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**THE DEFENSE INDUSTRIAL BASE:
A NATIONAL SECURITY IMPERATIVE**

HEARING

BEFORE THE

PANEL ON BUSINESS CHALLENGES WITHIN THE
DEFENSE INDUSTRY

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

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PANEL ON BUSINESS CHALLENGES WITHIN THE DEFENSE INDUSTRY

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**THE DEFENSE INDUSTRIAL BASE: A NATIONAL
SECURITY IMPERATIVE**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
PANEL ON BUSINESS CHALLENGES WITHIN
THE DEFENSE INDUSTRY,
Washington, DC, Monday, October 24, 2011.

The panel met, pursuant to call, at 3:02 p.m., in room 2212, Rayburn House Office Building, Hon. Bill Shuster (chairman of the panel) presiding.

OPENING STATEMENT OF HON. BILL SHUSTER, A REPRESENTATIVE FROM PENNSYLVANIA, CHAIRMAN, PANEL ON BUSINESS CHALLENGES WITHIN THE DEFENSE INDUSTRY

Mr. SHUSTER. The hearing will come to order. I want to thank everybody for joining us here today. It is especially good to see my colleagues back from our recess. I hope it was productive for everybody. I believe that today's hearing will serve as a foundational discussion for this panel as it moves forward in its working to examine the challenges of doing business with the Department of Defense [DOD]. The House Armed Services Committee [HASC] has led the way in improving how DOD develops and buys equipment and needs. As most of you know, the HASC has successfully shepherded a substantial reform effort, the Weapons System Acquisition Act, through the legislative process to the President's desk. While the bill did much to garner efficiency, increase transparency and foster competition, there is still room for improving DOD's business practices.

I am a strong believer in the fact that you can't solve the problem without looking at both sides of the equation. And that is exactly why Chairman McKeon and Ranking Member Smith established this panel, to look at the business side of the DOD acquisition system. I wanted to start this series of hearings with a broad look at the defense industrial base [DIB] to give the panel a clear framework for moving forward. Today we have well-recognized leaders in public policy regarding the defense industrial base joining us.

On November the 1st, we will follow up with senior officials from DOD's Manufacturing and Industrial Base Policy office and Small Business office to give us their views on the issue. After that, we will move on to several hearings focused on some of the specific issues and challenges facing the businesses that are eager to provide technologies and services to support our warfighters.

We have some terrific witnesses with us today, and I am very grateful that they have taken the time to share their insights and

expertise on the defense industrial base with my colleagues. I would like to introduce them. First, Mr. Barry Watts, Senior Fellow at the Center for Strategic and Budgetary Assessment [CSBA]; Mr. Fred Downey, Vice President, National Security, Aerospace Industries Association [AIA]; and Pierre Chao, Senior Associate, International Security Programs, Center for Strategic and International Studies [CSIS].

Again, gentlemen, thanks for taking the time to be here with us today. I also want to take a minute to thank Mr. Schilling and Mr. Loeb sack and their hard-working staffs for hosting the panel in the Quad Cities area of Illinois and Iowa. We had a very informative discussion there with industry leaders and learned a great deal about what goes on at the Rock Island Arsenal. It was an extremely useful trip and I appreciate all the effort that went into it. I also want to thank Black Hawk College for letting us use their facilities to hold the meeting.

The committee staff prepared a summary of discussion with the industry at Rock Island and it was provided to all of the panel members. Without objection, I would like that to be entered into the record. Hearing no objection, so ordered.

[The information referred to can be found in the Appendix on page 97.]

Mr. SHUSTER. On Friday, members of the panel will travel to Akron, Ohio, to hear from the industrial base in that area and to meet with engineers and scientists at the University of Akron who are engaged in efforts to help DOD prevent and mitigate corrosion. In these tough economic times, we have got to make sure we are doing everything we can to get the most out of every piece of equipment we ask the American taxpayer to provide, and mitigating and preventing corrosion is a critical part of doing so. I am very much looking forward to that trip and the discussions on developing and in transition critical technologies to help DOD sustain its equipment.

I want to thank Ms. Sutton for inviting us to her district. With that, I turn to my friend from Washington, Mr. Larsen, for any remarks he might want to make.

[The prepared statement of Mr. Shuster can be found in the Appendix on page 33.]

**STATEMENT OF HON. RICK LARSEN, A REPRESENTATIVE
FROM WASHINGTON, RANKING MEMBER, PANEL ON BUSINESS CHALLENGES WITHIN THE DEFENSE INDUSTRY**

Mr. LARSEN. Thank you, Mr. Chairman. I appreciate the opportunity to make a brief opening statement, but also, again, to thank you for your leadership on this panel. The panel is tasked with looking at ways the Department can improve its contracting practices for the benefit of our warfighters, taxpayers and businesses. DOD must continue its efforts of building a strategic dynamic contracting process, one that ensures those who have great products do not fall by the wayside. A key component of this process is ensuring that we protect and grow our Nation's defense industrial base. The U.S. defense base has a long history of producing the best military systems in the world. We must ensure that this con-

tinues both for our warfighter and because it creates jobs here in the U.S.

In August, the chairman and I heard from several businesses in my own district about successes and challenges that they have had with the DOD and with contracting. All of these, in fact, were small businesses. These anecdotal accounts help give us an understanding of the real-world experiences small businesses face and the challenges they face while trying to do contracting with a very large government bureaucracy.

Today we have witnesses that have studied Department of Defense policy and laid out policy implications and reforms that we should seriously consider as we move forward in looking at how we can help small- and medium-sized businesses access the Department of Defense contracting process. I look forward to hearing today's testimony. Thank you again, Mr. Chairman.

[The prepared statement of Mr. Larsen can be found in the Appendix on page 35.]

Mr. SHUSTER. Thank you. And with that, we will proceed with our witnesses. First, Mr. Watts. You may proceed. But I see in your bio here, you are a graduate of the University of Pittsburgh. So are you a native of western Pennsylvania, or just attended graduate school there?

Mr. WATTS. No. I attended graduate school there.

Mr. SHUSTER. All right. That is great. You don't have that Pittsburghese accent. Or at least I didn't pick up on it yet. Well, thank you very much for being here today.

STATEMENT OF BARRY WATTS, SENIOR FELLOW, CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS

Mr. WATTS. Well, Chairman Shuster, Mr. Larsen, members of the panel, thank you very much for giving me the opportunity to testify. I just want to make a couple of quick comments about caveats for the Center for Strategic and Budgetary Assessment's report that we put out earlier in the year. We focused pretty much on prime contractors and major defense acquisition programs in that particular report. As a very small think tank, we have very little capacity to do the sort of thing that Brett Lambert is trying to do over in the Pentagon and that is, go down to the lower tiers and the parts suppliers, and even the material suppliers. That is an enormous job and a small group like ours, it is just beyond what we can do.

We also didn't say much about some of the ITAR [International Traffic in Arms Regulations] constraints, the legislative constraints that make it difficult for the defense industrial base to access the global defense economy, as Jacques Gansler talked about at great length in his recent book, "Democracy's Arsenal." Beyond that, I will just make a couple of comments about the three pieces that were in my written statement.

First of all—and I am not going to say much about this—I think, here in Congress, it is clear that this is not a normal free market economy when we talk about the defense industrial base. It is very different than consumer electronics or the automobile industry. It is highly regulated. The regulators and the customer are one in the same, the U.S. Government, and there are piles and piles of regula-

tions and statutes that try to make the business processes as low risk as possible when you do—particularly when you do major programs. And I would certainly suggest that whatever can be done to try to relieve some of that burden would be useful going forward.

Given the present fiscal situation that the Pentagon is facing, they have had almost a decade of growing budgets, they had supplementals, and now the base defense budget is surely going to start going down and will probably go down for a period of time into the future. Given that, I think it is essential for the Pentagon and the U.S. Government writ large to develop a coherent long-term strategy for deciding what pieces of the defense industrial base are really going to be important going forward over the next several decades and make some real strategic choices.

We talked in the report about six or seven or eight major areas which we think should be invested in preferentially. We did not give you or suggest a list of what those are. But we think if you are going to have a strategy insofar as strategy is about choice, that you are going to have to focus on capability areas that are probably in the single digits. If you end up with 75 or 123 most important things, you just don't have a strategy. And it is very difficult, given the interests of the various, here on the Hill and Congress, and the various services and constituencies and industry, to not end up with a very large list.

So I think making that choice going forward is really critical. Let me just say that it is not easy. You need to start with the challenges that we will face from a national security standpoint over the next several decades, and that is going to be difficult enough figuring out what the really seven or eight, or maybe nine really important areas are. Then secondly, if we could get some consensus on what those are, there is the problem of deciding what pieces of the industrial base, the defense industrial base, would really support those capabilities going forward.

I mentioned in my statement anti-access/area-denial capabilities. And if you thought that was important, that was an area where we really have invested preferentially, there is a whole range of different options that you could choose. You could buy more Aegis cruisers or emphasize missile defense. You might want to invest long term in directed energy. You might think more about submersible combatants. There are a whole range of things. Both of those choices, deciding what the really important threats to pay attention to over the next several decades and deciding what pieces of the industrial base are really critical to supporting them. Those are difficult choices. And with that, I will end. My 5 minutes are up.

Mr. SHUSTER. Thank you very much, Mr. Watts.

[The prepared statement of Mr. Watts can be found in the Appendix on page 37.]

Mr. SHUSTER. With that, Mr. Downey.

STATEMENT OF FRED DOWNEY, VICE PRESIDENT, NATIONAL SECURITY, AEROSPACE INDUSTRIES ASSOCIATION

Mr. DOWNEY. Mr. Chairman, Mr. Larsen, distinguished members of the panel, it is a real pleasure for me to be here as a representative of more than 350 companies who are part of the aerospace and

defense industrial base. The week of September 12th was National Aerospace Week by congressional resolution. During that week, we celebrated our legacy of global leadership and aviation defense in space. In the coming months, several momentous decisions will be made about the Nation's budget, which will ultimately affect what kind of aerospace and defense industrial base we will have, what capabilities it will possess, and whether or not we will remain the global leaders. Those decisions will be taken in the absence of an industrial base strategy, and if history repeats itself, without full participation from those who must manage the industrial base during what is a time of historic reorganization.

I think most Americans would agree that the 20th century was defined by aerospace, and that it was largely our century because we were second to none in aerospace. I think the 21st century will also be defined by aerospace. The question is whether we are still going to be second to none.

While most accept that the industrial base is a national strategic asset, too many choose to treat it with benign neglect, assuming that the free market will always work to make sure we stay second to none. As Mr. Watts said, although it never really was a free market, it was so successful that many believe it is now a national birthright.

But that was then. The industrial base that existed then doesn't exist today. It is a far cry from the military industrial complex of the Eisenhower era. In the 20 years since the cold war, nearly 150 significant defense companies have consolidated to 6. The number of big companies left the market, almost none have entered it. In the post-cold war, consolidation has created a situation where the top firms have grown individually, but the market has shrunk significantly.

So, far from being the powerhouse that many suggest, the combined annual revenue of the top seven members of the aerospace and defense industrial base today is about one half of the annual revenue of Wal-Mart. That is how it has changed since the days of the cold war. If these trends continue and the defense budget continues to be cut, the capability to deliver critical militarily unique systems will atrophy and the capability our troops and the American people expect might not be available. We have to have the capability to design, develop, produce and support complex systems. And that requires having programs to work on. If we don't, the companies that make up our industrial base can't continue to invest in the workforce, plant and research that might be needed. The impact will be felt first on our workforce. We have only half the workers we did 30 years ago and the recession and budget reductions already have further reduced that amount. Recent analysis performed by Dr. Fuller at George Mason University and others find that the total American job loss for just the first part of the Budget Control Act [BCA] will be approximately 430,000 jobs, and about one-third of those jobs will be from the defense, aerospace and industrial base. But it is not just jobs we are going to lose. It is the valuable human capital. The most brilliant and ambitious technicians, engineers and scientists have sought to work for the industry, but we are facing an increased competition from other

high-tech sectors for those workers. Without the challenges, we are not going to get there.

We need two things: We need budgets that produce programs that are profitable and that reach out to the talent we need, and we need an industrial base strategy that gives direction and predictability that the industry leaders need to make sound strategic business decisions. Without those two things, it is doubtful whether we will have the aerospace and defense industrial base that has provided the capability that our soldiers, sailors and airmen and the American people have come to expect. Thank you, sir.

Mr. SHUSTER. Thank you.

[The prepared statement of Mr. Downey can be found in the Appendix on page 47.]

Mr. SHUSTER. Mr. Chao.

STATEMENT OF PIERRE CHAO, SENIOR ASSOCIATE, CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES

Mr. CHAO. Mr. Shuster, Mr. Larsen and members of the panel, thank you for inviting me. As was noted, I am a senior associate at CSIS. I am also a managing partner at Renaissance Strategic Advisors. So I am not only a student of the industry, but also a practitioner in it. You are asking a great question in terms—and an important one, particularly given the budget environment that we are entering into. However, it is a question that you need to, I think, approach with caution, because one of the worst things that one can apply when it comes to defense industrial policy is a one-size-fits-all mentality. In fact, more damage has been done to the industry by trying to apply these one-size-fits-all policies. We would suggest that thinking about the industry as a whole in sort of three constituent parts: The emerging technologies and companies, think cyber, think directed energy, think mobile applications, the new technologies of today as one sort of group that has its own issues and topics.

You then have the core part of the market, or the mature part, the constituents of Mr. Downey, the Lockheeds, the Northrops and the Boeings of the world and their supplier base to Mr. Larsen's point, that there is a whole small business community. And then there is the much more mature legacy component. Those are the remaining sort of monopoly or duopoly manufacturers of—for example, the shipbuilders, space launch, went down to one major supplier, fixed-wing aircraft, went down to two, and tank manufacturing, went down to one.

The policy issues and the contracting issues are different. On the emerging sort of category, this is where technology is important, access to technological talent. The issue that we have in our schools with science and technology is a critical issue. They can't find enough scientists. Export controls are absolutely critical to this category where we are not getting inside the technology because people are afraid to put technology in the U.S. because they can't get it back out again. It has become a serious issue. The lack of venture capital. And even the overall environments for these small emerging companies operating in a budgetary environment, frankly, under continuing resolutions [CRs], it is very hard for these young companies to sort of enter and come in and do things.

The other thing that is very important to think about when you are thinking about policies relative to these, don't shut down competition too early. In this part of the segment, you like having 8, 9, 10 different players, because we are still trying to figure out what is the right technology. Think about what the aircraft industry looked like in the 1920s, where it had eight or nine different companies. They were making airplanes with three wings, two wings, engines in the front and the back. We didn't know which one was the right way. You can think of the UAV [unmanned aerial vehicle] industry today as the same one. The Orville and Wilbur Wrights of the 21st century are playing in the new space launch markets and the UAVs; shutting off competition too early is actually dangerous; preservation of the science and technology budgets is critical for this constituency.

So the 6163 budget funding to places like DARPA [Defense Advanced Research Projects Agency] are sort of the lubricant or the thing that keeps this part of the industrial base vital and alive. In the mature part or the core part of the supplier base, these again are the Lockheed Martins, the Northrop Grummans, the General Dynamics and the Boeings of the world. They represent, frankly, the jobs that we have in our districts today, and in many cases, they are in some of the most sort of underrepresented areas. And their supplier base underneath them sort of represent the mainstay.

Here this is where the core questions about DOD acquisition processes, how difficult is it, how much overhead burdens are we putting on them with unneeded processes and others. This is where the call for strategy and focus that Mr. Watts and Mr. Downey called for is going to be absolutely critical. They can figure their way out as long as they know where we are going. Right? And in the absence of a strategy, it becomes too easy for some of them to sit there and say—just like they did in the 1990s—this is too difficult, I am going to go home, I am going to go somewhere else. A great example.

And we also have to remember that defense is a small market for some of these. We went through untold pain related to the tanker program, for example, over about 160 airplanes in the end that represents about 10 weeks worth of production for Boeing and Airbus.

So keeping that in mind in terms of we deal with that. The legacy one is probably one of the most complex for you because it represents core capabilities, tanks, submarines, aircraft, space launch, critical capabilities where we have an advantage, but we are down to a very small set of suppliers. And frankly, it sometimes takes a lot of money in order to keep that core capability set. And here we just need to decide which ones are core capability sets that we want to continue, and where we need to put in sufficient engineering and money to sustain engineering talent versus who is the last buggy whip manufacturer and actually should go away, because they are in more the legacy side of it.

So from that perspective, the issue of making sure that there is enough money to sustain that old legacy set of capabilities until the new emerging guys rise becomes one of the most critical questions. This is really important for the small suppliers because I think

where you will find the most amount of vulnerability is in the last propeller manufacturer for the U.S. Navy, for example. Or there is an example of—it turns out the last maker of linen bags for artillery shells also does habits for nuns. And the nuns decide to pull their contract, and now suddenly the U.S. Navy is worried about who is going to make the last set of linen bags for the artillery shells.

You are going to find all sorts of strange, bizarre pockets of industry that are actually absolutely critical and important. And so from that perspective, the policies that work at one end of the industry don't work at the other. So as you go through your work, which I commend highly, the right sets of questions, think through those buckets and the impact that it has across those different parts of the industry. Thank you.

Mr. SHUSTER. Thank you very much.

[The prepared statement of Mr. Chao can be found in the Appendix on page 61.]

Mr. SHUSTER. Mr. Chao, could you talk a little a bit more about the technology, the emerging companies and the technology, we are keeping it out of DOD. We heard in one of our hearings where—because of the ITAR regulations, that it is very difficult once you have a technology that it is in the open market with our folks providing to DOD can't sell commercially now, so it really constrains them. So what you are suggesting is that people are saying I am not even going to start selling to the United States Government because they are going to capture this and I am going to be hamstrung.

Mr. CHAO. This is one of the thorniest topics on the landscape in terms of export control reform. I know this committee and Congress and the Administration have been looking at this topic. We have the beginnings of a lot of strange, unintended consequences because of the way the policy has been put into place. It has logically been put into place in order to prevent core American technology from leaking out to adversaries.

It is having the unintended consequences the way it is being implemented where companies are afraid to put the technology into the U.S. and are keeping it outside. You are seeing this mostly in very cutting edge telecommunication technologies. I am aware of at least two instances where global companies have decided to sell off their U.S.-related businesses in order to be able to compete globally because it was, again, too difficult.

You are beginning to hear other countries about developing products that are "ITAR free." And when you talk to those companies—and CSIS did a big study on this—these are countries and companies that say we would have gladly bought American had we been allowed to. Since we weren't, we had to build our own set of technologies.

So we have to figure out a way to reconcile that core need of making sure that our core technology doesn't go out while mitigating some of these unintended consequences. And I would argue those unintended consequences are rising at such a level that it is getting to crisis levels where addressing this issue, I think, is going to be absolutely critical.

