment. Although the precept is embedded in DoD policies, I sense that it has been insufficiently unheeded in recent years.

The Department has relied heavily on two key tools that are intended to implement this principle: One is working well; the other isn’t.

***Formal Operational Testing.*** Significant benefits have accrued to our warfighters by independently ensuring that their equipment has demonstrated both operational effectiveness and supportability in the field. US military equipment is the envy of the world’s fighting forces, in my view in large part as a result of our rigorous and independent testing.

***Technical Readiness Assessments( TRAs).*** As the Congress recognized when it passed Section 804 of the National Defense Authorization Act of Fiscal Year 2002, and as the GAO noted in its recent reports, the Department and its component Services have too often departed from well-established rules that require all elements of technology to have been demonstrated in the relevant environment before acquisition programs are allowed to proceed into full scale development. Premature ramping up of programs poses a high risk of problems that then require program activities to be recycled at great expense in time and money. The Army’s FCS program is an example well known to this Subcommittee.

More generally, the ability of DoD to independently and competently assess the maturity of technology is hobbled by the lack of in-house technical expertise. One reason that operational testing is so successful is the independence and technical competence of the Department's operational test and evaluation staff. A similar model could be developed and required for identifying critical technologies and assessing their maturity. This would better assure that the Milestone Decision Authorities and the Congress would have reliable information at key decision points. This would of course require a greater degree of government technical expertise than now exists – a need that is broadly recognized.

The 2004 IDA review of the Army's FCS program noted a large number of technical issues that had not been resolved at the time approval was given to proceed into system design and development. One result of these unresolved technical issues appears to have been the slippage of the Preliminary Design Review until late next year and overall slippage of initial operational capability by 4 years. These changes call into question the appropriateness of the Milestone B decision in 2003.

Given the lack of threat-driven urgency for the Department's major acquisition programs, I personally believe that there should be a very high bar for waivers of this sound management principle. This Subcommittee may wish to sponsor extension of some (possibly expanded) version of the existing reporting requirement under Section 804 beyond its scheduled expiration in 2006. I suggest that such future reporting include major information systems, retrospective reports on the accuracy of prior year's assessments, and on the degree to which previously approved risk mitigation plans succeeded. Such assessments need to be made by technically qualified personnel that are free of conflicts of interest. Service Acquisition executives could logically be required to report to the DAE similar information on the development programs under their purview.

## **FUNDING INSTABILITY**

As the members of this Subcommittee are well aware, the Department has accumulated an elaborate set of procedures for the detailed planning and management of acquisition programs – procedures that, when followed, and when accompanied by stable funding, have generally produced good results, given the complexity of DoD programs. The resulting “baseline” plans are tightly coupled to the timely allocation of the planned funding. Therefore, any significant change to the postulated funding profile—almost

always a reduction—is quite disruptive to even the best-planned and most technically stable program.

There are myriad reasons why the funding levels actually appropriated and apportioned to acquisition programs are frequently changed from those originally planned and agreed to within DoD. Some major contributors are as follows.

### **The migration of planned acquisition funds to the operating accounts**

The mismatch between the Department’s ability to carefully forecast the funds needed in the future for each approved weapon system and the Department’s ability (or willingness) to forecast its needs for future operating funds is an important contributor to instability. Given that DoD must always constrain its *total* funding plans to the level prescribed by the long-range budget plans of the President and Congress, every year the Department is faced with the need to cut back on previously planned acquisition spending in order to meet unplanned needs for operating and maintenance (O&M) funds. This ongoing problem is frequently exacerbated by having to adjust previously overly optimistic estimates of future total DoD funding levels to accommodate emerging near-term government-wide funding realities.