Mr. SHUSTER. And you talked about shutting off competition. Where is that occurring and how is that occurring?

Mr. CHAO. It is not occurring yet. But as we go into a tighter budget environment, it is going to become very easy to sit there and take a look at that list and say boy, I am running 10 UAV competitions or programs, maybe I should just go to one. And all I am saying is 10 to 8 is probably okay. Ten to one would be disastrous because we are still trying to figure out that technology, for example. And others where the answer is becoming more evident just like it occurred with the aircraft industry where we settled on a common solution, a single-wing monocoque hull, and others, it is okay to narrow down.

Mr. SHUSTER. Thank you. The Department of Defense just came out with a report talking about long-term investments, short-term strategically looking at what I think—Mr. Watts, you talked about that. But that the report is almost schizophrenic. It talks about those things being important, yet it is going to allow the market to continue to drive our needs, or to provide for our needs and you are saying in your report that we need some kind of strategic plan moving forward to keep, like Mr. Chao said, some of our legacy, some of our other core competencies, did you see the report at all?

Mr. WATTS. Yes, I have looked at it.

Mr. SHUSTER. Your assessment is?

Mr. WATTS. Well, it seems to continue to assume that this industry operates like consumer electronics or the automobile industry, and if that is not the case, then trying to develop a strategy based on an incorrect assumption, an incorrect understanding of the nature of what they are trying to manage and develop a strategy for is probably not going to succeed.

Dr. Gansler, going all the way back to 1980, pointed out that because of the acceptance of that assumption, that incorrect assumption that it is a normal free market and competition will really work the same as it does in consumer electronics or flat-screen TVs, the policies, based on that assumption, have generally done more harm than good. So now in fairness to that report, they did talk about the service aspects of defense acquisition as opposed to major weapons systems. And the use of competition may be more useful in the services in the defense procurement.

So there is a point to be made there in terms of the way they structured the report. But still, the assumption about the nature of the industry just, as far as I can tell, has been wrong since the 1950s.

Mr. SHUSTER. Mr. Downey, you concur with that, for the most part, from the sounds of your testimony?

Mr. DOWNEY. Yeah. I do entirely. I think competition certainly ought to be used for those sectors of the industry where it may be effective. Electronics is a key area. But there is not going to be much competition for a nuclear submarine or a long-range bomber. There just aren't enough companies in the market. So you can't have classic competition in some core capabilities. And I think the challenge for the Pentagon is to understand the difference and construct a strategy that is adequate to deal with the differences, as Pierre [Mr. Chao] has said.

Mr. SHUSTER. And I fully intend—at some point, we will have the folks from the DOD in front of us to ask why they believe that this can be a market driven to provide us with all when it is clear when most people look at it—when you look at it as with common sense, that DOD is the regulator, the procurer, there is just one U.S. Department of Defense. Why do you think, in their minds, are they just kicking the can down the road, because we have got fiscal financial restraints?

Mr. WATTS. I am just puzzled by why that has persisted as long as it has, is all I can say. It seems to be a myth at best. Perhaps it is just—you know, we look at the really normal market commercial parts of our industry. We think competition and innovation are very important, and we just sort of assume that it is pretty much the same in the defense industry on the one hand. On the other hand, if you look at down select from an RFP [request for proposal] to move into development of a program, most of the competition ends at that point, notwithstanding, essentially, the direction in law from that 2009 Reform Act which suggested that the Secretary of Defense should try to maintain competition throughout the life of programs. It just hasn't been happening. And the best example is the second engine for the Joint Strike Fighter.

If you go back and review the reasons that Secretary Gates gave for not going ahead with that, it was basically the tradeoff between the real upfront of \$2.7 billion or so of real cost to develop the engine, and the more theoretical benefits of the long term—you know, actually being able to compete two engines over the lifespan of that airplane, which they judged as more theoretical and ephemeral and didn't think it was worth the \$2.7 billion.

Mr. DOWNEY. Mr. Chairman, if I might add, I think part of the answer to your question is simply not watching what is happening to the market in general. In the 1950s and 1960s, when we were designing 10 aircraft and producing 6, competition made sense. When you have a market of only one or two actual producers today and no real prospect in a very capital intensive sector of attracting new competitors into the market, then you have to look at something different. And that is a hard thing to do. It is much easier simply to assume that competition will give you the innovation and go forward.

Mr. CHAO. I would also submit to you, again, it is the difference between these different segments. So when the Pentagon writes that report, they are looking at some of the emerging technologies. If you were to put an RFP out today and say I need a cyber solution, or I want to put a PDA [personal digital assistant] in every soldier's hand, I guarantee you are going to get a lot of competition, a lot of people will show up. That is not who they are representing, that is not who they are talking to. To sit there and say I want competition in tank manufacturing is silly. We haven't designed a new one. I have got a very good supplier. I am down to one. And I would be wasting money. That is more of a negotiated relationship as opposed to where you can have an open arm's length relationship—and again, services, newer technologies, that works fine. And that is where, I think, you have also the schizophrenia of the report, because they are talking about that part of the industry, I would suspect that—most of the people you are talking about the

pain that is going on inside the defense industry is from the more legacy part of the industry that is down to that narrow base.

Mr. SHUSTER. Thank you, Mr. Larsen.

Mr. LARSEN. Thank you, Mr. Chairman. Just an observation in the first 8 to 10 years of this decade when there seemed to be relative plenty to the defense budget, we were getting the same complaints. So fiscal restraint is here and coming and we have the same complaints. Sort of gets to Mr. Watts' point. I wasn't here in the 1950s, but I will take your word for it, that the complaints were the same. As always, there is always never enough money and there is always plenty of bad ideas being brought to the Government for funding, as well as good ideas. And our goal here is to be sure the good ideas, no matter where they come from, get a hearing to increase the opportunities for warfighters to get the products and services and support that they need.

One example—and I think this is interesting—I guess, I would ask Mr. Chao, Mr. Downey. This question has to do with satellites. There is a new entrant in the market who is seeking to become a competitor in the defense side of the business. So—but the core part, as you would describe it, the core part of the industry, either—well, I won't say that they don't want that competitor, but the rules are set up to encourage to support the core part of the industry, and to seemingly discourage the new entrant. This has to do with the SpaceX versus the Boeing on the satellite side.

So how do we bridge that? How do we bridge that problem as an example? I didn't come here to talk about this in particular. But it is a perfect example of where you have a new emerging entrant who actually wants to now jump the gap to become a competitor in a larger program.

Mr. CHAO. That is a great example. You can take those, and again, you can pit the classic aircraft manufacturers against the UAV manufacturers, the light vehicle—I mean, each one of these sectors has players in each place. Part of it is driven by the policy and the technological solutions that the Pentagon wants to go after. If the core way that we are going to do our satellites is large, sort of monolith, multibillion dollar satellites that have capabilities, it is going to be very hard to give that to a small startup, and it would drift itself towards there.

A policy suggestion or things that some people have suggested is that while you are keeping that core legacy, ensuring that there is a certain amount of money preserved for the technological innovation amongst the younger ones is money worth spending as the hedge, and in order to usher along some of these newer technologies. In markets where there is a large commercial market, the commercial market will do that for the Pentagon.

In places where it is a little harder and there isn't a big market, space, you happened to pick one, would sit there and say that it is probably too early to hand it over to that young startup, so I want to keep my core. But on the other hand, you are probably going to want to usher along some of these new guys to see what the new technology is.

Mr. LARSEN. Mr. Downey.

Mr. DOWNEY. I think it is a great question, and we are going to have to figure out how to integrate new innovative ways of building

capabilities that we have built before. But in general, a great idea isn't a capability. A capability is the ability to design, develop, produce, and support a system throughout its life cycle and to build the skilled workforce that can do those things.

Our policies today are to buy fewer and fewer pieces of equipment, have fewer programs with far more time between new program starts. It is very, very difficult to sustain that life-cycle capability in that kind of environment. Most small companies don't have the staying power or the resources to be able to do that. So having a one-time capability to compete for one thing doesn't necessarily mean you sustain the capability in terms of a unique military capability.

Mr. LARSEN. But that is one of the challenges facing the smaller companies in general, that longer lead time. So again, it is a process that plays against them as opposed to encouraging newer entrants into even the smaller niche areas of the defense budget, and something that we heard from folks and certainly in my district and from other places as well. So I think accepting that as a reality is part of what we don't want to do here. We want to accept that as a challenge for the Pentagon to change as a way to encourage smaller and medium-sized businesses. Maybe we can help define what is an appropriate market and what is not an appropriate market too, and help them along. We will hear from folks next week on this point.

The point you made about the aerospace defense industrial base today is not the one of the past but that we need budgets that produce programs that are profitable and stable—I don't want to put words in your mouth. I think from your members' point of view and from the current market's point of view, clearly, stable contracts that help provide a profit to the business is a good idea from your side of things, and probably the number one priority, despite the brochures; our number one priority is the warfighter and making sure they get the services and products and things so they can do the things we are asking them to do. Where those match, it is a great idea. Where they don't match, I would rather see us prevail. I would rather see the Pentagon prevail so that we are getting the services first. But if we do that, then that may not help you all prevail. So trying to find the sweet spot where you are coming—folks are coming and saying we need programs that are profitable, frankly, we have to say, well, we want programs that work, and they work on time and you are responsible for that, too.

Mr. DOWNEY. Well, I don't think there is any difference in what we are saying at all. If you have a strategy, you know where you are going, you have predictability and stability, and you have a reasonable way to do strategic business planning that satisfies your shareholders.

And we have to remember that the members of the aerospace and defense industrial base are largely private companies. They are not government companies. If they don't meet the expectations of return on investment—and here is an expert on that—then their boards are going to force them into more profitable areas.

So the more predictability and stability you have, the better opportunity to calculate that critical return on investment, and the stability allows you to build those things that work, that are on

time, and that are on the contracted price. The more instability you have, we would say, the less likelihood that you are going to get an era where you don't see cost increases and schedule slippages. We have got to get to the point where we have that understanding of what is wanted, when it is wanted and it isn't changed on an annual basis, or when a chief of service or a new administration turns a critical must-have into a nice-to-have but expendable.

Mr. LARSEN. The other challenge, if I may, Mr. Chairman, a challenge we all obviously face and we have heard from other folks is the—another solution is the board decides to go out and purchase that smaller company, right? They go out and purchase the capability and bring it in-house themselves, which is a challenge we have heard from other folks, is how do we maintain—how do we help maintain the incentive structure so that the independence and smallness and innovation side of these small- and medium-sized businesses stays independent and innovative as opposed to getting sucked in to become a division or subsidiary of a company?

Mr. CHAO. That has partly been driven by the lack of visibility in the market space. Right? The large companies have cut independent research and development down from about 5 percent of their revenues to about 1½ percent, and they have been substituting M&A [mergers and acquisitions] for that research and development because in the absence of knowing where the building wants to go, the only thing they can do is watch that little guy succeed, and at least they know that, hey, they are buying from that guy, so I will pull him in.

The other thing about the profitability—just one quick point there. This is the only market space where the customer would gladly pay a billion dollars at 8 percent margin rather than \$500 million at 20 percent margins. It is completely turned around. And that mentality sort of creates a lot of I think these perverse sort of disincentives for innovation, new entrants, et cetera. So as you hear proposals for, you know, reforming the system, just be very careful in watching about the assaults on the profit, which I can understand from a political standpoint, is actually going to end up generating the exact opposite. The industry would gladly trade lower dollars for higher profits each time. But for some reason, that is not in the mix.

Mr. LARSEN. Thank you, Mr. Chairman.

Mr. SHUSTER. Mr. Runyan.

Mr. RUNYAN. Thank you, Mr. Chairman. And, gentlemen, thank you for coming and your testimony. I just really have one question. We talk about the industrial base in this country, how it is—frankly how I look at it is the last major form of industry that we have here that is solely done here, and how we keep that, and Mr. Downey you have said obviously we need to have some confidence in projection forward in how we can procure stuff like this. My one thing, and I don't think—I don't think it gets enough traction, and I think it is really directly linked is the turn we have actually taken in space exploration associating with defense. Can you kind of talk—because I know there is a lot of one offices and small suppliers that are involved in that industry. Can you kind of touch on that a little bit?

Mr. DOWNEY. We are concerned about the space industrial base, especially as it relates to the national defense space industrial base. There is some good news. There is an emergence of commercial space companies. Some of them are, in fact, members, and we look for great things from them. But I would make the same case. Space is an expensive proposition. The return on investment right now is somewhat problematic, and we need the Government strategy that keeps us moving forward on the cutting edge of technology.

There have been many who have said they would bet you a lot that the next boots on the moon are going to be Chinese. And I am not sure that they are wrong. And only the Government, only NASA [National Aeronautics and Space Administration] and the Pentagon can have the kind of vision that translates into programs that builds the capabilities, and then as the commercial companies build their capabilities, I think they will be serious members of the United States space industrial base.

But we risk losing some critical parts. We don't have a heavy-lift capability. Our satellite capability is atrophying, and everybody knows what the situation is with our manned space program. Right now, you know, we are dependent on the Russians to get to the space station. And the capability will atrophy. It will. And the small companies that make up the supplier base won't have the majors to sell to. They will turn to something else and then we will have to start again.

Mr. RUNYAN. And I think even looking forward and planning—and we hear it—testimony all the time, that even when the DOD tries to project what is going to happen in a QDR [Quadrennial Defense Review], that changes tomorrow. So—in a way it is kind of an oxymoron to go back and forth. We are planning for the future, but the future changed yesterday after we already put the report out. So I understand the frustrating aspect of it. But to help us nail down a way to keep the industrial base here I know is a frustrating proposition. So thank you. And I yield back, Chairman.

Mr. SHUSTER. Thank you, Mr. Runyan. Ms. Hanabusa, you are next.

Ms. HANABUSA. Thank you, Mr. Chairman. And I would like to thank the chair and the ranking member for taking us to Rock Island. It was a very interesting adventure for someone from Hawaii to actually see a working foundry. I think I would like to start first with Mr. Downey. Mr. Downey, I was reviewing your publication, "Defense Investment, Finding the Right Balance." And you say things like how much is enough, which is an interesting concept of how much is enough. But I think the problem that I see that we are having is the fact that when we talk about the defense industrial base, right, some of us think about things like R&D [research and development], because we know that the Big 7 or the Big 5, as you say, in 1993, 30 companies went down to 5 in essence. And then we forget that the other component of it is truly an industrial base, in other words like the foundry, who then manufactures. But then we have this conflict of how do we decide what is going to be manufactured because of what we are developing and, it comes down to really a sense of what is, from our perspective, the defense

going to look like, or the military is going to look like into the future? And I know each of you have your different areas.

So can you tell me each one of you, beginning with Mr. Downey, you can go to Mr. Chao and Mr. Watts afterwards—what is that fundamental end goal that we are looking at, you might call it end strength, I am talking about people. What is that end goal we are looking for? Let us take it 10 years out, to 2021. What are we planning for? Because until we have a clear view of that, how can we then decide enough is enough or when is enough enough? Is 4.4 percent of GDP [gross domestic product] enough? And how do we spend that money? And how do we keep the industrial base, which is manufacturing and the research and development when we go from 30 to 5?

Mr. DOWNEY. Ms. Hanabusa, I think there are—I detect this as two parts. One is that we do need a strategy to decide what we want our military to do in the future, what forces we need to do it, and what technologies and weapons we want to provide them to do it. That is frankly supposed to be the job of the QDR. It has not done a terrific job there. So that is about getting down to what specifically we are going to do and what we need. The report you talked about was one where we looked at the issue from a macro level, and said the United States since mid-20th century has been a global power with global responsibilities and global reach that we have ended with up a military of a relative size of 1.5 million active. And when we looked at the budgets over time, and the ups and downs of the budgets, what we found was that in order to have that global military with global reach and global responsibilities, every time we came down much below 4 percent of GDP, and at the same time, reduced the investment accounts to below—much below 35 percent of that top line, we ended with up a hollow force, whatever the specific goals, whatever the specific forces were.

And so I think it is back to a point I made earlier. You have to make these choices, but you have to have adequate resources. And so we started with the assumption that the United States is going to remain a global power with a global force, with global responsibilities, and we looked at the—an interesting point too, that increasingly, that 1.5 million looks smaller and smaller to do all of those things.

So we have had a historical policy of using the technology advantage we have had. And so the amount of money that it takes to field one of those 1.5 million is going to keep increasing in the future. You are not going to reduce that requirement. So number one, we do need to know where we are going. That is a national-level political decision. We need to know how we are going to do it militarily. That is ultimately a professional military recommendation with the national political decision. But it is going to need the resources. And we believe, at AIA, that those resources are probably not going to fall much below 4 percent of GDP or 35 percent of that top line for investment, whatever those decisions are, or those plans are going to end up being hollowed out in one way or another. And the resourcing part is a congressional responsibility and decision.

Ms. HANABUSA. Mr. Chair, I am out of time. So could the other gentlemen send it in writing to me? Thank you very much.

[The information referred to can be found in the Appendix on page 111.]

Mr. SHUSTER. Sure. And with that, Mr. West. And also let me mention, Members, we will probably go for another round if you have any more questions. Because I know I have a couple more.

Mr. WEST. Thank you, Mr. Chairman, and to the ranking member and thanks to the panel for being here. And I spent a couple of days in the military. And a lot of the frustrations I saw, especially when you look at the FCS [Future Combat Systems] program, Crusader, F-22, Advanced Amphibious Assault Vehicle. In the last 20 years, we have gone from 546 Navy war vessels down to 285, but yet, 10 years ago about 19 guys got together. We spend \$1.5 million on a Tomahawk Cruise Missile. They hijack four airplanes and they flew them into buildings.

We have programs like the JTRS [Joint Tactical Radio System] and the WIN-T [Warfighter Information Network-Tactical], which the Army is saying that is one of their top requirements for communications, but yet we are not funding it.

I would like to ask this question, your assessment: Do you really believe that there is a huge disconnect between a national security strategy, national military strategy and then, of course, the requirements we send out to the defense industrial base so that we can start developing a sensing of the next 20, to 30, to maybe 40 years, of this military that we have to have to be able to fight against, you know, what is a very determined enemy that is not that much technologically advanced. So I would like to hear your assessment on that. And then what can we do to rectify that situation?

Mr. WATTS. All right, I will take a stab at that one.

Look, let me just mention one very broad capability that we have had really since the Second World War, and that is overseas power projection of conventional forces. Associated with that, one of the pieces that we have developed certainly over the last couple decades has been long-range precision strike, and frankly since Desert Storm, we have had almost a monopoly in that area. Now, one of the problems going forward is that technology is starting to proliferate, at least at the short end range, guided mortars, guided artillery, guided short-range missiles, and that is going to make power projection much more difficult for us if you think in terms of, say, something like Inchon in 1950, a traditional over-the-beach amphibious assault. So that would suggest we are going to have to make some substantial changes and adjustments.

I would be hard-pressed to think that we would like to get out of the precision strike business. I think that is going to be—that is an area which is fundamentally dependent on networking, on ISR [intelligence, surveillance, and reconnaissance] advanced capabilities that we have spent a lot of money and time and effort developing, and in a broad sense you wouldn't want to back out of that particular business long term. Given the fact that the Chinese, for example, are going fairly fast down the same path in developing anti-access/area-denial capabilities against, say, surface combatant and aircraft carrier, reaching out to ranges as far away from the Chinese coast as Guam, suggests that the future of the carrier battle group may be at risk. We have depended on that for overseas

presence and power projection for a long time. Those are hard choices that I think the services are going to have to make, so let me just mention that as one.

I mean, another area that I know is not conventional, but to think about where our nuclear capabilities have gone since the cold war ended, it would be nice if we could get, in my lifetime, to a world without nuclear weapons. I am personally fairly skeptical. I don't think we have convinced too many others around the planet who possess nuclear weapons that it is time to give them up and that they no longer have value, and that is an area of the industrial base where we have preserved the design capabilities at Lawrence Livermore and Los Alamos, which as I am sure you are aware Secretary Gates and Secretary Bodman, who was at [the Department of] Energy going back in 2009, basically observed we no longer have production capabilities for a nuclear weapon, and that is an area where if you really wanted to go back into that business, you would have to start over again.

Mr. CHAO. One quick comment. As long as we have a requirements and acquisition system that takes 20, 25 years to get something from concept to actually out in the field, you are going to have always a fundamental disconnect between strategy and what we are buying. I mean, in 1900 they were planning against the war against, you know, the Germans or the French or the Brits potentially, by 1920, right, we had just fought the Germans, by 1940 fighting them again, by 1960 it is the Russians, by 1980 they are at the top, by 2000 it is four guys in an airplane, by 2020, to your question, Ms. Hanabusa, I mean, who knows? And so shrinking, looking at the, again in terms of your reform efforts, looking at shortening that cycle can only be a good thing from the perspective of getting that mismatch out of the way, and oh, by the way, shorter cycle, which means more points of competition, more programs is very healthy for an industry. One program every 20 years is really unhealthy for an industry.

Mr. SHUSTER. Would you repeat the last thing you said? I couldn't hear it. Just the last couple sentences.

Mr. CHAO. One program, if I am running one program for 20 years, that is very unhealthy for an industry versus, you know, versus not. I mean, this whole element of how long it takes us to get a weapons system is really one of these core root cause elements, and we solved part of that problem in the way we did acquisition for the war because it created a really quick pull, and we had very quick turns, right? And so we will have a healthy base related to that. It is the other part of the system which you guys are looking at from a reform standpoint, I think that is part of the fundamental issue.

Mr. DOWNEY. Quick comment, Mr. West. I think, as an old soldier myself, I sympathize with your frustrations, I had them as well. One thing that personally I would be leery to do is predict too precisely who we are going to fight, where we are going to fight, with what we are going to fight, and when we are going to do it. Historically we have always been wrong when we have done that too much. So part of the problem, I think, is retaining the capability we need. We are not going to end up buying everything that is wanted or designed, but when the system gets to the point that

you described, the possibility is we won't buy much of anything, as Pierre said, and the capability to do that will atrophy and migrate away, and we are just not going to be able to reconstitute some of that. Some of it will be very expensive, some of it may not be recoverable at all.

Mr. WEST. Thank you, Mr. Chairman. I yield back.

Mr. SHUSTER. Thank you. Ms. Sutton.

Ms. SUTTON. Thank you, Mr. Chairman. Thank you for your leadership, and to the ranking member, thank you as well. Gentlemen, thank you for your testimony. I have great concern, as I am sure everyone here does, of the consequences of the atrophy that you describe. I tend to believe that if you can't make it, you are at the mercy of those who can, which is not a good place for the United States of America to be. This is so, so very, very important.

Mr. Downey, on page 5 of your testimony you talk about other nations, including our closest allies, comprehend these realities, and thus they have adopted systematic comprehensive policies to sustain what they consider to be strategic national assets. Can you expand on that for me, tell me who and what?

Mr. DOWNEY. Yeah. Most major industrial nations do have an industrial base strategy for their defense. I wouldn't go so far as to say it is exceedingly successful and effective in all cases, but France does, United Kingdom does, Germany does, I believe China does, but the key that they tend to focus on is what capabilities from a national standpoint they want to retain. They don't always get it right, but at least it is part of their process.

The British have the process of the defense white paper system, which includes defense white papers. We do not include industrial base considerations in our strategic planning historically. In the most recent QDR there was exactly one paragraph about industrial base, and nobody in the industrial base that I am aware of participated in even developing that one paragraph, let alone a strategy. Yet I sat in a meeting in London a couple of years ago where the then British Defense Minister met with the senior leaders of the British defense industry and outlined where he was going to go, saying that he had heard their concerns and that he was going to take care of part of that by including in the strategy an effective outreach program for foreign sales. Now, that may not be a complete strategy, but it is at least a somewhat coherent one, and one which we don't have as a coherent one.

Ms. SUTTON. Well, I appreciate your answer. There are so many questions. Let me ask you this: I mean, clearly I think that maintaining a stable and strong and nimble industrial policy is critically important. You talked about the need for the strategic plan. I think the second component that you really focused in on was communication, and if you could just speak to the need for much better communication and coordination between the Pentagon and industry than has been our historical norm, in a nutshell, what do we do?

Mr. DOWNEY. Yeah, in a nutshell, as I said, historically we haven't done much of it for almost a 10-year period. During the first decade, to my knowledge, there wasn't one meeting between the Secretary of Defense and the collective leaders of the U.S. aerospace and defense industry. That has been turned around. Former

Secretary Gates and current Secretary Panetta has begun to meet with the leaders of the aerospace and defense industry, and the industry has reciprocated by forming an industrial base task force to look at the impacts with the hope that we can help the Pentagon if they so choose, but it is—even if they develop an industrial base strategy, if they do it without industry, it would be like having a naval strategy without talking to the Chief of Naval Operations.

Ms. SUTTON. Well, the one question I have, as you talk about the—even if all of those improvements take place, if we make progress there, we still have the issue that this panel has seen over and over again dealing with the communication into smaller and midsize providers, so can you speak to that issue as well? Because when you say industry, I am guessing you are not talking about them, you are talking about—

Mr. DOWNEY. No—

Ms. SUTTON. You are talking about—

Mr. DOWNEY. I am. And as a matter of fact, in our association, for example, we have a supplier management council that includes members of the supply base and that is represented on our executive committee by one of their leaders, currently Chuck Gray from a small company. So their considerations are included in all of the work that we do and all of the advocacy we do with the Pentagon and elsewhere.

Mr. SHUSTER. If you have further questions, we will start the second round with you right now.

Ms. SUTTON. That would be great.

Mr. SHUSTER. Sure.

Ms. SUTTON. Thank you very much, Mr. Chairman. When you talk about the—you specifically mentioned some capabilities that you see atrophying from the heavy-lift capability, the satellite capability, and the manned space capabilities. Part of the challenge I face and maybe others do is how do you quantify what that means to us?

Mr. DOWNEY. Well, we are working on trying to get a better handle on the impacts. One thing we do know, the first part of that life cycle that begins to atrophy is the design capability. As a program matures, the company who is making the product has less and less need for the people who do design, and so if they don't have other places to put them or other programs that require design, then they are going to get rid of them, and there are a number of design teams that have been reduced or that have actually been disbanded because there is no work for them, and it goes back to which ones do we not want to have that happen to. I would probably suggest that right now we wouldn't want to lose our capability to design a nuclear submarine. The British went down that road and found they couldn't reconstitute that capability, and about a dozen years later they decided they needed it. And so I would hope the Pentagon is looking at that much more carefully to decide which of those capabilities and which of the skills represented by the people that may be lost if the budget is decremented too much they absolutely have to have and then come up with plans to do it, and in some cases that may not seem the most cost-effective thing, program by program, but on a national security basis it might be the most cost-effective thing to do.

Ms. SUTTON. Well, I share the frustration over the idea that every expenditure—it is interesting what we are seeing in budgeting here, that anything that doesn't appear as an expenditure is obviously an efficiency, and that isn't necessarily the truth, and so this whole concept of life cycles and the cost of not investing, the cost of not doing things, and I think that that is what we really need to help translate in order to get some more sense back into the way we are proceeding, not just in this, you know, in the industrial base and certainly DOD, but frankly infrastructure, the cost of not building infrastructure is not zero. It is still there, and it is going to maybe be more costly and more inefficient. So anybody else have any comment?

Mr. CHAO. I am just going to make a comment to your question, in the absence of a defense industrial strategy, we are actually making one up by every acquisition decision we make.

Ms. SUTTON. Exactly.

Mr. CHAO. It is getting done, so we should stop lying to ourselves and admit that we are doing it and get to it. Because also in the absence of that strategy, and I will say something incendiary that will probably get me into trouble, but, you know, in the absence of figuring out what is strategically important to us, we focus on very strange things, so I have a very detailed industrial base strategy related to black berets, but I don't have one related to semiconductors.

Ms. SUTTON. Right.

Mr. CHAO. And the Chinese have set up a policy where they are drawing in every technology where it would almost be fiducially irresponsible for an executive not to put their plant into China, right, because of the incentives they set up, and we are letting it drift away. And so I think you are hitting on exactly the right point about what is strategically important, and if we don't get to it, we are going to find out that that capability is gone.

Mr. WATTS. If I could just add to that, in the kind of fiscal environment that the Pentagon faces now and the Department of Homeland Security and other parts of the U.S. Government, the tendency is to start focusing on individual programs and sort of addressing the question of, well, how much can I cut this one, can I eliminate that one? And it seems to me from a strategic standpoint, you first want to decide what you really want to keep, and we haven't been doing very well at that.

Just to touch on the point that Mr. West mentioned earlier, if you look at the last three or four or five national security strategy documents, they tend fundamentally, in my judgment, to be wish lists without getting on to the difficult issues of exactly how are we going to get from point A to point C or point D, and so I think they have not been that helpful in addressing these kinds of issues about what we want to keep.

Ms. SUTTON. Thank you.

Mr. SHUSTER. Thank you. Mr. West.

Mr. WEST. Thank you, Mr. Chairman. Coming back to what we talked about with the acquisition cycles, you know, one of the things that I know that the Army has instituted is something called the Rapid Equipping Force. A good buddy of mine is heading that up. So what are your recommendations, things that we can

look at, things that we could do, things that we could push for coming from this panel and from the Armed Services Committee as far as how do we shorten that acquisition cycle and how do we get more of these emerging technologies and companies involved so that we can be a bit more adaptive because the soldiers, sailors, airmen, marines are quite adaptive on the battlefield, but it seems that we up here on this aspect and in industry, we are not as quickly responding and as adaptive.

Mr. CHAO. You hit a great topic. We have painfully learned those lessons over the last decade. One of the biggest things I think you need to watch as a group is the tendency that once we are gone to have forgotten those lessons. In fact, 200 years of history says we will forget those lessons and go back to our old habits, and so one of the key things we can do is how do you embed those hard lessons learned into the system and do that? Because there is a basic presumption that in some ways there is a barbell-shaped market. One part of the market or of the industry that is tied to this fight of today, very rapid acquisition, leveraging commercial technologies, I am fighting against guys with box cutters and spending \$10 million developing a device is not a smart thing. The troops know how to do that.

There is the other end where it is near-peer adversary and I do need these traditional players to do that, how can I get them to move a little bit faster and cross-pollinate? Again, don't extend the lessons too far in either direction, but the number one thing I think we can do is make sure that the mentality that is adopted there gets shifted into the core process where appropriate, particularly related to some of these new technologies where you need the fast turns. Think of how obsolete the technology is inside some of those long 25-year platforms we just talked about.

Mr. DOWNEY. I am not sure there is a whole lot of new ideas on that. Most of them have been identified and articulated, number one, decide what we want, lock down the requirement, and build to the requirement, preferably do that with some cooperation between those who need it and those who are going to build it, and reduce the impediments to building it and doing it quickly and without excessive cost, and we know what a lot of those are; excessive oversight, excessive paperwork, excessive and nonmaterial audits. I had one of our CEOs [chief executive officers] that told me that he had a program that had ended over 3 years before. The auditors showed up, three people—

Mr. SHUSTER. Mr. Downey, would you suspend for a second. I have a little difficulty here. I don't want to miss what you are saying.

Mr. DOWNEY. Sorry, Mr. Chairman. That he had a program with the Pentagon that had been completed about 3 years before. There were only a handful of people who were actually on that program, and the auditors showed up. There were actually more auditors than had ever worked on the program, and he had to go out and hire some accounting people on the back end. Now that is cost, you know, and that is going back in the system. So Ben Rich, who was the head of the fabled "Skunk Works," pointed out in his book that over his tenure the oversight and paperwork had increased to the point that in his words we put more and more into the big end to

the final to get less and less out the small end, and it just got worse and worse, and he wrote that in 1994, so you can imagine what it is like at this point.

Mr. WATTS. Back in 2006 General Kadish, when he retired, did an acquisition assessment, and one of the recommendations in that report was something called “time-certain acquisition” where you set a 4- or 5-year hard [stop], you either deliver the product by then or the program is canceled kind of an approach. I understand that when they did the outside look at the last QDR, General Larry Welch was involved in that. He has a lot of acquisition experience, and essentially made the same recommendation. You will find it in Gansler’s book, you will find it in our report. The caveat that goes with that, of course, is you have to ruthlessly adhere to the time-certain delivery schedules and not sit there towards the end of the program as it is starting to slip in terms of schedule, and cost is going up, and decide, well, we spent all that money, so we can’t afford to actually cut it off. That is a very difficult thing, as I am sure all of you know in terms of listening to industry constituents from your States.

Lastly, I will just mention, you know, to touch on what Fred talked about, about the oversight, I recently talked to some people from one of the major contractors where they had a product—it had originally been built for one of the services, and now they were starting to sell commercial versions of it, and the difference in oversight at government contractor oversight of the program actually in the factory was the difference between 5 or 6 on the commercial side and 100-plus on the government side, and as Fred correctly said, that is cost. There is just no doubt about it. It also makes schedules slip.

Mr. WEST. Thank you, Mr. Chairman. I yield back.

Mr. SHUSTER. Thank you. Ms. Hanabusa.

Ms. HANABUSA. Thank you, Mr. Chair. Mr. Chao—and by the way, gentlemen, I still want your writing to my last line of questions, I want it in writing your responses.

But Mr. Chao, let’s move on. I like your concept of policy by acquisition. I think that is a great way of putting it, and that is probably what we are doing. I also went over your sort of your slide show, and what caught my eye was, of course, the second page that says a few ways to think of industrial policy affairs. One of the things in here that causes me somewhat concern, and I would like to go over it with you, you talk about the life cycle of technology industry sectors, and it is this curve that ends up with stability decline, and you have all these other things on the bottom, and it basically points to fewer competition, and that is really the purpose of, I think, this committee. We were looking at as we began to look at the cuts in the defense budget, we were actually more concentrating on small and medium-sized businesses because the big guys will, as your chart in here shows, they practically have everything else. But this is troubling to me because what you seem to be saying is that we are just headed for fewer competitors and we are headed for some kind of decline. Am I reading your chart correctly?

Mr. CHAO. You are from a technological standpoint to the extent that every industry runs through its normal cycle, and the commercial industry runs through it much faster, and the cycle gets re-

started. There is a part of the curve that reboots the cycle, and so if you want to be harsh about it, the technologies we are most stressed about—aircraft, space launch, shipbuilding—those are technologies of the 1910s, 1920s, right? Now, the difference between the commercial world and defense is actually we still use those technologies. So that decline phase goes on for a very long period, which is why—or I would call it stability in terms of maturity of technology, and so all it says is that the policies and things you want to focus in on are different. That is going to be a negotiated relationship with that because of the age of those technologies there will naturally be fewer competitors, period, full stop.

Ms. HANABUSA. But if we put the policy by acquisition and overlay that—

Mr. CHAO. Right.

Ms. HANABUSA. We also seem to be saying that because we are continuing maintaining those old technologies of 1910 of which, as you are saying, we may put a new coat of paint or we may beef it up a little bit, but we are seemingly then doing what you are kind of guarding or telling us to guard against, which is we are maintaining the old technologies because we, by doing that, we are making, we are setting the policy through our acquisitions.

Mr. CHAO. And in some cases you should because they are still very valid technologies. So to date no one has yet sort of come up with a substitute for the submarine, right?

Ms. HANABUSA. Right.

Mr. CHAO. And so it is a core capability set. No one has come up with a substitute for, again, the heavy space launch. You have some guys who are trying to do that. And that is why I think as you look at this, and to Mr. Downey's point and Mr. Watts' point, you know, it is where you should be spending your time because it is going to be the thorniest problems of how do I keep these capabilities alive while at the same time you should be spending R&D money. We should be encouraging the young innovators to see who is going to come up with an answer for that because I guarantee you something, if we don't, the adversaries will. They don't have \$700 billion to spend on sustaining that base. They are trying to solve the exact same problem at one-tenth the cost and, guess what? That forces them to be really innovative, which is why they come up with box cutters or they come up with drones or others.

Ms. HANABUSA. While I still have you, the barbell, which is what you were mentioning I think in relationship to Congressman West, you have it also in your handout. I am trying to understand slice one and slice two, and if you can do that very quickly for me.

Mr. CHAO. Yeah, it is just two different ways of looking at it. So one way is to think about it from the dynamics of the left-hand side of the barbell which is tied to the fight of today. It is very much again pulling technologies off the shelf, think of the MRAP [Mine Resistant Ambush Protected vehicle], think of those technologies. In fact, back to the ITAR issue, three or four of the five designs were overseas designs, right? That was able to pull the more traditional side of it is our old stately system of acquisition that we know and love and sort of, you know, moves along. That is one way of thinking about it.

The other way of thinking about it also is from the types of companies. The smaller, younger, more innovative ones are the ones that we have found that have been taking advantage of [the] rapid acquisition system. I am not going to give the creation of the building of FCS or the GIG [Global Information Grid] or large networks or F-22 to a small start-up. It is just not the right scale and appropriateness. So you need both ends.

The biggest dilemma for the companies themselves is can they operate on both ends of the barbell or not, right? And so that is what they are struggling with and they are beginning to question that once the war is over will the left-hand side of the barbell live anymore? I would submit to you SOCOM [Special Operations Command] lives in that world all the time, the Intelligence Community lives in that world all the time, so there is an enduring market.