This source of instability in acquisition program funding is chronic—not just associated with either the current high tempo of unplanned operations or with deficit concerns. The acquisition program “cuts” imposed as a result of this phenomenon are usually broadly spread across most acquisition programs, requiring that most be re-planned in detail and at considerable increase in total cost. And this type of instability is not confined to actions in the executive branch across the 5-year plan. In some former years the Congress would level a “tax” on DoD in the form of an undistributed reduction for the imminent budget year that would have the same broad destabilizing effect. Indeed, I understand that fresh consideration is unfortunately being given to such a destabilizing “tax” for the current budget year as a way to limit the deficit.

Because this impact results from purely budgetary considerations and not from changes in the threat, or program troubles, or other changes in a particular program, it is difficult to argue within DoD that any particular program, or set of programs, should be sacrificed in order to protect the stability of the remainder, although such vertical cuts would be sensible.

A broad solution to this problem of annual transfers of previously planned acquisition funds to operating accounts would of course be for the Department to plan its long-term operations and maintenance spending to the same “most likely cost” criteria that it tries to apply to the planned cost of its weapons systems. For this reason, it is important that acquisition program planning be more closely coordinated with the Department’s overall resource allocation and budgeting processes. The latter is particularly challenging in that decisions on acquisition programs are largely *event driven* – completion of development, etc. – and budgets are *calendar driven*. Nevertheless, it is a hopeful sign that Secretary Krieg continues to emphasize the need to better integrate acquisition and resource management in his recent testimony.

### **“Fencing” is not the solution**

From time to time the suggestion is made that, once an acquisition program has been thoroughly reviewed and approved by the Defense Acquisition Executive, the associated funding profile that would lead to the next major milestone should be exempted from further adjustments, such as those frequently made during the annual budget preparation cycles. As important as improved funding stability is to the coherence and efficiency of acquisition program management, it is not more important than the need for the Department to be able to respond flexibly to changing threats, risks, and total funding availability as it prepares budget proposals. “Fencing” the funding for some acquisition programs would have the effect of further destabilizing others, under current procedures. For this reason, except for occasional isolated programs of great strategic importance, Secretaries of Defense have been properly reluctant, in my judgement, to mandate that specific levels of funding be earmarked for specific acquisition programs as the Services update their long range plans in response to his guidance.

### **The need for planned “reserves”**

The lack of DoD “Management Reserves” is frequently cited as a source of program instability. Managers of civil projects ranging in complexity from building a single family home to tunneling under a major city know they cannot accurately predict the total cost just by adding up costs of each of the initially planned steps known to be needed. There are always unknowns, and even unknown unknowns, that drive up the final cost. Builders that promise a result at a fixed price always include some unallocated contingency reserves in their bids, or they would soon be bankrupt.

In sharp contrast to private sector practice, the half of the DoD acquisition spending that is devoted to RDT&E, and most of the other half that goes to procurement spending, is contracted not on a fixed-price basis, but using cost-type contracts. In principle, the Department could – and should – include prudent contingency reserves in their estimates of both development and procurement costs. In practice however, there is a bias against such prudent planning in large part because there is always some need that is more tangible than the “unknowns” that motivate planning for reserves.

As the Subcommittee is aware, the Department has long supported an independent Cost Analysis Improvement Group (CAIG) dedicated to improving its estimates of future costs. This activity has been moderately successful, in my view, in strengthening the Department’s ability to forecast, and budget for, future production costs. Because of the uniqueness of every development program, and the sparsity of analytic tools, independent estimates of development costs have proved somewhat less reliable than those for production costs. These uncertainties lead to a tendency with the Department to, on average, accept rosy forecasts of development costs. Therefore, when a particular program develops a serious problem in development that raises its cost well beyond the budget, presuming the program is still important, the usual practice is to transfer funding from other acquisition programs to, in principle, “equalize the pain”. It may do that, but as with annual “taxes” by either the Congress or the Executive, the result is broadly destabilizing across many programs.

This of course is not a new issue. In past years the Department has tried several different approaches to establishing prudent levels of reserves, at least in its outyear plans, that can be allocated as needed to salvage troubled programs, or accommodate other sensible changes, without having to tax and destabilize others. In all cases, such schemes seem to have been abandoned after only a few years, or even months, because of the difficulty in holding back funds—even outyear funds—against unknown eventualities, when there were so many competing demands to meet known needs.