Ms. HANABUSA. Thank you. Thank you very much. Thank you, Mr. Chair.

Mr. SHUSTER. Thank you. You mentioned about the MRAP, and I got to know a Special Forces colonel, he is not a colonel now, he is a general now, but he was in Somalia, and he talked about they had in Somalia deployed some up-armored vehicles, I don't know which country, South Africa or somewhere, and he came back after Somalia and said we need these if we ever go into an urban environment again. Well, you know, we just pooh-poohed that, and then we had the situation in Iraq and we should have learned from that, but going back to the point we don't predict very well what we are going to be doing, and I guess we don't listen to people that have been actually in those situations and know what they are talking about.

You had mentioned earlier that Secretary Panetta and Secretary Gates had started to engage at least the large defense contractors. Is DOD doing anything, in your view, sufficient enough to reach down to the mid-level and smaller companies to engage with them in some kind of dialogue? Can you talk about that a little bit?

Mr. CHAO. It is harder. There are things like the Mentor-Protégé programs that, you know, I find useful. It is back to the other entities who sort of are tasked to do that like DARPA that has been reaching, but in dealing with those companies, that has been one of their biggest frustrations has been they don't even begin to know where to start, how to interface, how to, you know, how to begin to get in. They would love to have an ombudsman or somebody that could, you know, be their champion. They look to the small business sort of advocates, you know, to do that. As you know, some groups are better than others in terms of following that. It is a perpetual sort of grinding of the gears.

Mr. SHUSTER. That would be something you would recommend for us to look at?

Mr. CHAO. Yeah.

Mr. SHUSTER. Having somebody in there that is looking out for the smaller guys more aggressively? I guess there is an office at DOD that is supposed to be doing that, and we are going to have them in front of us, but I get the sense that they don't have too many resources behind them to be able to do that.

Mr. CHAO. There is, and then again the thing to be careful about is setting, you know, the small business set-asides which I under-

stand is part of a policy also has sometimes some unintended consequences, right?

Mr. SHUSTER. Right.

Mr. CHAO. There are companies that have loved sticking within that and don't want to graduate because once you graduate you are in the maelstrom, and that is not quite what we want them to do. We want them to use that to get to a certain level, then graduate to the mid tier without having to sell out, and so we also have to be very vigilant about these one-size-fits-all things.

Mr. SHUSTER. Mr. Downey.

Mr. DOWNEY. I think they are, and I think your witness in the coming hearing will be able to talk to a lot of that. One of the problems is the Pentagon actually coming up with an inventory of who the aerospace and defense industrial base suppliers actually are. We don't really have an inventory. The OEMs [original equipment manufacturers], the large producers have a pretty good handle on what their supply chain is, but there is not much of a horizontal, so Brett Lambert, who is the Deputy Assistant Secretary, does have a program that they have been implementing, but there are a lot of them, I think 25,000 suppliers is kind of a guesstimate.

Mr. CHAO. 97,500.

Mr. DOWNEY. 97,500.

Mr. CHAO. Essentially everybody.

Mr. DOWNEY. And so that is pretty hard. My own personal opinion is you should look at it. Doing business with the Pentagon is difficult, intimidating, and for small companies darn near impossible. To have the lawyers, accountants, and advocates that are necessary to understand the Federal Acquisition Regulations and operate successfully without penalty in that world scares away a lot of people and is scaring some of the people who are actually doing it now out of the business, and I think if we don't get a handle on that we are going to lose capability that we wish we had.

Mr. SHUSTER. Right. Mr. Watts, any comments?

Mr. WATTS. Well, I just touch on the ITAR's kinds of constraints on being able to access the global defense industry is, really is a significant constraint these days. And the specialty metals thing came back in Iraq when people had started running into IEDs [improvised explosive devices], you had Humvees that were not armored. You could get access to additional armor to add to the Humvees in country, but that ran into the very amendment kinds of restrictions which sort of said to people really if you are going to follow the rules and regulations you are going to have to go all the way back to the United States to get armor plate that is available locally. I mean, these kinds of constraints I think in that particular case probably led to some people dying, and, you know, those kinds of constraints it just seems to me we do need to do something about.

Mr. SHUSTER. And one final question. What role, what is the appropriate role for the industry to work with DOD to assessing the health of the structure, you know, as we move forward? What is the role of industry?

Mr. WATTS. DOD is going to supply an awful lot of the data that the Pentagon doesn't have, for a starter, and, you know, the more you can get the companies to work as a team with the Defense De-

partment or Homeland Security I think the better off you are going to be.

Mr. SHUSTER. Do we have enough laws in place, in your view, that stop us from doing that, keeping these, you know, arm's length instead of bringing them in and being a part of the team?

Mr. WATTS. I go back to a program that in my industry days I was really familiar with, the B-2 bomber, which is not everybody's favorite acquisition for a variety of reasons, including the unit cost at the end of the program, but that program was eventually won by Northrop [Grumman]. The competitor was Lockheed [Martin], who had built the F-117, and the Air Force basically wanted a high flyer, it was going to be a high-altitude penetrator, period, end of story. Two years or so into the program, the Air Force changed their mind, wanted low-altitude penetration, and as I discussed with some of the staffers for the panel a couple weeks back, that required a major wing redesign except the airplane was a flying wing. You imposed a lot of cost and a lot of delay by having essentially requirements creep in that particular program. We haven't talked too much about the requirements process, but that is another piece of this whole system which, in my view, could use a lot more coherence and discipline.

Mr. SHUSTER. Mr. Downey.

Mr. DOWNEY. Mr. Chairman, there are in fact impediments to adequate cooperation. Some of those are cultural, some of them are institutional, some of them fall into the category of laws and regulations, and some of them are absolutely correct. At some level you do have competition and you do have a need to protect proprietary information on both sides, but increasingly industry views the relationship, and I am not talking about just in the last few months or even the last couple years, as increasingly adversarial. Witness the most recent letter out of the administration that would tighten or reduce the ability of military officers to participate in widely attended events, and so you end up with the problem of what is intended, what is written, what is interpreted, and when you get down into the organization, it is just an awful lot easier to avoid the whole thing than defend yourself or try to explain it later.

Mr. SHUSTER. And I think it is a terrible problem. They don't even want people to talk to people, and when it is completely appropriate and necessary. Mr. Chao.

Mr. CHAO. It is a huge issue, and it is politically difficult and hard to raise, and it is another one where it is creating a really unintended consequence. If I can't talk to people and I can't sort of get basic information, so what happens? You are then forced to recruit retiring military people because that is the only way you get to understand what is going on inside, which then raises the specter of the issue of what is going on, and so I tighten laws about that, and then I get even more and more removed every step of the way until the point where I can't talk to my basic customer in order to understand what is going on. And that then has second-order consequences. But to sit there and say I want to speed up the revolving door is political suicide, and so it is a topic that we don't really touch at. But again, I think you are touching on one of these core fundamental issues. If you can figure out a way to gently look at the issue, I would really encourage you to do so.

Mr. SHUSTER. That is what we hope to, but that brings us right back to what Mr. Watts started out saying, this is not a free market system because in the free market system you go to the customer, and say what do you want? Explain it to me, and I will try to come up with something that satisfies your needs. So it brings us right around, and that is one of the things we need to explore because we know it is a big problem.

Again, I want to thank all of you for giving up your time today and your expertise. I am sure as we move forward, Ms. Hanabusa, I think she has some questions, and we may have questions further that hopefully we can talk to you and get your input because I had—just in this room a couple weeks ago we had a meeting with former Secretary Rumsfeld, and I said we had this panel and, you know, what do you see at the Department of Defense? He looked at me and smiled and he said, if I was advising a small business, I would tell them, don't do business with DOD, he said it is too difficult. His quote, his comparison was it is like sleeping with a hippopotamus. Eventually it is going to roll over and crush you, and it will never know it did it to you. So it was a very concerning comment, but I am not willing to take that point that I think it is critical. And he did say also that a lot of the great ideas, I mean if not all the great ideas, the new technologies are coming from small and medium-sized companies that are nimble, but he said it is so difficult. So that is what hopefully we are tasked here, and we will come up with some solutions to change that, to change the culture, to change the laws and make sure that those small and medium-sized companies continue to be a very important and—very important part of the new technologies that emerge to protect our warfighters and our Nation.

So, again, thank you all very much for being here, and we have a field hearing Friday in Akron, Ohio. Looking forward to it. I have a list here. You have got a number of companies, so I'm looking forward to that. As we go to Ohio on Friday I hope all our members or most of our members can join us. Again, thank you very much, and this hearing is adjourned.

[Whereupon, at 4:37 p.m., the panel was adjourned.]

A P P E N D I X

OCTOBER 24, 2011

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

OCTOBER 24, 2011

**Statement by Chairman Bill Shuster,
Panel on Business Challenges within the Defense Industry
Hearing on
“The Defense Industrial Base: A National Security Imperative”
October 24, 2011**

Good afternoon. I would like to thank everyone for joining us today for what I believe will serve to be a foundational discussion for this panel as it moves forward in its work examining the challenges to doing business with the Department of Defense. The House Armed Services Committee has led the way in improving how DOD develops and buys the equipment it needs. As most of you know, the HASC successfully shepherded a substantial reform effort — the Weapon Systems Acquisition Reform Act — through the legislative process and to the President’s desk.

While that bill did much to garner efficiency, increase transparency, and foster competition, there is still room for improving DOD’s business practices. I’m a strong believer in the fact that you can’t solve the problem without looking at both sides of the equation. That is exactly why Chairman McKeon and Ranking Member Smith established this panel — to look at the business side of the DOD acquisition system.

I wanted to start this series of hearings with a broad look at the defense industrial base to give the panel a clear framework for moving forward. Today we have well-recognized leaders in public policy regarding the defense industrial base joining us. On November 1, we’ll follow-up with senior officials from DOD’s Manufacturing and Industrial Base Policy Office and Small Business Office to give us their views on the issues.

After that, we’ll move on to several hearings focused on some of the specific issues and challenges facing businesses that are eager to provide technologies and services to support our warfighters.

We have some terrific witnesses with us today and I’m very grateful that they have taken the time to share their insights and expertise on the Defense Industrial Base with the panel.

I’d like to introduce:

Barry Watts,
Senior Fellow
Center for Strategic and Budgetary Assessments

Fred Downey
Vice President, National Security
Aerospace Industries Association

Pierre Chao,
Senior Associate, International Security Program
Center for Strategic and International Studies

Gentlemen — thank you for being here today.

I also want to take a minute to thank Mr. Schilling and Mr. Loeb sack — and their hardworking staffs — for hosting the Panel in the Quad Cities area of Illinois and Iowa. We had very informative discussion with industry leadership and learned a great deal about all that goes on at the Rock Island Arsenal. It was an extremely useful trip and I appreciate all the effort that went into it. I also want to thank Black Hawk College for letting us use their facility to hold the meeting.

The committee staff prepared a summary of the discussion with industry at Rock Island and it was provided to all the panel members. Without objection, I'd like to enter that memo in the record.

Hearing no objection, it is so ordered.

On Friday, members of the panel will travel to Akron, Ohio, to hear from the industrial base in that area and to meet with engineers and scientists at the University of Akron who are engaged in efforts to help DOD prevent and mitigate corrosion. In these tough economic times we've got to make sure we're doing everything we can to get the most out of every piece of equipment we ask the American taxpayer to provide. Mitigating and preventing corrosion is a critical part of doing so. I'm very much looking forward to the trip and the discussion on developing and transition critical technologies to help DOD sustain its equipment. Thanks to Ms. Sutton for inviting us to her district.

With that, I turn to my good friend from Everett, Washington, Mr. Larsen, for any remarks he might like to make.

**Statement of Hon. Rick Larsen, Ranking Member,
Panel on Business Challenges within the Defense Industry
The Defense Industrial Base: A National Security Imperative
October 24, 2011**

Thank you, Mr. Chairman. I'm pleased to be joining you and the other panel members here today.

I concur with the Chairman's opening remarks regarding the need to ensure a healthy defense industrial base.

As we continue to face dynamic and complex 21st century threats, it is imperative that we take a hard look at our 20th century industrial base currently serving the Department of Defense and transform it to meet our overall national security needs.

This will require a strong government-industry partnership.

Several factors challenge the current government-defense industry partnership and capabilities they produce.

Changes in security threats, a tough budget environment, technology, and industry globalization are a few of the challenges facing our defense industrial base.

This Panel, as mentioned before aims to discover and ultimately address these and other factors.

I am pleased with what we've learned so far from our first Panel hearing that looked at challenges our small- and medium-sized businesses are having creating and maintaining opportunities with the Department of Defense.

Small businesses are essential to a robust and agile industrial base as well as for a strong economy.

The U.S. defense base has a long history of producing the best military systems in the world.

We must ensure that this continues—both for our warfighter and because it creates jobs here in America.

Testimony from the hearing was echoed during our district visits and roundtable discussions.

In addition, comments from local leaders have been extremely helpful.

We visited Rock Island Arsenal earlier this month in Mr. Schilling's district and later this week, I and other Panel Members look forward to meeting with industry leaders in and around Ms. Sutton's Akron, Ohio, district.

Today's hearing focuses on the broader defense industrial base (DIB) and their future role in supporting our defense needs.

I thank our witnesses for their participation today and ask that they provide the Members a brief overview of how our current government-defense industry relationship operates.

Has the DIB partnership evolved with the dynamic and changing 21st century environment? What are some of the broad challenges facing the DIB? What are their recommendations for government and industry to support transforming our industrial capabilities?

I look forward to hearing today's testimony.

Thank you again, Mr. Chairman.

**Statement of
Barry Watts
Senior Fellow
Center for Strategic and Budgetary Assessments
Before the House Armed Services Committee
October 24, 2011**

Chairman Shuster, Mr. Larsen, and Members of the Defense Business Panel, thank you for inviting me to testify at today's hearing on the imperative to preserve essential elements of U.S. defense industrial base.

As you are aware, I and my CSBA colleague Todd Harrison recently published a report on the challenge of sustaining the most critical components of the U.S. defense industrial base (DIB). This report focused on the need to develop a coherent, long-term government strategy for sustaining design and production capabilities in a small number (less than ten) of areas critical to meeting the principal challenges to American national security during the next couple decades.

I should point out that our analysis was based on examining major defense acquisition programs and first-tier or "prime" suppliers. We did not delve into lower-tier subcontractors, materials suppliers or the services aspects of the DIB. Nor did we address, as Jacques Gansler has done in his 2011 book, *Democracy's Arsenal*, regulatory constraints affecting the DIB—particularly the International Traffic in Arms Regulations (ITAR) or the "special metals" restrictions in Title 10 of U.S. Code that grew out of the Berry Amendment.

The Nature of the U.S. Defense Industrial Base

Before discussing the prospects for developing a strategy that will preserve the few truly critical elements of America's arsenal, it is important to understand what sort of an economic enterprise the defense industrial base is. In the Department of Defense's September 2011 report to Congress on the defense industry, the Office of Manufacturing & Industrial Base Policy (MIBP) stated that maintaining a "strong, technologically vibrant, and financially successful defense industry is . . . in the national interest." I wholeheartedly agree. As Norm Augustine, the former chief executive officer of Lockheed Martin, has observed, the U.S. defense industry helped to win the Cold War and has produced weaponry and equipment that have been the envy of the world's militaries. I believe that a healthy defense industrial base will continue to be a source of strategic advantage for the United States in the decades ahead.

Nevertheless, the prospects for the continued success of for-profit defense firms in providing the U.S. armed forces with superior weaponry and equipment—especially at affordable costs—may be at risk unless both the defense industrial base itself and the business practices of the U.S. government undergo fundamental restructuring. The Department of Defense’s (DoD’s) current approach to the needed transformation is “in the main . . . [to] rely on normal market forces to make the most efficient adjustments to the defense industrial base.”¹ If one assumes that the U.S. defense industry operates like a normal free market with many customers, many suppliers, and price sensitivity driven by competition, then this approach would accord with good economic theory.

However, there is no persuasive evidence for thinking that the U.S. defense industry functions like normal free markets such as consumer electronics or the automobile industry. In reality, the defense industrial base is highly regulated by both DoD and Congress to achieve maximum risk avoidance. Structurally, it is unique in having a monopsony buyer—the U.S. government (which is also the regulator)—and a few oligopoly suppliers in each sector due to the consolidations of the 1990s.²

These facts about the regulation and structure of the U.S. DIB should surprise no one. In their seminal 1962 analysis of the U.S. weapons acquisition process, Merton Peck and Frederick Scherer not only emphasized that the DIB did not function at all like a normal free market, but went on to argue that a market system in its entirety could *never* exist for weapons acquisition.³ The uncertainties and risks inherent in weapons acquisition not only made the defense industry unique, but vitiated the use of free-market concepts such as “competition,” “price,” “buyer,” and “seller.” Consequently, policies or strategies for transforming the U.S. defense industry that assume this sector of the American economy operates like a normal free market fundamentally misunderstands the defense industry’s nature and are unlikely to succeed. As Jacques Gansler pointed out in 1980, this misunderstanding has more often than not proved harmful rather than beneficial

Deciding What To Keep in a Period of Fiscal Austerity

Since the September 11, 2001, attacks on the World Trade Center and the Pentagon (9/11), Congress has authorized over \$1.28 trillion for military and diplomatic operations

¹ Office of Manufacturing and Industrial Based Policy, DoD, “Annual Industrial Capabilities Report to Congress,” September 2011, p. 2.

² Jacques S. Gansler, *Democracy’s Arsenal: Creating a Twenty-First-Century Defense Industry* (Cambridge & London: The MIT Press, 2011), pp. 9, 347, 357.

³ Merton J. Peck and Frederic M. Scherer, *The Weapons Acquisition Process: An Economic Analysis* (Boston, MA: Harvard University, 1962), pp. 57-60.

in Iraq and Afghanistan, enhanced security, and medical care for veterans.⁴ From Fiscal Year (FY) 2001 to FY 2011, the Defense Department's base budget, which excludes supplemental funding for Overseas Contingency Operations (OCO), grew over 40 percent. Including OCO funding, defense spending grew over 70 percent from FY 2001 to FY 2011.

In March 2011, the president's baseline defense budget request for FY 2012 was \$553 billion. The Budget Control Act of 2011 passed on August 2nd reduced the Pentagon's base budget by around \$450 billion over ten years (relative to the president's FY 2012 budget request). If the Joint Committee created by the Budget Control Act cannot agree on another \$1.2 trillion in deficit reduction, or if their recommendations fail to be enacted by Congress, then around half of the deficit-reduction shortfall will be imposed as a further cut to DoD's base budget over the next ten years.⁵

On the one hand, there is considerable uncertainty about what the level of DoD's base budget will be from FY 2013 through FY 2021. On the other hand, in the wake of the financial meltdown in 2008, the subsequent recession in the U.S. economy, and the explosive growth in the federal debt, it is clear that the post-9/11 period of long-term growth in defense budgets is over. Both DoD's base budget and OCO funding are declining, and the Pentagon is now facing a protracted decline in defense spending that could last a decade or longer.