My personal sense is that the stability of acquisition programs is important enough to warrant yet another try at establishing such a reserves program – not necessarily for the budget year, but surely for the outyear plan. Whether such reserves should be held at the Program Executive Officer (PEO), Service Acquisition Executive (SAE,) or Defense Acquisition Executive (DAE) level is currently beyond my ken.

## **Other Funding Destabilizers**

### **The Appropriation Process**

DoD acquisition budgets are prepared years in advance of the actual intended dates of obligation of the requested funds. As time passes, more and more is known about the status of each ongoing program and its actual need for, and ability to effectively use, the requested funding. The executive branch updates its annual budget requests for the latest “fact of life” changes just before submitting the requests in February, and even occasionally submits amendments that have similar features. Nevertheless, it is the Congress that usually has the latest information on program status when the markups of appropriation bills near completion. It is not unusual to find that millions of dollars requested months earlier by the executive branch are no longer needed due to program slippages and are thus available to the Congress for reallocation.

One problem with this seemingly logical process is that there is no easy way for programs that have lost money in one year’s appropriation process to get it restored early in the next year. In cases where the entire program has slipped to the right by the amount of the reduction by virtue of its internal problems, this is not a major source of instability. However, in cases where Congress makes a marked reduction in funding because a major funding milestone has slipped a few weeks into the next fiscal year, that program will likely need most of that funding early in the following year, if disruptions are to be minimized. If DoD is to find the funds needed to keep the program on its slightly slipped track, it most likely will have to do so at the expense of the stability of several other programs. I have never seen the data that would be needed to accurately scope the full extent of this “congressional” instability, and therefore can’t judge the need for procedural changes.

### **Emerging, unplanned, programs**

An additional source of instability is a decision to move a promising experimental program that had not been planned for production into the formal acquisition system. The Department funds a variety of promising experiments that each have some prospect of becoming worthy of longer-term funding than originally planned. Such programs are typically managed by DARPA or in the Department’s Advanced Concept Technology Demonstrator (ACTD) portfolio. If one or more such programs are tested and found to warrant prompt inclusion in the Department’s long-term program plans, they usually

must displace one or more other programs—a destabilizing activity that has a chilling effect on the mainstream defense acquisition community’s enthusiasm for such programs. One obvious solution to this threat would be for the Department to create a standing outyear “wedge” of unallocated funds, some of which could be shifted annually to fund emerging good ideas without disrupting other programs. A problem with this approach is similar to that for establishing an outyear reserve for funding troubled programs and other program changes—there would be a significant one-time destabilization of other programs in order to fund such contingency accounts.

**One other potential improvement in program stability: Milestone Budgeting.**

A different step towards stabilizing the funding for the development/initial production phase of programs would be to shift to “milestone budgeting” as recommended by the Packard Commission. Under this approach the full estimated cost of development, and perhaps the first year or two of initial production, would be appropriated and managed as a lump sum in much the same way as the cost of a new lead ship used to be appropriated. A full-scale change to such a procedure would have a major impact only on obligational authority, but not on actual outlay rates, as the funds would be actually expended at approximately the previously planned rate. The benefit would be the greatly increased ability of program managers to efficiently plan and execute the multiyear activities of their development programs due to the confidence they would have in the availability of funds.

**Towards more accurate pricing of defense acquisition programs**

Some seem to believe that the Department still deliberately underprices many of its acquisition programs in order to be able to get as many new programs started as possible. Examples of such “low-balling” can undoubtedly be found, but my general experience in recent years has been that both the Services and OSD leadership have worked rather hard to budget their acquisition programs to the “most likely” cost, at least in the first year after such estimates are made.