In such circumstances, the natural inclination in both Congress and the Pentagon is to concentrate on identifying individual programs to cut or eliminate. The first question, however, should be not what to cut but what to keep. Given the complex range of security challenges the United States is likely to face over the next couple decades, what are the core capabilities that the Defense Department will need to preserve or create to meet these challenges? For example, the U.S. military has enjoyed a near monopoly on long-range precision strike and the associated reconnaissance and targeting networks. Would it be wise to sacrifice this important area of military capability to defense budget cuts? And if not, what sectors and elements of the defense industrial base should the Defense Department continue investing in preferentially—even at the likely expense of other, less critical portions of the defense industry?

The question of what to keep, rather than what to cut, is the fundamental strategic issue that needs to be given top priority by Congress and the Pentagon in coping with the

⁴ Amy Belasco. "The Cost of Iraq, Afghanistan, and Other Global War on Terror Operations since 9.11," Congressional Research Service, RL33110, March 29, 2011, p. 1.

⁵ Todd Harrison, "Defense Funding in the Budget Control Act of 2011," CSBA Update, August 2011, pp. 2-4.

emerging era of declining defense spending. It is unlikely that a sound strategy for preserving the truly critical elements of the U.S. defense industrial base will emerge, despite the best intentions of all concerned, unless this question is given top priority.

Recall, in this regard, the case of the British Navy's efforts to field a new nuclear-powered attack submarine (SSN). The program to develop and build four *Astute*-class SSNs began in the late 1990s, but some three years into development it became clear that the United Kingdom's defense industry no longer had either the design or production skills to complete the program. Fortunately, the British were able to turn to the Electric Boat division of General Dynamics to provide the missing expertise. But if the United States finds itself in a similar situation in a critical area of defense capability, to whom would the country turn?

A Long-Term Strategy for Sustaining the Critical Elements of the U.S. Defense Industrial Base

Strategies are fundamentally about choice: favoring this over that, especially in terms of resource allocation. Effective strategies rarely, if ever, make every constituency or organization with a stake in the enterprise happy. Among other things, this understanding of strategy means that the number of sectors of the defense industrial base that can be deemed critical or essential cannot be very large. A DIB strategy that seeks to preserve 50 or 75 "critical" sectors and their underlying components cannot be an effective strategy because it avoids making the hard choices that are the essence of strategy. As a rule of thumb, a strategy for preserving the U.S. defense industrial base has little chance of succeeding if the number of critical elements exceeds a single digit. In other words, the total number of critical sectors cannot be more than eight or nine if the inherent demands of effective strategy are to be satisfied. This upper limit seems all the more compelling given the period of fiscal austerity the Pentagon is now facing. Attempting to preserve every sector of defense industry without regard to prioritization would be unaffordable.

Getting Congress, the Office of the Secretary of Defense, the Departments of the Army, Navy and Air Force, and the Marine Corps to agree on such a short list of critical military capabilities and the corresponding elements of the DIB is no easy task. The first step in this direction would be an assessment of the main challenges to American security over the next several decades, remembering that prediction is difficult, especially of the future. The next step would be to link those broad challenges to the critical sectors of the defense industry needed to field the weaponry and capabilities to address these challenges.

However, neither assessing the main challenges to U.S. security nor linking them to the critical sectors of the defense industry is easy. To illustrate the difficulties that would beset any attempt to reach consensus on these matters, consider the question of whether the Defense Department should continue to invest in the kinds of “legacy” high-end capabilities that might be needed to offset China’s growing anti-access/area-denial (A2/AD) capabilities in the western Pacific. *Democracy’s Arsenal* argues that while China is likely to seek dominance in Asia, it will do so “not militarily so much as politically and economically” by focusing “more on the the soft use of power (backed by military strength)” to draw Asian countries into its orbit.⁶ China’s leaders are by no means neglecting these “softer” methods short of war.

That said, *Democracy’s Arsenal* rightly emphasizes the need for balance between high-intensity conventional capabilities and those tailored for less traditional conflicts along the lines of what the British general Rupert Smith has characterized as “war amongst the people.”⁷ Here *Democracy’s Arsenal* emphasizes the fleeting opportunity to negotiate a way out of descending “into a new dark age of anarchy and violence and a new cold war between the United States and China.”⁸ But in light of China’s 2007 demonstration of a kinetic anti-satellite capability and the ongoing build up of the Second Artillery Corps’ conventional and nuclear capabilities, how real is this opportunity? Moreover, even if the United States never fights China and avoids being drawn into a Cold War-like military competition with China, U.S. forces are almost certain to come up against Chinese weaponry—including their A2/AD capabilities—somewhere else in the world.

Finally, even if consensus emerged on the most important threats facing the United States in coming decades, exactly which sectors of the defense industrial base would best (and most affordably) meet them? If a critical challenge is A2/AD capabilities, would the best response lie in hit-to-kill missile defenses, directed energy weapons, facility hardening, long-range strike, a new generation of submersible combatants, changes in operational methods, or some combination of these? Again, not everyone is likely to agree on the answer to the linkage question.

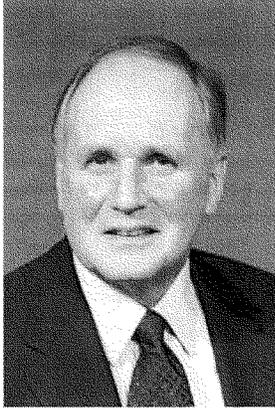
Government decision makers and informed observers of the U.S. defense establishment can—and do—differ over the answers to core questions about America’s future security needs. And without answers, it is unlikely that much bipartisan consensus will be reached on what seven or eight or nine sectors (and underlying elements) of the defense industrial base are truly critical enough to warrant preferential investment. Nevertheless, such

⁶ Gansler, *Democracy’s Arsenal*, p. 88.

⁷ Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (London: Allen Lane, 2005), pp. 4-6, 19-20.

⁸ Gansler, *Democracy’s Arsenal*, p. 89.

choices appear to be unavoidable if the U.S. government is to craft an effective strategy for preserving the vital sectors of the nation's arsenal—especially in the current budgetary environment.



Barry Watts

Biography

Prior to joining CSBA in 2002, Barry Watts headed the Office of Program Analysis and Evaluation at the Defense Department (2001-2002). Following retirement from the Air Force in 1986 until 2001, Mr. Watts directed the Northrop Grumman Analysis Center.

Mr. Watts has written on a wide variety of military topics, including CSBA monographs on Organizing for National Security (2009); The Past and Future of the Defense Industrial Base (2008); US Combat Training, Operational Art, and Strategic Competence: Problems and Opportunities (2008); Six Decades of Guided Munitions and Battle Networks (2007); Long-Range Strike: Imperatives, Urgency and Options (2005); and The Military Use of Space: A Diagnostic Assessment (2001).

He holds a BS in mathematics from the US Air Force Academy and an MA in philosophy from the University of Pittsburgh.

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(4), of the Rules of the U.S. House of Representatives for the 112th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Armed Services Committee in complying with the House rule.

Witness name: Barry Watts, Senior Fellow, Center for Strategic and Budgetary Assessments

Capacity in which appearing: (check one)

Individual

Representative

If appearing in a representative capacity, name of the company, association or other entity being represented: Center for Strategic and Budgetary Assessments (CSBA)

FISCAL YEAR 2011

federal grant(s)/ contracts	federal agency	dollar value	subject(s) of contract or grant
WHS	DoD/ONA	\$1,360,000	Assessments/analysis, wargames, and briefings on international security environment, strategic challenges, future warfare, and portfolio rebalancing.
DARPA/Strategic Assessments	DARPA	\$95,000	Crisis simulation exercise in national security decision making environment
DLA Acquisition Directorate	National Defense University	\$75,000	Secretary of Defense Corporate Fellows Program Orientation

FISCAL YEAR 2010

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
WHS	DoD/ONA	\$3,000,000	Assessments/analysis, wargames, and briefings on international security environment, strategic challenges, future warfare, and portfolio rebalancing.
Department of the Interior	DARPA	\$815,000	Real Time Sensor Simulation: IR Sensor Modeling in Real Time Simulations Study
DLA Acquisition Directorate	National Defense University	\$75,000	Secretary of Defense Corporate Fellows Program Orientation

FISCAL YEAR 2009

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
WHS	DoD/ONA	\$3,000,000	Assessments/analysis, wargames, and briefings on international security environment, strategic challenges, future warfare, and portfolio rebalancing, QDR 10
USAF	DoD	\$250,000	Red Teaming, Analytical and Facilitation support to AF/A8X
CCE	DoD/Office of Force Transformation	\$245,000	Transformation Roadmap Irregular Warfare
US Marine Corps	DoD	\$65,000	External review of Vision and Strategy and other strategy documents

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2011): 3 _____;
 Fiscal year 2010: 3 _____;
 Fiscal year 2009: 4 _____.

Federal agencies with which federal contracts are held:

Current fiscal year (2011): 3 _____;
 Fiscal year 2010: 3 _____;
 Fiscal year 2009: 1 _____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2011): Research and Analysis
 Fiscal year 2010: Research and Analysis
 Fiscal year 2009: Research and Analysis

Aggregate dollar value of federal contracts held:

Current fiscal year (2011): \$1,530,000
 Fiscal year 2010: \$3,900,000
 Fiscal year 2009: \$3,560,000

Federal Grant Information:

CSBA has no grants with the federal Government in 2011, 2010, 2009

Testimony to the House Armed Services Committee
Panel on Business Challenges Within the Defense Industry

By

Frederick M. Downey

Vice President National Security, Aerospace Industries Association

Monday, October 24, 2011

The week of September 12th was National Aerospace Week by Congressional Resolution. During that week we celebrated our legacy of global leadership in aviation, defense and space. In the coming months several momentous decisions will be made about the nation's budget, which will ultimately affect what kind of aerospace and defense industrial base we will have, what capabilities it will possess, and whether or not we will remain the global leaders. Those decisions will be taken in the absence of an industrial base strategy, and if history repeats itself, without full participation of those who must manage the industrial base during what may prove to be a time of tremendous reorganization.

I think most Americans would agree that the 20th Century was defined by aerospace. The Wright Flier opened the first century in human existence when man was able to leave the earth's surface, and indeed the earth itself. That event expanded war to the air, and thus to every person and place on earth. It also led to commercial air travel, which shrunk our planet and fundamentally changed the way humans move, live, and work. The 20th Century was America's century because we were "Second to None" in aerospace.

I believe that the 21st Century will also be defined by aerospace. Fifth, and probably later generation fighters, many probably unmanned, will increase aerospace's central place in fighting wars. Commercial aircraft with new technologies and with new and more efficient ways to control a crowded sky will further define how we travel and do business. And man will go into deep space, with the possibility of important new discoveries. The question is will America be at the forefront of these advances and remain "Second to None" in aerospace in the 21st Century?

Rising competitors, global economics, the national debt, and the threat of catastrophic decline in defense spending threaten the aerospace and defense industrial base that designed and produced these technologically advanced aerospace products. While most accept that the US aerospace and defense industrial base is a national strategic asset, too many choose to treat it with benign neglect, assuming that a free market will always work to ensure we stay "Second to None."

To be sure, there is a reason for this assumption. After World War II, the aerospace and defense sector was America's largest industrial sector. It consumed more than 50% of the US budget and contributed 10% of GDP. Although the industrial base never did operate by free market principles, market forces, mainly competition for a wide range and number of Pentagon programs that promised good, if not spectacular, profits resulted in cutting edge technologies that gave America aerospace dominance for 50 years. In fact, the aerospace industrial base was so successful that many have come to believe that this dominance is an American

birthright, and that the industrial base will continue to provide whatever is desired or needed whenever it is wanted.

But that was then. That aerospace and defense industrial base no longer exists. Today's defense and aerospace industry is a far cry from the "military-industrial complex" of the Eisenhower Era, when it represented the largest single segment of the American economy and fluctuations in the DoD procurement budget had clear macro-economic implications.

In the twenty years since the end of the Cold War, nearly 150 significant defense companies have consolidated to six. From the mid-1980s to 2007, a number of big companies left the defense market altogether, while nearly none entered it. The post-Cold War consolidation has created a situation where the top firms have grown individually via mergers and entry into other markets, but collectively the industry has shrunk significantly. Far from being the revenue powerhouse of 1960, today the largest seven aerospace and defense companies operate in a smaller market and their combined annual revenue is equal to about one-half the annual revenue of Wal-Mart.

They compete for fewer major programs, each with fewer systems, with longer periods of time between new starts. Consider combat aircraft. In 1960, 938 combat aircraft were delivered and about 700,000 people were engaged in building them. In 2010 there were 110 combat aircraft delivered and about 190,000 workers were engaged in building them. In 1960 there were eight combat aircraft in development and ten in production. Today there is only the UCLASS and possibly the long range bomber in development and five combat aircraft in production. It is a more unstable market, where a product considered an urgent "must

have” requirement for one administration, one service chief, or one year’s budget request, can rapidly become an excessive and exquisite “nice to have” for the next.

Despite these changes, many still view the aerospace and defense industrial base as an outsized behemoth. The Pentagon still officially relies on a distorted free market model to maintain an effective aerospace and defense industrial base. As late as last year the Pentagon’s annual industrial base assessment stated that it’s the Pentagon’s policy to rely on market forces to maintain the industrial base. We do not believe that is an effective policy, and when it does not produce the desired outcomes, the Pentagon will likely resort to more reliance on regulations, which will only increase cost.

In reality, over the past 20 years, the defense and aerospace sector has grown ever more remote from being a “free market” in any classical sense. For militarily unique systems it has devolved into a niche industry servicing a highly narrow and technical market:

- A market of one buyer, that is also the regulator and a handful of major sellers that in many cases are required to collaborate with one another;
- A market with many barriers to entry and little in the way of usable and timely information;

The defense sector *is* similar to a typical market in one important sense: firms seeking higher profits and more stable conditions can go elsewhere. Many already have, and more may yet follow.

Other nations, including our closest allies, comprehend these realities and thus they have adopted systematic, comprehensive policies to sustain what they consider to be strategic national assets.

If these trends continue, and the defense budget continues to be cut, the capability to deliver critical militarily unique systems will atrophy, and the capability our troops and the American people expect may not be available. In order to retain the ability to deliver the technology that is expected of us, we must have the capability to design, develop, produce, and support complex systems. Over \$178 billion has been cut from the defense budget so far, and DoD has already cancelled or delayed a large number of programs. According to a recent speech by Secretary Panetta, we will see another \$460 billion in cuts over the next ten years and a significant portion of that will come from procurement.

Further cuts to existing programs coupled with fewer new starts means that the companies that make up the defense industrial base cannot continue to invest in the workforce, plant, and research for programs that may one day be needed. We will see the impact first on our workforce. Our industry has only half the workers it did thirty years ago and has already shed more high skilled jobs in response to the recession and reduction of the national budget for aerospace and defense. Recent analysis performed by Dr. Stephen Fuller with George Mason University and the Center for Regional Analysis together with Economic Modeling Specialists Incorporated shows that the total American job loss of just the first part of the Budget Control Act will be approximately 432,000. If the super committee fails to reach an agreement, or that agreement includes further cuts at the level subject to sequestration, that job loss will increase to just over 1 million American workers. Approximately one third of the

lost jobs will be in the defense industry and our supply chain. The remaining two thirds of lost jobs will be in those areas of the economy such as retail, construction, health care, education and even arts and entertainment. The total reduction to America's economy will be just over \$84 billion annually.

But it's not just jobs we will lose. The industry will lose its most valuable human capital. For generations, some of the most brilliant and ambitious technicians, engineers, and scientists sought out work in the aerospace and defense industry – inspired by the opportunity to work on the most cutting-edge, innovative technology projects. Today, in an economic marketplace infused with technology, the defense industry has to compete with many more sectors for top talent. The combination of fewer programs, shrinking funding, and growing uncertainty about the future already calls into question our ability to attract and retain a workforce of this caliber.

A cohort of scientist, technicians, and engineers with unique expertise in military systems is eligible to retire and is already poised to leave the workforce – up to 50 percent in some companies – and is not being replaced with talent in the numbers or quality needed to allow the U.S. to maintain our critical technology edge. In terms of capability, we will see the impact first in design and development. In its 2010 Industrial Base Report, DoD noted an immediate risk from the atrophy of key design and development capability unique to military needs. Such critical areas include low-observable technology, sophisticated radars, electronic warfare, precision weapons, and complex systems integration – expertise not found in the commercial market, existing largely within the large defense firms.

The U.S. Government has recognized in other areas – most notably, the nuclear weapons infrastructure – that rare and perishable skill sets within a particular work force are strategic assets that should be preserved as a matter of strategy. But the Defense Department has yet to systematically address the urgency of retaining the human capital of its industrial base.

If we are to remain “Second to None” in the 21st Century, we need a sufficient number of sustainable programs with stable funding and requirements. To some extent, the trends I have described here were present to varying degrees for much of the past two decades. The result has led to a difficult but manageable challenge for industry leaders – *remain capable and healthy in a market with fewer companies competing for fewer programs with fewer active production lines*. The challenge will be far more difficult, but we conclude manageable, at the defense budget level recommended by Secretary of Defense Panetta. However, history reveals that the investment accounts—R&D and Procurement—are often the first cut when defense reductions are on the table. Cuts to military modernization are often easier than making the difficult choices about cutting personnel and benefits. However, if we do the same this time we will be likely cut below the level of ongoing and new programs needed to fully sustain an effective industrial base. Our research reveals that our equipment is best in terms of age and capability, and our industrial base is healthiest when the investment accounts are sustained at about 35% of the defense top line.

Defense and aerospace executives, as a matter of fiduciary duty, cannot continue to invest huge sums in skilled workers, technology, and facilities for programs that are being dramatically scaled back, delayed to fit budget limits, or may never come to fruition. If the

defense budget cuts exceed \$460 billion there will be real consequences for our warfighting capability and to the industrial base that supplies our warfighters. More firms could follow the path of Northrop Grumman, which divested its shipbuilding business earlier this year. Some of these consequences may not be reversible.

But sustaining the world's best aerospace and defense industrial base requires more than budgets. We need a real aerospace and defense industrial base strategy to give the direction and predictability that the industry leaders need to make sound strategic business decisions. There are many critical elements to a sound strategy, but two are essential. The first are decisions about what forces and with what capabilities and technology we want now and later with specific plans to get there. The second is much better communication and coordination between the Pentagon and industry than has been our historical norm.

My colleagues on this panel have noted in their work that the Pentagon has largely ignored industrial base considerations during their deliberations about strategic plans. And the resulting products have been short on specific plans and guidance that can be used by industry leaders to make investment decisions. The industrial base of the 20th century was robust enough to react. The 21st century industrial base may not be.

To make a strategy work, there needs to be a more constructive relationship between DoD and industry that includes formal and regular channels of communications between the most senior levels of industry and DoD. The key objectives for industry are clarity, communication about where we need to go, and a plan for what comes next. This plan needs to include dealing with the things that are getting in the way of implementing the strategy. An important aspect is to identify and remove paperwork, process, and regulation from

government employees and military personnel that serves no real purpose. While most of this was intended to save the taxpayers' money, the effect is to add extra layers of delay on top of a procurement process in which a major driver of cost-growth is time.

Ben Rich, the former president of Lockheed's Skunk Works division, reflected on how much has changed in the DoD-industry relationship since his division, with minimal supervision from its corporate or military overseers, developed the U-2, SR-71, and F-117 stealth fighter. He wrote: "Oversight is vitally important, but we are being managed to death and constantly putting more funds and resources into the big end of the funnel to get an ever smaller trickle of useful output from the small end." Rich wrote those words in 1994, and since then, the compliance processes and paperwork have only grown more onerous. The number and variety of programs has since declined sharply, while the amount of regulation and day-to-day inspections has increased, often as a result of new laws from Congress or DoD-driven cost initiatives. Concurrently, despite the new tone being set by top DoD leaders, some government officials seem to have become more adversarial – with a chilling effect on initiative and openness on both sides of the contract relationship. For some aerospace firms, this dynamic –more bureaucratic red-tape for less return on investment – is making it more difficult to justify remaining in the defense sector given the opportunities in other markets that offer more profit and less adversarial interaction with government.

Unfortunately, there have been few ways to address these concerns sensibly at a level where effective action was possible. Between 2001 and 2008 there were no meetings between the Secretary of Defense and the major defense company CEOs as a group. Industry is encouraged that former Secretary Gates and Secretary Panetta have begun to meet with

industry leaders, and Undersecretary Carter has been a strong proponent of this dialogue, taking important steps to institute a creative and effective partnership. But creating a strong partnership rooted in a comprehensive industrial strategy will require major cultural and institutional shifts at DoD, which can come only as a result of a continuing substantive strategic-level dialogue.

Most of the issues I have discussed have been a source of concern and study ever since the end of the Cold War. One commission, which included a former deputy defense secretary and Air Force secretary, assessed the state of the U.S. aerospace industry. It concluded that:

- The nation needed a national aerospace strategy.
- A government-wide framework was required to implement that strategy.
- The administration and congress should level the international playing field for the export market and remove prohibitive legal and regulatory barriers – such as dated export control restrictions – that impeded the sector’s growth.
- U.S. leadership in aerospace could be achieved only by investments in the future -- the industrial base, workforce, long-range research and national infrastructure.

The commission warned: “We stand dangerously close to squandering the advantage bequeathed to us by prior generations of aerospace leaders.” That report was written nearly a decade ago. And even after the post-9/11 spending increases, all of these conclusions, which would apply to the defense industrial sector as a whole beyond aerospace, are as valid today, and addressing them is even more urgent. What is required now is a willingness to cooperate, communicate and make tough choices in a collaborative way about the future.

Fred Downey

Vice President, National Security
Aerospace Industries Association



Fred Downey, Vice President, National Security, is responsible for monitoring and analyzing national security issues that affect the U.S. aerospace industry's ability to support the Defense Department and to compete and cooperate in the national and global marketplace.

Downey also coordinates the activities of the association's National Security and Technical Operations Councils and their associated committees and working groups to develop industry consensus and responses to these issues.

Downey comes to AIA from the office of Sen. Joe Lieberman, where he served as senior counselor and legislative aide for defense and foreign affairs. Downey has been Lieberman's point person on these issues for 12 years. Downey was the senator's designated representative to the Senate Armed Services Committee and staffed him in his role as chair of the Airland Subcommittee. He worked directly on Army and Air Force policy and budget issues and the annual defense authorization bill, among many other assignments.

Prior to joining Lieberman's office, Downey was in the private sector, working on defense program analytical services for TASC Inc. That came after a 24-year career in the U.S. Army, including the Pentagon postings of assistant to the Director of Net Assessments and Strategy Team Chief for the Strategic Plans and Policy Directorate. Downey's Army career included a variety of infantry and armor troop and staff positions in the United States, Europe, the Middle East and Vietnam.

He currently is a member of the Board of Visitors of the US Army War College and the Board of Advisors of the International Studies Department at the Virginia Military Institute.

Downey graduated with honors from the University of Kansas with a Master of Political Science, attended the U.S. Army Command and General Staff College, and received a Bachelor of Arts, Distinguished Military Graduate, from the Virginia Military Institute.

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Witness name: Frederick M. Downey

Capacity in which appearing: (check one)

Individual

Representative

If appearing in a representative capacity, name of the company, association or other entity being represented: Aerospace Industries Association
FISCAL YEAR 2011

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
None			

FISCAL YEAR 2010

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
None			

FISCAL YEAR 2009

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
None			

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2011): _____;
 Fiscal year 2010: _____;
 Fiscal year 2009: _____.

Federal agencies with which federal contracts are held:

Current fiscal year (2011): _____;
 Fiscal year 2010: _____;
 Fiscal year 2009: _____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2011): _____;
 Fiscal year 2010: _____;
 Fiscal year 2009: _____.

Aggregate dollar value of federal contracts held:

Current fiscal year (2011): _____;
 Fiscal year 2010: _____;
 Fiscal year 2009: _____.

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.

Federal agencies with which federal grants are held:

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.

Aggregate dollar value of federal grants held:

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.



**Key Defense-Industrial Policy
Strategy Issues**

House Armed Services Committee

October 24, 2011

**Pierre A. Chao
Senior Associate
pchao@csis.org**



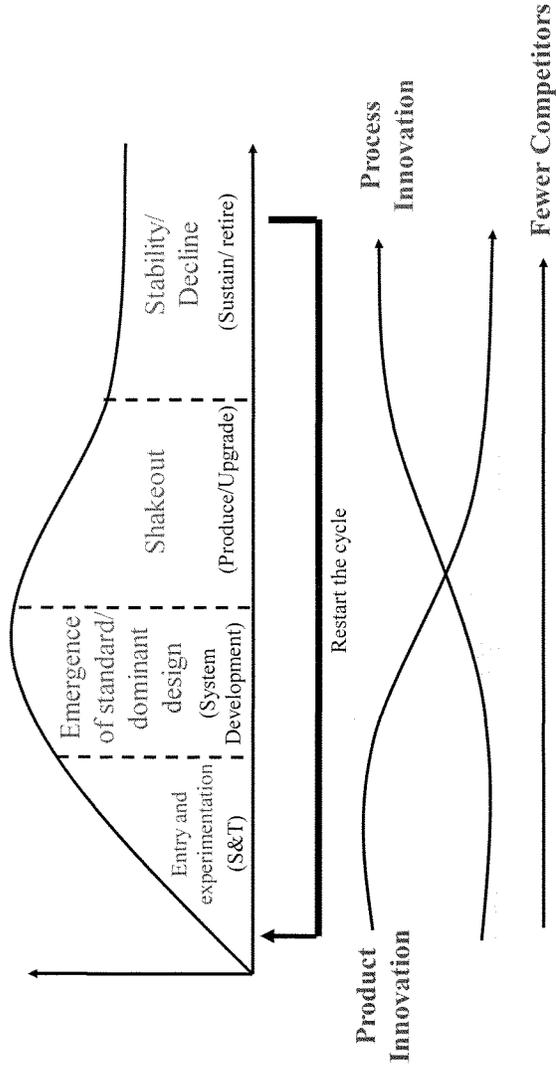
A Few Ways to Think of Industrial ‘Policy’/Affairs



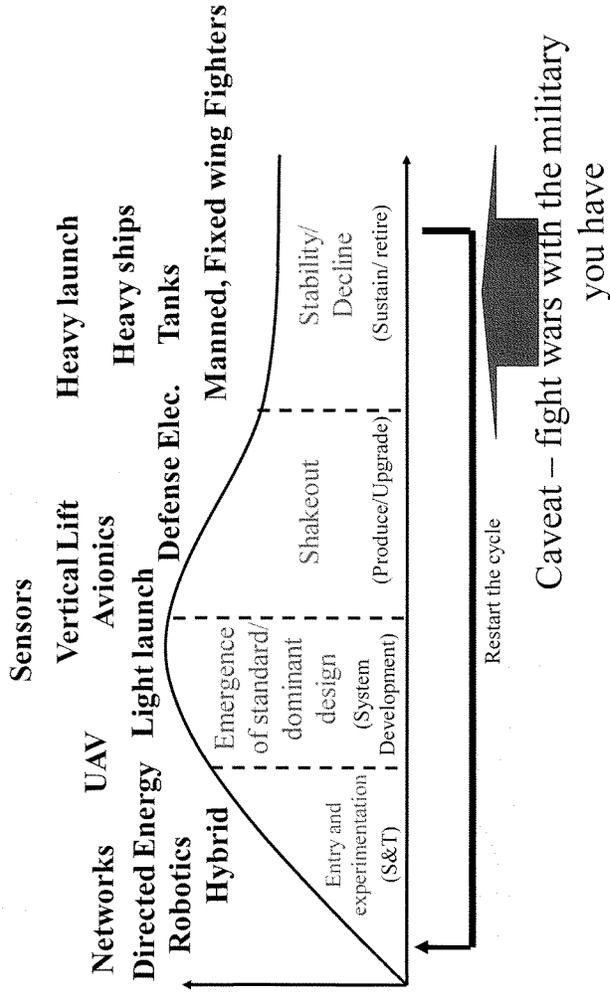
View #1: Defense-Industrial Policy Levers

Policy Aspect	Key Dimensions
Sourcing	<ul style="list-style-type: none"> Assuredness of supply Jobs/"Buy America" Get best technology to warfighter Technology transfers
Innovation/Transformation	<ul style="list-style-type: none"> DoD R&D leadership Source of transformational tech Ability to control research agenda
Allowable sector structures	<ul style="list-style-type: none"> Sector importance/uniqueeness Foreseeable production demands Public cost to keep add'l suppliers
Acquisition Philosophy	<ul style="list-style-type: none"> Service specific vs joint programs Multiple vs fewer program starts Prime/GFE mgmt vs LSI
Acquisition Strategy	<ul style="list-style-type: none"> Cost Sensitive info dissemtn - Nat'l Sec Urgency Sector structure
Business proposition to industry	<ul style="list-style-type: none"> Robustness of defense industry Attracting new entrants Gov't stewardship of public funds

View #2: The Lifecycle of the Technology/Industry Sector...

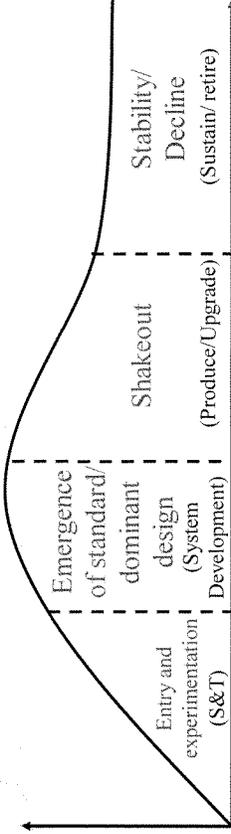


Where You Are in the Lifecycle....





Drives Solutions/Incentive Structures...



Key Actors Gov't, Academia Industry, depot yard, arsenal
 FFRDC, industry (in production)

H.C. Scientists engineers manufacturing support/logistics

Market Dynamic ← Competition → ← Negotiation/partnership →

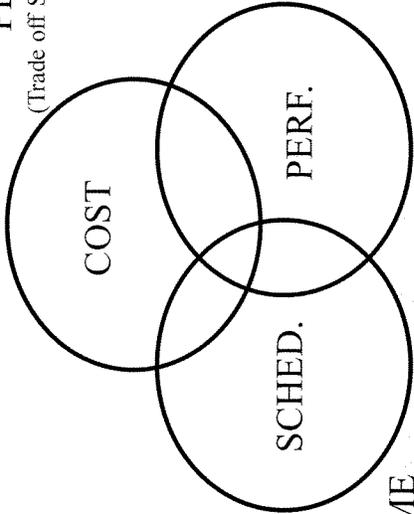
Financial ← Growth → ← Margins → ← ROIC →

Investors ← Growth → ← GARP → ← Value →



View #3: What Mode Are you In....

PEACE TIME
(Trade off Schedule and Performance)



WAR TIME SYSTEM
(Trade off Cost and Performance)

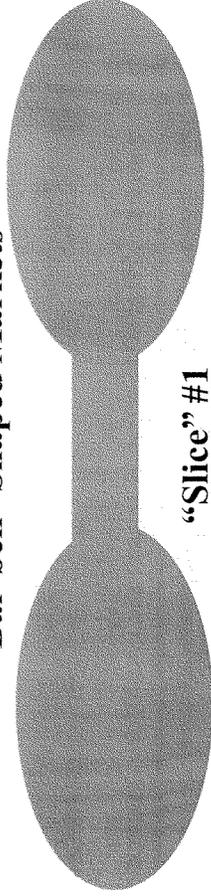
COLD WAR SYSTEM
(Trade off Schedule and Cost)

Current Problem – We are in Two Modes!



View #4: DoD Strategy Document Take Aways....

“Bar-bell” Shaped Markets



“Slice” #1

The Long War: rapid acquisition,
Off the shelf/short development,
quick response is key, COCOM centric

Dissuade: very long cycle,
Technology development, platform
oriented but limited production, service
centric

“Slice” #2

Reset/Retrofit: Install “black boxes”
in existing equipment to improve and
“plug into network”

Transformation: Desire for large,
horizontally integrating networks,
leverage the IT revolution



Defense Industry After the Consolidation of the 1990s



1990s Perfect Storm...

Cyclical Changes

Budgets Pressure from deficits, call for post-Cold War peace dividend, Procurement Holiday, cut programs/stretch out

Structural Changes

End of Cold War Rapidly changing unpredictable security environment, changing military requirements, fewer new program starts

Technological Change

IT revolution spilling over into defense, increased acceleration of technology cycles

Globalization

Of the economy, technology and labor

New Philosophy of Business

Demise of the conglomerate, "stick to your knitting", defense run as business

IMPACT

Horizontal mergers
Exit from industry
Increased risk

Vertical mergers
Disconnect

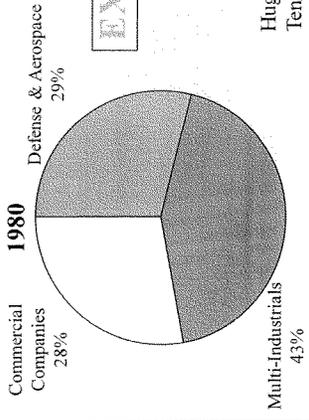
Export markets

Int'l competition

Exit from industry

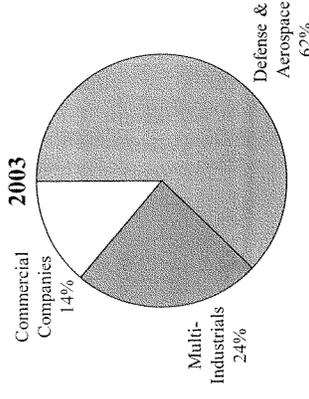
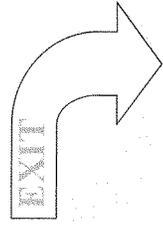
With Multi-Industrial and Commercial Firms Exiting...

% of Contract Dollars Awarded By Type of Company*



Total Prime Contract \$\$ Awarded to Top 100 = \$51B

- Hughes
- Tenneco
- Chrysler
- Rockwell
- Westinghouse
- Sperry
- FMC
- Gould
- Fairchild Indus.
- Singer
- Ford



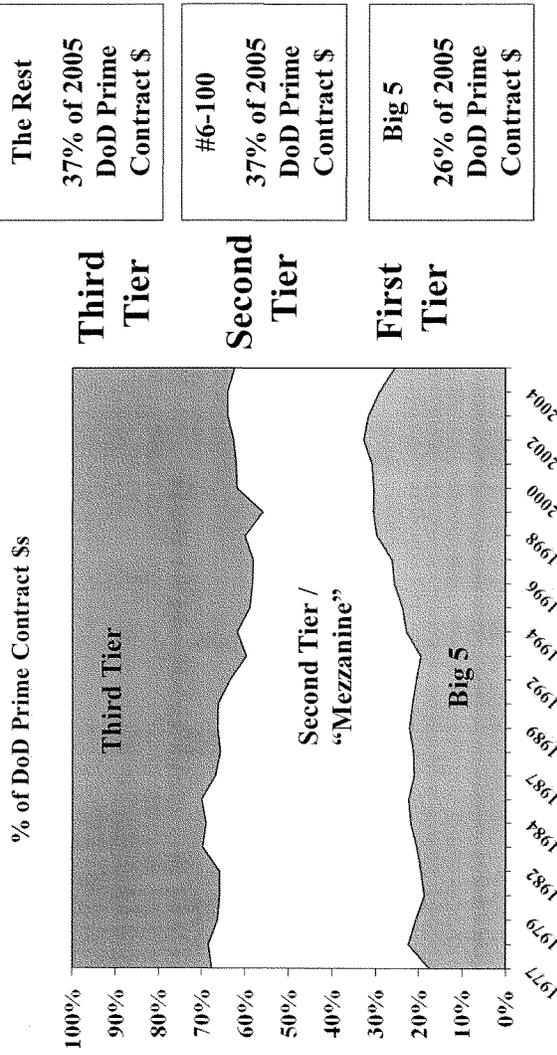
Total Prime Contract \$\$ Awarded to Top 100 = \$134B

Category	% Aerospace & Defense Sales
Aerospace & Defense	85%+
Multi-Industrials	16%-84%
Commercial	<16%

Total DoD Prime awards per DIOR reports



Resulting in 3-Tiered, Barbell-Shaped Industry...