Based on the IDA’s 2004 examination of data on 138 programs mentioned earlier, it appears that the decades-long effort to align DoD acquisition procurement budgets with the results of truly independent cost estimates has been modestly successful in reducing apparent production cost overruns. That analysis showed that about 75% of the cost growth in production programs was attributable to only 20% of the programs – outliers

beyond the expected normal distribution of estimate errors. I suspect, but can not demonstrate, that many of these outliers are attributable to both the aforementioned technological immaturity at the time the initial cost estimates were made, as well as some “requirements creep” that may not have received sufficient oversight.

## **LACK OF JOINT PROGRAM AND ACQUISITION PLANNING**

The impediments to jointness in the Department of Defense acquisition program planning are particularly well known to this Subcommittee, dealing as it does with the interface between the air and ground combat forces of the US. The Goldwater-Nichols Act is widely acknowledged to have led to significant improvements in the planning and execution of joint military operations. Its impact on increasing the “jointness” of the Department’s long-range program planning process, including its acquisition program planning, has been much less impressive to date.

It may be overly simplistic to contrast the apparent internal jointness between the air and ground elements of the US Marine Corps, with the ongoing difficulties in achieving similar synergies between the Army and the Air Force, but there are two important points that can be illustrated using that analogy.

### **Joint Operating Concepts**

First, a common, unified concept of how to operate together not only really helps, but is essential to real jointness. The Marines pride themselves on having hashed out effective operational concepts for air-ground operations across a broad range of combat scenarios. The unity of such concepts is widely advertised as integral to their “MAGTF” organizational structures. However, joint operating concepts and joint integrating concepts that cross the boundaries of the other Services are much less developed.

It is difficult to make a lot of progress in defining an acceptable set of joint “requirements” for new equipment that would be operated by multiple Services in the absence of agreed, and relatively specific, joint operating concepts. As the Subcommittee knows, the Department is working to develop a broad range of joint operating and integrating concepts to address this need, but progress seems glacial. This, plus the funding issue discussed below, constitutes the major impediments to achieving the long-standing goal of having programs “born joint.”

The closest the Department has come in recent years to a successful major joint acquisition program is the Joint Strike Fighter - now the F-35. Research at IDA into the differences between the originally joint F-111 program that reverted to a single Service, and the largely successful (to date) joint F-35 program, identified one overriding factor. In the F-111 program the Navy and Air Force failed to agree on an acceptable set of joint performance requirements. Such agreement, reached early in the F-35 program, has largely persisted through many changes, by virtue of the joint management and funding structure. But the F-35 type of “jointness” flows more from a desire to save acquisition and maintenance costs through the use of common equipment than it does from the need to operate more jointly. Even with common airframes, the Services could in principle equip them with uncommon sensors, communications equipment, and weapons – the type of equipment important to joint operations.

### **Joint Funding**

Second, a single flow path for funding clearly helps. When the Marines plan their future spending programs, they can internally resolve issues and assemble, at least within the Department of the Navy, a coherent long-range program plan for the several components important to joint air-ground operations. Other examples include the integrated radar and missile air defense systems that were developed separately by the Army, Navy, and Air Force. There are no examples of single sources of funding for successful major cross-service programs that come to my mind.

The lack of planned interoperability among the military services is not a new problem even though warfighters in the field have a strong recent record of successful last-minute improvisation that ends up getting the job done, albeit at considerable expense in time and efficiency. In discussing the acquisition of equipment important to the interoperability of US forces, the 2004 CSIS Beyond Goldwater-Nichols (BG-N) report stated:

*This enduring lack of jointness in how DoD procures weapons has both raised the cost of military operations (e.g., persistent interoperability problems cause friendly fire casualties) and constrained the growth of US military capabilities (e.g., Services invest too much in duplicative capabilities and too little in Low Density/ High Demand assets)*

Nowhere is the need for improved coherence in the acquisition of military capabilities more apparent than in command, control, and communications systems.

Citing “repeated failures over the past decade to develop common, interoperable” command and control systems, the aforementioned CSIS report explicitly recommended that funding and responsibility for managing such programs be transferred from the Services to a new joint management entity. I have seen no concrete steps being taken to implement such a recommendation.