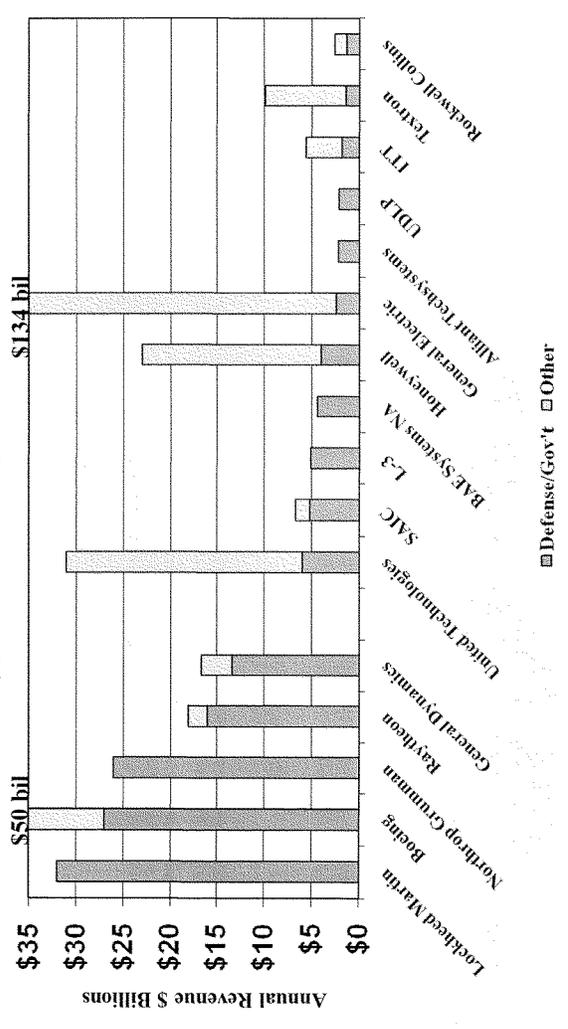
The Rest
37% of 2005
DoD Prime
Contract \$

#6-100
37% of 2005
DoD Prime
Contract \$

Big 5
26% of 2005
DoD Prime
Contract \$

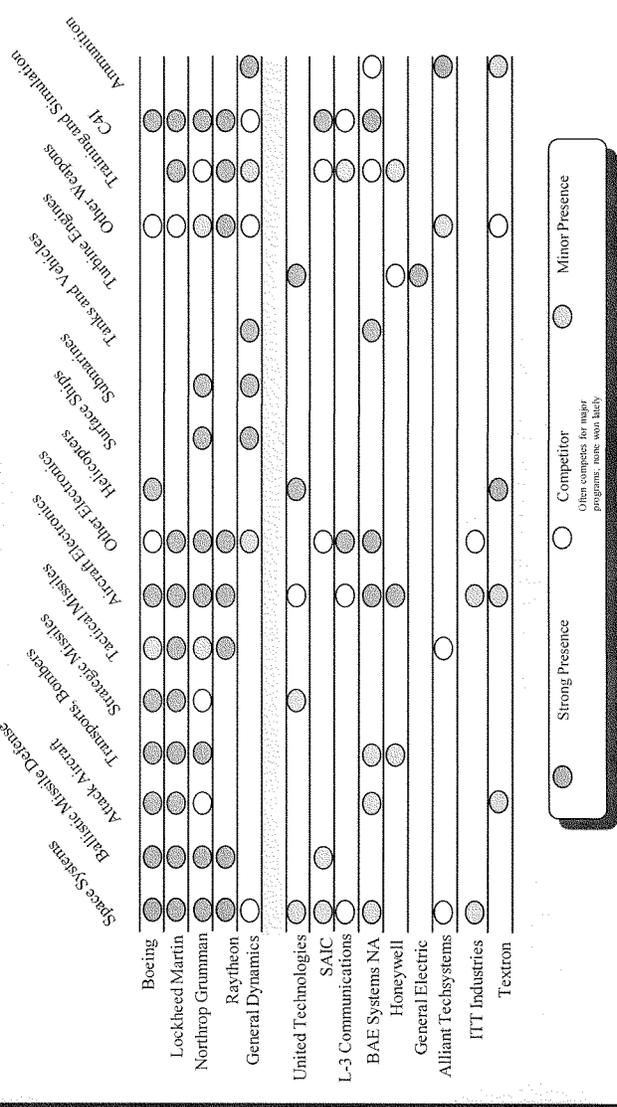
With Large Critical Mass...

Top US Defense Suppliers - 2003





And a Top Tier With a Wide Breadth of Capabilities..



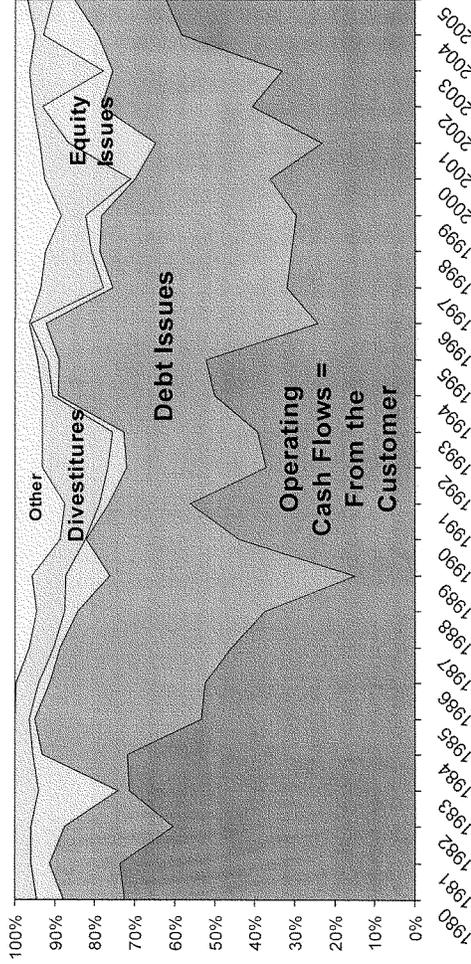


The Same Story Through the Lens of Incentives / Financial Returns

Why Care About Wall Street?

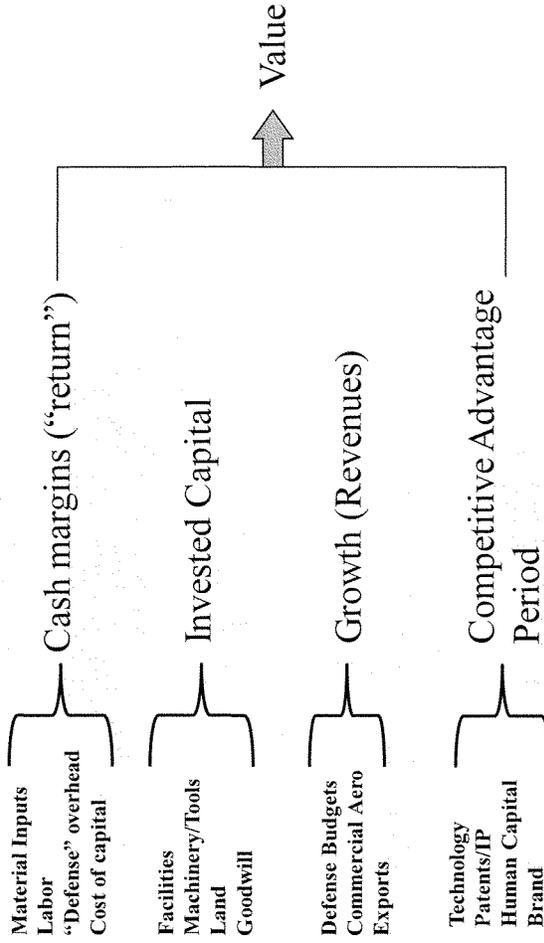
In the last 20 years, financial markets have provided 40-80% of the capital needed to operate...

Defense Industry Cash Inflows (Percent), 1980-2005



Sources: FactSet, S&P Compustat, Annual Reports, CSIS Analysis

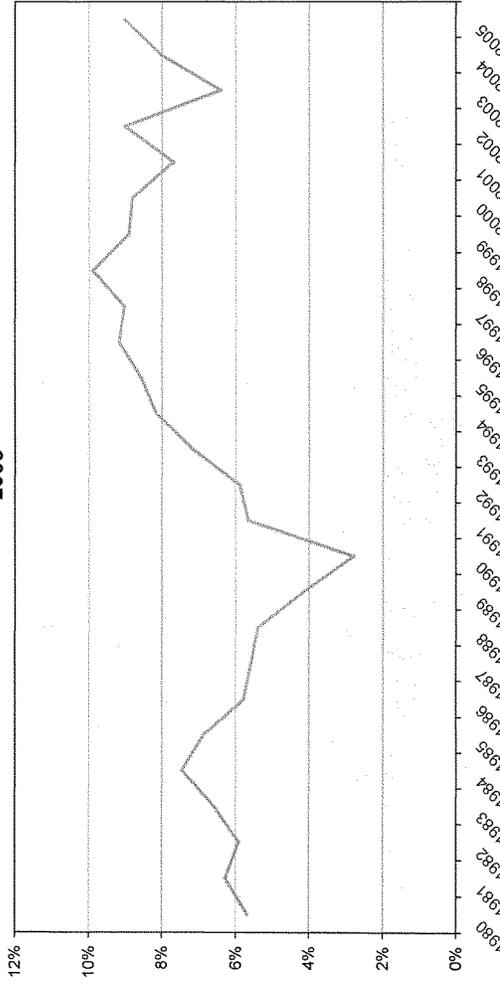
Industry Has Four Key Levers To Create Value





Overall Defense Industry Margins Near Highs...

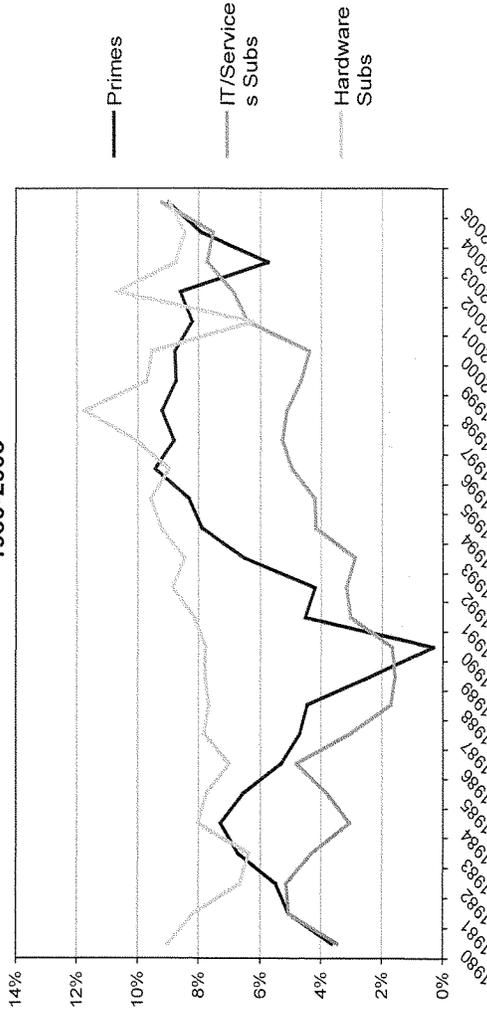
CSIS Defense Index Average Operating Margin (weighted by revenue), 1980-2005



Sources: FactSet, Company Reports, CSIS
 Note: CSIS Defense Index comprises 36 publicly-traded companies with majority revenues derived from US defense business. Boeing Military results have also been included here.

From A Return Standpoint, Second Tier Does Better...

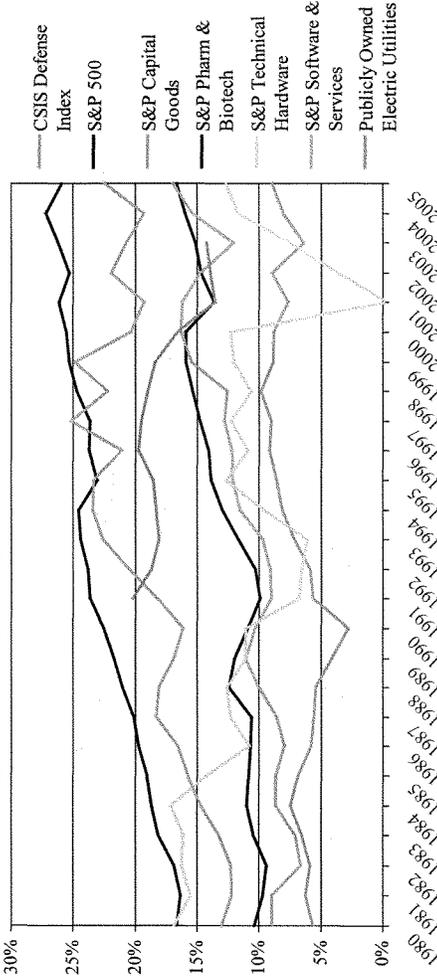
Operating Margin by Company Type (weighted by revenue),
1980-2005



Sources: FactSet, S&P Compustat, Company Reports, CSIS Analysis. Note: CSIS Defense Index comprises 36 publicly-traded companies with majority revenues derived from US defense business. Boeing Military results have also been included here.

*However, Compared to Its Peers the Defense Industry Has
the Lowest Returns...*

Industry Average Operating Margin, 1980-2005 (weighted by revenue)



Sources: FactSet, S&P Compustat, Energy Information Administration, Company Reports, CSIS Analysis.
 Notes: (1) CSIS Defense Index comprises 36 publicly-traded companies with majority revenues derived from US defense business. Boeing Military results have also been included here.
 (2) S&P Sub-sector constituents accurate back to 1994; composition held constant for years 1980 to 1993.

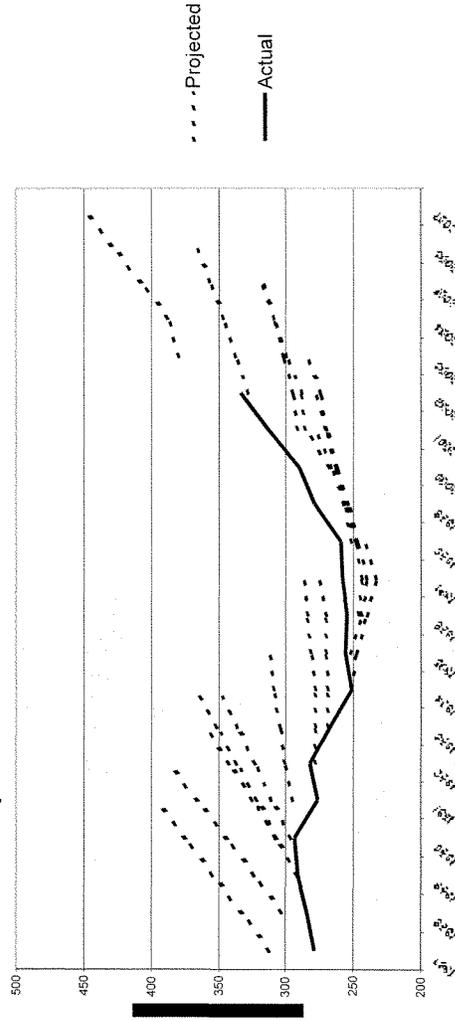


Conventional Wisdom

- Defense industry should have lower returns than peers because:
 - Defense industry has lower risk
 - Pentagon pays for “everything”
 - R&D and assets paid for
 - Industry has long term contracts and the FYDP
 - No one allowed to fail

Reality is Far Less Predictability...

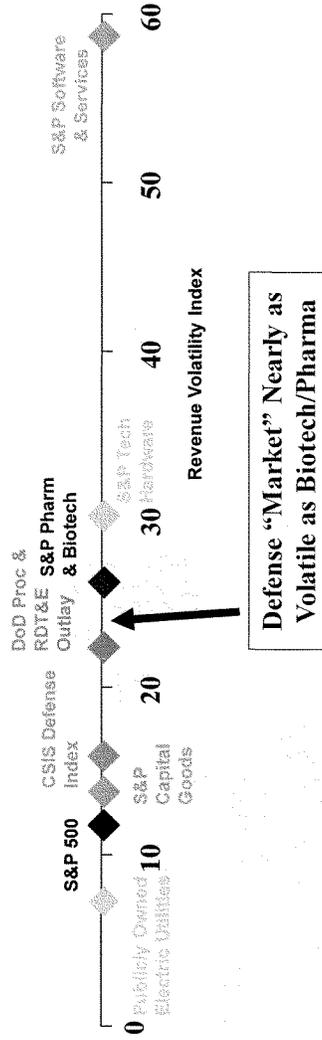
Department of Defense Future Years Defense Plans



Source: "Defense Budget for FY2003: Data Summary", March 29, 2002. Stephen Daggett and Amy Belasco, Congressional Research Service.

When Actually Measured, Volatility of the Defense Market is Higher Than Conventional Wisdom...

Industry Revenue Volatility, 1980-2005



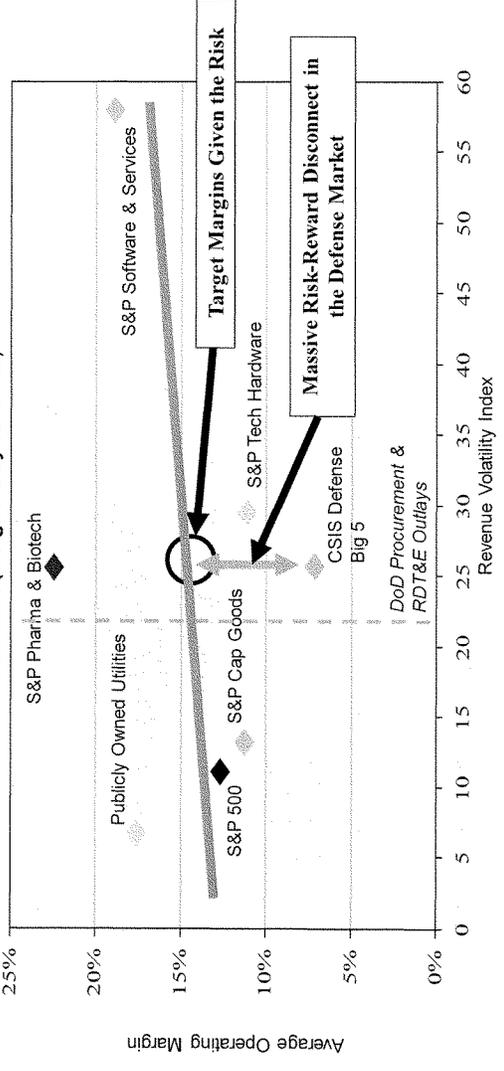
Sources: FactSet, S&P Compustat, Energy Information Administration, National Defense Budget Estimates for FY2004, CSIS Analysis 1993.
 Notes: 1) CSIS Defense Index comprises 36 publicly-traded companies with majority revenues derived from US defense business. Boeing Military revenues have also been included here.
 2) S&P Sub-sector constituents accurate back to 1994, composition held constant for years 1980 to 1993.



Policy Realities Leave Industry With Few Levers to Pull...