The Department is reportedly looking broadly into the planning for such joint command and control and supporting information infrastructure programs. The central issue being addressed is how to assure that separately acquired and fielded programs provide the necessary integrated joint capabilities.

It is worth noting that “purple” funding of common support activities has largely proven its worth. Despite their considerable birthing and growing pains, such DoD-wide activities as the Defense Logistics Agency, Defense Information Services Agency, Defense Finance and Accounting Service, and the Defense Contract Management Agency, are widely agreed to now be working well and are considerably less costly than would have been the case had the Services each retained such functions. This outcome is much to the credit of my fellow witness, Dr. John Hamre, who oversaw much of this effort as Comptroller and Deputy Secretary in the previous administration. It is my belief that more such “joint” funding is a necessary condition for achieving much real progress towards joint acquisition.

My sense is that it may take another Herculean effort, such as that that went into the Goldwater-Nichols Act itself, to boldly move the Department into a new approach to acquiring capabilities that are truly “born joint”. This Subcommittee clearly has the expertise to lead such an effort. It seems unrealistic to expect much more progress toward improved joint acquisition without a major effort by both the Secretary of Defense and the Congress.

## **ACCESS TO TECHNOLOGY**

This Subcommittee is well aware that the day has long passed when the Defense Department could rely exclusively, or even primarily, on technology that had been developed as a result of DoD investments. The explosion of new applied technology in the US commercial sector, coincident with globalization of such developments, poses a significant challenge to DoD. No longer can government laboratories and traditional defense contractors be looked to as the primary source of new technologies important to

future defense systems. Indeed, acknowledgement of this trend lies behind many of the acquisition “reforms” adopted by the Department over the past decade, including its enthusiasm for the use of Other Transaction Authority (OTA) agreements to hopefully gain access to non-traditional suppliers.

But applied technology flows out of basic research, which in this country is still dependent on Federal funding. The problem for DoD is being exacerbated both by the ongoing decline in Defense and other US Government investment in basic and applied research, and by the Defense Department’s decision in the 1990s to cease giving industry incentives to spend its government-reimbursed independent research and development funding on long-term science and technology projects that are of particular importance to national defense needs. The simple solutions to these trends, to which this Subcommittee could contribute its expertise and influence, would be to reverse the decline of DoD spending on basic research and to encourage the Department to resume its former practice of “scoring” industry independent research and development (IR&D) projects against the Department’s long-term goals when determining the level at which such investments would be reimbursed via DoD contract overhead allowances.

More broadly, I invite the Subcommittee’s attention to the excellent treatment of this increasing urgent national problem that Norm Augustine’s National Academy *Committee on Prospering in the Global Economy of the 21<sup>st</sup> Century* recently produced for the Senate Energy and Natural Resources Committee. This study emphasized that the federal government is the *only* source for funding basic research in the United States; that corporate R&D funding is product-oriented; and, noting that many of today’s most successful commercial technologies originated in basic research funded by the Department of Defense, where support for such funding continues to wane, recommended that DoD funding of basic research be increased at a rate of 10% per year. The growing plight of the ocean science community, whose research is so important to a broad range of national security issues, adds conviction to my recommendation that the members of this Subcommittee strongly support the efforts of the Subcommittee on Emerging Threats and Capabilities to implement the spirit of the Augustine Committee’s recommendation. Such a funding increase would also benefit efforts to increase the availability of the meaningful, interesting, and important research work needed to further motivate US students to pursue challenging technical and scientific education goals.

The more complex issue involves DoD access to advanced technology whose centers of excellence are outside the United States. To date DoD has relied primarily on its large, multinational prime contractors to manage such access, and this may continue to be the best approach. However, this is an area that I believe warrants increased attention, as do so many facets of the defense acquisition process.

## **OTHER TOPICS**

### **Industrial Base**

Just as the American public broadly benefits from the growing globalization of the consumer economy, within limits, the Defense Department also broadly benefits from the globalization of the supply chain both for the lowered cost of its commercial products needs and its access to advanced technologies for which the US is not a leader. But for supplies for which a surge capacity is assessed as an important element of US national security planning, there is no reason to depart from the current practice of funding such standby capacity in the US. Such needs include, for example, vaccine production; antidote production; other limited shelf-life supplies; and some types of ammunition.

It is also vitally important that the equipment on which the United States relies for its most sensitive communications and intelligence activities are assembled from “trusted sources” of components.

There are obviously other strong incentives for the United States to ensure that its industrial base can continue to produce the principal weapons systems that are used to equip its military forces. However, as DoD becomes increasingly dependent on technology for which other free world countries may have gained a competitive advantage, it is unrealistic—even counterproductive—to demand that arbitrary percentages of DoD equipment components and software originate in the United States. Furthermore, paying for the maintenance of excess defense industrial production capacity in the hopes of reducing costs through competition is also generally counterproductive, as discussed below.

Paying for extra capability to design and prototype new, innovative forms of military equipment may well be worthwhile, but, as also discussed below, such a program would need to be made profitable in its own right to be successful.

## **Competition**

There are two chief perceived benefits of formal competition in defense acquisition programs: design innovation and cost reduction.

### **Design Innovation**

In my experience, competition is very effective in bringing forth the best industry can offer at the beginning of every major new acquisition program. Top talent is frequently switched from lucrative ongoing programs to help formulate the company's technical concepts for the big competition at hand. And the reason for this success is not hard to discern; the companies know that the winner probably will never have to face further real competition on that program. For this reason, bidders not only commit their best design talent, but also frequently promise to share the cost of the early development phase of the program. Some may still believe this is a good deal for the government; *I do not*. By accepting such in-kind "contributions" early in development, the government sub-optimizes its long-term interests and makes some implicit commitment that it will proceed into full-scale development and production. Such a commitment, whether implicit or not, limits the government's ability to decide on alternate courses of action. Furthermore, if the government places any significant weight on such "up-front" contributions when selecting the prime contractor, it may well forgo much larger benefits available from other bidders in terms of lower future production and operating cost and/or better system performance features. Such considerations have motivated the Department's growing use of "best value" source selection criteria in recent years.

As noted earlier, I believe at least the early phases of research and development (R&D) activity should be made profitable in their own right, without the promise of a production run to "get well." Such an approach could greatly increase the government's ability to keep competent design teams productively employed without the obligation to take designs to production before they may be needed. It might also bring into the DoD orbit many nontraditional R&D firms that may be able to contribute innovative ideas. But this would be a hard sell, in part because of the very real intellectual property ownership issues that surround such programs.

There are also always ongoing pressures to only invest significantly in developments for which there is a follow-on production program. My recollection is that the Joint Strike Fighter program started as a series of design and prototype testing

competitions for advanced aircraft components and subsystems, and that industry, and perhaps the Congress, quickly insisted that such expenditures would be justified only if an aircraft development program was established in the funded program of record.

### **Cost reduction**

In contrast to the benefits of formal design competition, I believe the cost reduction benefits of competition are highly overestimated, at least at the major system level. Indeed, as a practical matter, once a major defense contractor has won a design competition and any subsequent down-select that is intended to lead to production, the threat of further competition will have largely vanished. At that point the contractor's duty to his shareholders to keep costs and profits up on the prevalent cost-type contracts begins to conflict directly with the government's interest in driving costs down. From time to time the Department has attempted to compete the subsequent production of complex systems, such as battlefield trucks. Although I have seen no recent systematic study of the results of such competition, my sense is that most results were disappointing due to such factors as long delays and unexpected costs in fully qualifying the alternate supplier. Such prime-contract re-competitions are becoming much more difficult to orchestrate as systems become more complex and tightly integrated, and the intellectual property rights to embedded commercial products and components become harder to deal with.

Once a qualified prime contractor is producing satisfactory equipment under a prime contract, the government needs to employ tools other than direct re-competition to encourage cost limitations and reductions. These tools take many forms, such as detailed tracking of the contractor's actual costs, component break out, and incentive fees and are highly unique to government management practices. The private sector has very few, if any, long-term cost-plus contractual relationships where the buyer has no alternate supplier reasonably available.

### **Other types of competition**

There is a third potential use of competition in defense acquisition that has not been generally adopted but may be worth additional attention. This is the notion of cross-system and even cross-Service competition for funding to meet a real "mission" or "capability" need. Such an approach has been suggested by past Defense Science Board task forces through such broad examples as comparing the costs of striking inland targets

from Navy carriers with the costs of Air Force bombers for the same effects. The Department is not currently organized or staffed to routinely conduct such studies “in house.” Having conducted a Deep Attack Weapons Study along these lines for OSD several years ago, IDA can attest to the difficulties of such attempts at explicit cross-service competition

Finally, I note that the Department at one time championed a “Challenge” program in which outside suppliers could formally offer to provide some piece of equipment, or subsystem, to DoD at a lower price than was currently on contract. The opportunities for benefiting from such a program have probably declined in recent years as the Department has undertaken less and less of its own system integration work, thereby reducing its ability to switch sources for components or subsystems. Nevertheless, some such new effort to open ongoing DoD contracts to new ideas and technologies from outside suppliers may well be warranted.

### **Outsourcing**

As noted earlier, I am not prepared to comment on the details of the problems involving contracting for services, although I recognize the importance of Senator Levin’s comments thereon in September.

However, I was on the fringes of DoD’s involvement with the Reinvention of Government and supported the use of public-private competitions for the types of services that one can find in the “Yellow Pages.”

I still believe in the value to the Department of such competitions for routine services that are not “inherently governmental,” but would be quick to recognize that there are problems in managing such contracts when they are outsourced.

Representing the government’s interests in structuring and overseeing major defense acquisition programs is not a skill set that one finds in the Yellow Pages. At the level of weapons systems acquisition, the Government is different. There is a very real limit to the applicability of commercial program management practices to the Government’s needs. When a private company chooses to undertake a major, multiyear development of a complex new system, it does not outsource the bulk of the work using a cost-plus multi-decade contract. Indeed, almost all major systems developments in the commercial sector are done “in house” and very little information on either the costs or

success rate of such developments is available in the public domain. Furthermore, the company program managers have great control over, and confidence in the stability of their own budgets. I make this point not in defense of any current government acquisition practice, or to advocate a return to the arsenal system, but to remind the Subcommittee, though I doubt it is necessary, that contracting for such major system developments really is unique to the government

As this Subcommittee knows from the IDA review of the FCS program, and the related testimony of Dave Graham, the IDA project leader, IDA found that the FCS integrated Army/Boeing “One Team” management approach “results in inherent tensions in the roles of Army participants—teammate vs. customer representative, and in the roles of industry representatives—teammate vs. representative of corporate management and stockholders.” IDA recommended that the Army strengthen its corporate independent assessment capabilities. I cite this report not to imply that there is a particular new or ongoing problem in the FCS program, but as an example of what I personally think should be the high-water mark for outsourcing the types of systems integration activities that were once the hallmark of the Defense Department’s in-house technical abilities.

Acting on behalf of the government in overseeing the design and integration of complex, multi-billion dollar acquisition programs takes a high level of skill and experience. Ensuring that the government has enough such talent is a major and continuing challenge. I believe the government needs to take strong actions to beef up this senior segment of the acquisition workforce. This particularly includes systems engineering talent at both the PM and PEO levels. Hopefully, the new National Security Personnel System will facilitate such actions by the Department.

## **CLOSING**

Finally, I would like to compliment the Chairman and the Subcommittee for holding these hearings. In my view, they provide an exceptionally valuable forum both for the Subcommittee to gather information important to the discharge of its legislative duties and for the broader goal of elevating the public dialog on matters vital to the future security of this Nation.

Thank you for the opportunity to present my views.

### *About the Institute for Defense Analyses (IDA)*

The Institute for Defense Analyses is a non-profit corporation that administers three federally funded research and development centers to assist the United States Government in addressing important national security issues, particularly those requiring scientific and technical expertise.

IDA only works for the Government. To avoid institutional pressures to support Service positions, IDA does not work directly for the military departments. Also, to ensure freedom from commercial or other potential conflicts of interest, IDA does not work for private industry.

IDA takes great pride in the high caliber and timeliness of its analyses, which are produced in an atmosphere that encourages independent thinking and objective results. While working closely with sponsors to define research goals, IDA enforces a rigorous review to ensure its analyses and conclusions are thorough and sound.

### *IDA's History*

IDA traces its roots to 1947, when Secretary of Defense James Forrestal established the Weapons Systems Evaluation Group (WSEG) to provide technical analyses of weapons systems and programs. In the mid-1950s, the Secretary of Defense and the Chairman of the Joint Chiefs of Staff asked the Massachusetts Institute of Technology to form a civilian, nonprofit research institute. The Institute would operate under the auspices of a university consortium to attract highly qualified scientists to assist WSEG in addressing the nation's most challenging security problems.

Over the years, IDA has modified its structure to remain responsive to sponsor needs. In 1958, at the request of the Secretary of Defense, IDA established a division to support the newly created Advanced Research Projects Agency. Shortly thereafter, the mandate of this division was broadened to include scientific and technical studies for all offices of the Director of Defense, Research and Engineering. Subsequent divisions were established to provide cost analyses, computer software and engineering, strategy and force assessments, and operational test and evaluation. We created the Simulation Center in the early 1990s to focus on advanced distributed simulation, and most recently, established the Joint Advanced Warfighting Program to develop new operational concepts.

***Witness Background: Gene Porter***

My association with defense acquisition issues spans over 30 years. I spent the 1970s in the office formerly known as Systems Analysis, now known as Program Analysis and Evaluation. This office is the Secretary's gatekeeper for the independent analysis of the Department's long-range program plans—the Future Years Defense Program, or FYDP. At the end of that decade I was confident of my knowledge of defense acquisition management, having led or participated in many assessments of major acquisition programs and related mission-area studies.

Then in 1980 I went to work for a major defense electronics company and discovered that I actually knew very little about how the government actually conducted its business with industry. I was particularly dismayed at the lack of coherence in defense requests for proposals and by what appeared to be needless differences in procurement practices between the various Services. Therefore, in 1990 I eagerly accepted the late Undersecretary Don Yockey's invitation to return to OSD, this time in the Acquisition Policy office, in hopes of helping improve the situation.

OSD enthusiasm for acquisition reform surged in the early nineties and focused on a broad range of potential changes, primarily to detailed contracting rules and procedures. Some of these have proven quite successful, such as Bill Perry's efforts to avoid the cost of acquiring separate "Milspec" compliant components, particularly electronic components, when lower-cost but suitably reliable commercial components are available. Other reforms have proven somewhat more problematic, such as one that liberalized the definition of commercial items for which certified cost or pricing data would not be required. As these reforms proceeded in 1994, I retired from the Senior Executive Service and joined the Center for Naval Analyses, where I served first as the Deputy Executive Director of the congressionally chartered Commission on the Roles and Missions of the Armed Forces (CORM), and then as the scientific analyst assigned to the Assistant Secretary of the Navy for Research Development and Acquisition, where I focused on efforts to elevate considerations of total ownership cost.

Since moving to IDA in 1999, I have contributed to a number of team efforts, including the 2004 review of the Army's FCS program, and various ongoing studies in support of the current Quadrennial Defense Review.

My direct military experience included service in several Atlantic Fleet nuclear submarines following graduate school.