If margins cannot be increased, then lower volatility -- multi-years, O&M, political

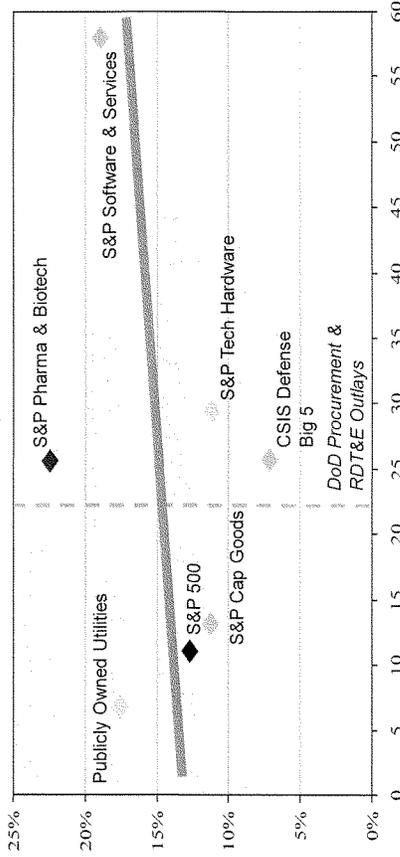
Industry Revenue Volatility versus Average Operating Margin, 1980-2005 (weighted by revenue)



Sources: FactSet, S&P Compustat, Energy Information Administration, National Defense Budget Estimates for FY2004, Company Reports, CSIS Analysis.

Policy Realities Leave Industry With Few Levers to Pull...

Industry Revenue Volatility versus Average Operating Margin, 1980-2005 (weighted by revenue)



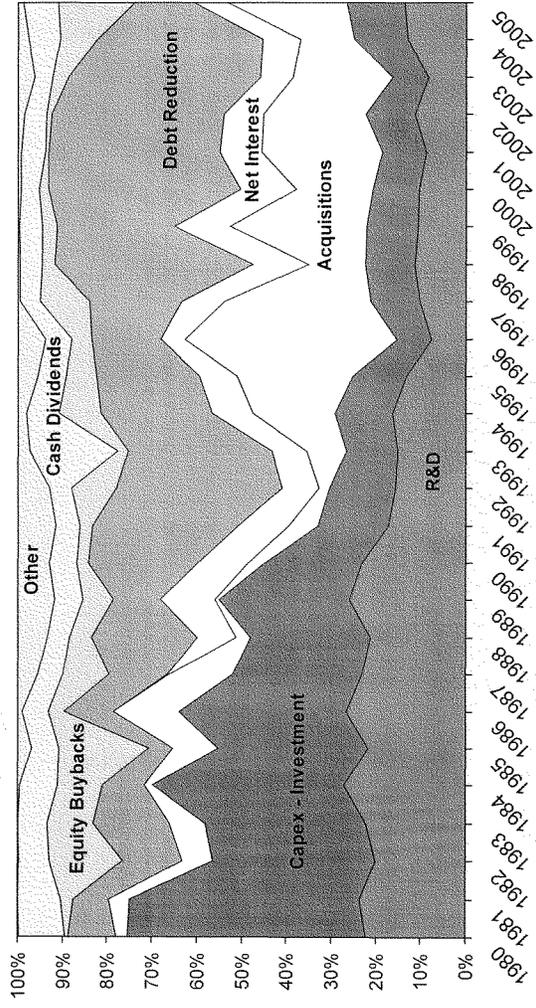
“Glass Ceiling” in Margins, Difficult Politically To Change

SO... Work the Volatility/Risk Side of the Relationship

Sources: FactSet, S&P Compustat, Energy Information Administration, National Defense Budget Estimates for FY2004, Company Reports, CSIS Analysis.

Financial Response to the Policy and Market Realities...

Defense Industry Cash Outflows (Percent)

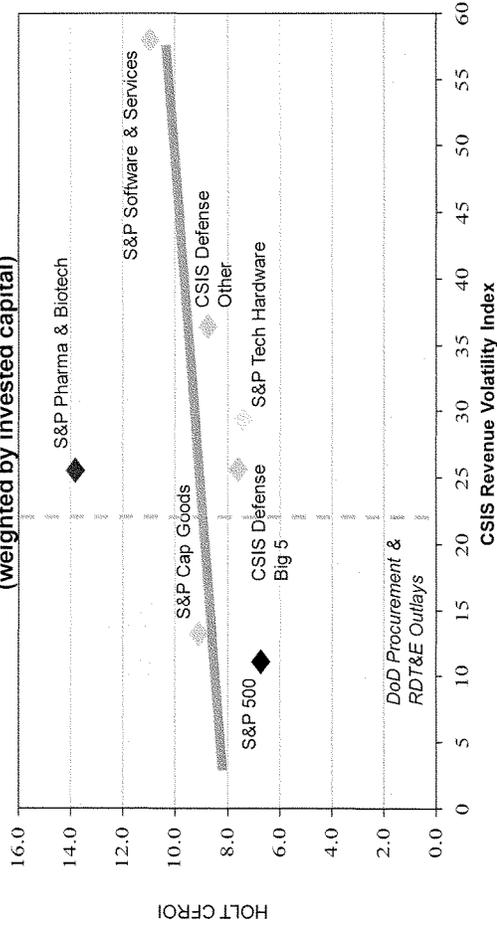


Sources: FactSet, S&P Computat, Energy Information Administration, Congressional Reports, CSIS Analysis

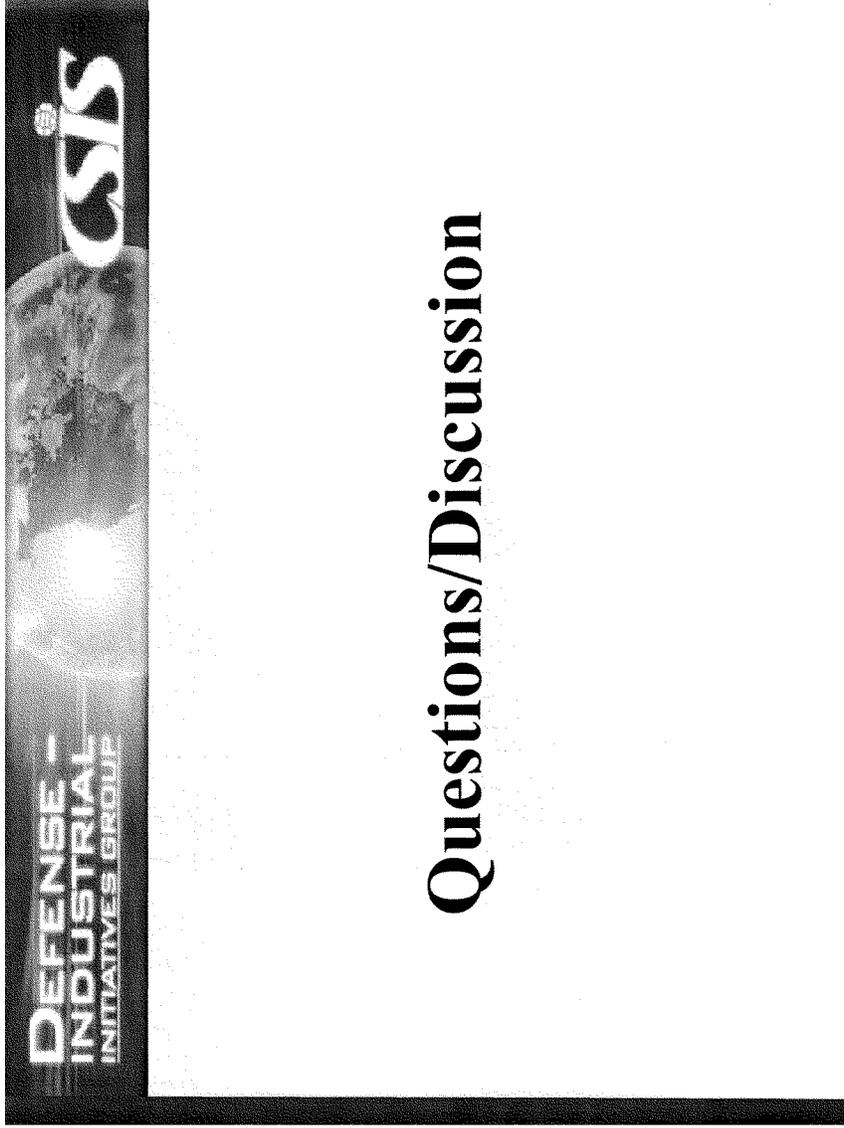


With This Strategy Industry “Returned To the Line” and Retained the Interest of Investors ...

Industry Revenue Volatility versus Cash Flow Return on Investment (HOLT CFROI) 1987-2005 (weighted by invested capital)



Sources: FactSet, S&P Compustat, Energy Information Administration, Congressional Reports, CSIS Analysis



Questions/Discussion



About CSIS

For four decades, the **Center for Strategic and International Studies (CSIS)** has been dedicated to providing world leaders with strategic insights on—and policy solutions to—current and emerging global issues.

CSIS is led by John J. Hamre, formerly deputy secretary of defense, who has been president and CEO since April 2000. It is guided by a board of trustees chaired by former senator Sam Nunn and consisting of prominent individuals from both the public and private sectors.

The CSIS staff of 190 researchers and support staff focus primarily on three subject areas. First, CSIS addresses the full spectrum of new challenges to national and international security. The **Defense Industrial Initiatives Group (DIIG)** is part of the CSIS International Security Program and focused on issues related to the global defense-industrial enterprise. Second, we maintain resident experts on all of the world's major geographical regions. Third, we are committed to helping to develop new methods of governance for the global age; to this end, CSIS has programs on technology and public policy, international trade and finance, and energy.

CSIS is private, nonpartisan, and tax-exempt. CSIS receives funding from public and private entities. CSIS does not take policy positions, the views in this presentation are those of the author.

Pierre Chao



Senior Associate (Non-resident), International Security Program

Programs:

Defense-Industrial Initiatives Group, International Security Program

Topics:

Defense and Security, Acquisition and Resources, Technology, Technology Policy

Pierre Chao is a senior associate with the Defense Industrial Initiatives Group in the CSIS International Security Program. Before joining CSIS in 2003, he was a managing director and senior aerospace/defense analyst at Credit Suisse First Boston (CSFB) from 1999 to 2003, where he was responsible for following the U.S. and global aerospace/defense industry. He remained a CSFB independent senior adviser from 2003 to 2006.

Prior to joining CSFB, Chao was the senior aerospace/defense analyst at Morgan Stanley Dean Witter from 1995 to 1999. He served as the senior aerospace/defense industry analyst at Smith Barney in 1994 and as a director at JSA International, a Boston/Paris-based management consulting firm (1986–1988, 1990–1993). Chao was also a cofounder of JSA Research, an equity research boutique specializing in the aerospace/defense industry. Before signing on with JSA, he worked in the New York and London offices of Prudential-Bache Capital Funding as a mergers and acquisitions banker focusing on aerospace/defense (1988–1990).

Chao garnered numerous awards while working on Wall Street, including having his team ranked as the number one global aerospace/defense group by *Institutional Investor* every year eligible from 2000 to 2002. He was also ranked the number one aerospace/defense analyst by corporations in the 1998–2000 Reuters Polls. In 2000, Chao was appointed to the Presidential Commission on Offsets in International Trade. He was a member of the 2005 Defense Science Board (DSB) Summer Study (Assessment of Transformation), 2006 DSB Summer Study (Strategic Technology Vectors), and the 2006/2007 DSB Task Force on the Health of the Defense Industry. Chao earned dual B.S. degrees in political science and management science from M.I.T.

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(4), of the Rules of the U.S. House of Representatives for the 112th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Armed Services Committee in complying with the House rule.

Witness name: Pierre A Chao

Capacity in which appearing: (check one)

Individual

Representative

If appearing in a representative capacity, name of the company, association or other entity being represented: _____

FISCAL YEAR 2011

federal grant(s)/ contracts	federal agency	dollar value	subject(s) of contract or grant
None			

FISCAL YEAR 2010

federal grant(s)/ contracts	federal agency	dollar value	subject(s) of contract or grant
None			

FISCAL YEAR 2009

Federal grant(s)/ contracts	federal agency	dollar value	subject(s) of contract or grant
None			

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2011): _____ ;
 Fiscal year 2010: _____ ;
 Fiscal year 2009: _____ .

Federal agencies with which federal contracts are held:

Current fiscal year (2011): _____ ;
 Fiscal year 2010: _____ ;
 Fiscal year 2009: _____ .

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2011): _____ ;
 Fiscal year 2010: _____ ;
 Fiscal year 2009: _____ .

Aggregate dollar value of federal contracts held:

Current fiscal year (2011): _____ ;
 Fiscal year 2010: _____ ;
 Fiscal year 2009: _____ .

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.

Federal agencies with which federal grants are held:

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.

Aggregate dollar value of federal grants held:

Current fiscal year (2011): _____;
Fiscal year 2010: _____;
Fiscal year 2009: _____.

DOCUMENTS SUBMITTED FOR THE RECORD

OCTOBER 24, 2011

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 PATRICK G. BARTLETT, MARYLAND
 MAC THURMOND, TEXAS
 WALTER B. JONES, NORTH CAROLINA
 W. TODD SPAHR, MISSOURI
 J. RANDY FORBES, VIRGINIA
 JEFF MILLER, FLORIDA
 JOE WALTON, SOUTH CAROLINA
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 THOMAS FRANKS, ARIZONA
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ROBERT L. SIMMONS, STAFF DIRECTOR

October 11, 2011

MEMORANDUM FOR PANEL ON BUSINESS CHALLENGES IN THE DEFENSE INDUSTRY

FROM: HASC Staff

RE: Summary from Industry Roundtable – Rock Island, IL

On October 7, 2011, Members of the Panel of Business Challenges in the Defense Industry traveled to the Quad Cities area of Illinois and Iowa to meet with members of the local defense industry. The Quad Cities area is home to Rock Island Arsenal (RIA) which comprises 946 acres on the Mississippi River between the cities of Davenport, IA, and Rock Island, IL. The island was originally established as a government site in 1816, with the building of Fort Armstrong. It is now the largest government-owned weapons manufacturing arsenal in the United States. It has been an active manufacturer of military equipment and ordnance since the 1880s. Established as both an arsenal and a center for the manufacture of leather accoutrements and field gear, today RIA provides manufacturing, logistics, and base support services for the Armed Forces. The Arsenal is the only active U.S. Army foundry, and manufactures ordnance and equipment, including artillery, gun mounts, recoil mechanisms, small arms, aircraft weapons sub-systems, grenade launchers, weapons simulators, and a host of associated components. Some of the Arsenal's most successful products include the M198 and M119 towed howitzers, and the M1A1 gun mount. Approximately 250 military personnel and 6,000 civilians work at the arsenal.

The Panel held a roundtable discussion with representatives from the defense industry at Black Hawk College, Moline, IL. See Appendix A for a list of participants. Following the discussion the delegation met with RIA leadership, and toured the Joint Manufacturing and Technology Center, the primary tenant on Rock Island, and other Arsenal facilities.

Members in Attendance

- Chairman Shuster
- Ranking Member Larsen
- Mr. Schilling
- Ms. Hanabusa
- Mr. Loeb sack*

*Non-Panel Member, invited to participate

POINTS OF DISCUSSION

- **Defense Contract Audit Agency** – Several participants indicated that **continued and significant backlogs at DCAA** and the complexity of incurred cost audits tend to hold up contract closeouts. A comment was made that one person was needed full time simply to support compliance/audit requirements and that it was difficult to self-audit.
- **Achieving Small Business Goals** – Many in industry felt that DOD was not achieving its Small Business goals (see figure 1) and that DOD contracting officials were not doing enough to hold prime contractors responsible for meeting the Small Business Contracting Plans submitted as part of the bid and proposal processes. Other comments:
 - Past performance (quality) regarding Small Business participation is not being considered in source selection
 - DOD’s tendency toward seeking “lowest price/technically acceptable” solutions is bad for small business because small businesses cannot “buy-in” [achieve economic order quantities] to reduce unit costs the way large companies can. Low price consideration over quality also generally means inferior product to the warfighter.
 - Some form of protection for businesses that have graduated from being a small business would be helpful because mid-tier businesses who no longer qualify for small business assistance cannot compete against the larger defense firms.
 - Work is not being passed through to small businesses in accordance with their proposed Small Business Contracting Plans. An example was given that on a \$1 billion contract, only \$35 million was subcontracted to small business. Many felt that there is a need for better accountability for meeting small business goals.

Prime Contracting Goals	FY 2009	FY 2010	FY 2011
Small Business	22.24%	22.28%	22.28%
HUBZone Small Business	3.0%	3.0%	3.0%
Service-Disabled Veteran-Owned Small Business	3.0%	3.0%	3.0%
Small Disadvantaged Business *	5.0%	5.0%	5.0%
Women-Owned Small Business	5.0%	5.0%	5.0%
Historically Black Colleges & Universities and Minority Institutions **	5.0%		

Subcontracting Goals	FY 2009	FY 2010	FY 2011
Small Business	37.2%	31.7%	31.7%
HUBZone Small Business	3.0%	3.0%	3.0%
Service-Disabled Veteran-Owned Small Business	3.0%	3.0%	3.0%
Small Disadvantaged Business	5.0%	5.0%	5.0%
Women-Owned Small Business	5.0%	5.0%	5.0%
Historically Black Colleges & Universities and Minority Institutions ***	5.0%		

Figure 1: DoD Prime and Subcontracting Goals

* Small disadvantaged business awards include 8(a) awards.

** Base for HBCU/MI measurement is awards to Higher Educational Institutions

***Defense Components are not required by DoD to establish separate HBCU/MI subcontracting goals. Instead these awards should be included when developing the subcontracting goals for Small Disadvantaged Business.

- **Industry Needs Clear Demand Signals** – One participant stated that small businesses are very good at being innovative and responsive, but DOD needs to do a better job of providing a clear demand signal and allowing industry sufficient time to respond. An example was given regarding a DOD requirement for 200 obsolete grinders and industry was only given 3 days to prepare a proposal in response. [Members of the Panel commented that some of this behavior may be caused by Congress failing to provide a full year appropriation at the start of the fiscal year.]
- **Flexibility in Cost/Pricing** – Comments were made that lengthy contracting periods (3-5 years) on firm-fixed price contracts require industry to “guess” on costs to procure raw materials for the period of performance. While larger industry may be able to absorb price fluctuations, many small business do not have the cash flow to do so. Industry participants indicated that commercial sales contracts use a price index and/or review at the 2- and 4-year points to address this issue and suggest that DOD and the defense industrial base would benefit from adopting that model.
- **Small Business Innovative Research (SBIR) Program** – there was strong concurrence that the SBIR program is very difficult to use and needs to be simplified. Of the participants in the room, few had actually participated in or benefitted from the SBIR program. Note: since most the effort at RIA involves manufacturing, it is not unusual for there to be a low number of participants in a program designed to foster innovation.
- **Prime Contractors in Control** – some participants indicated that big business was predisposed to an engineering solution and a small set of subcontractors that they consistently use. It was stated that it was very difficult to get the primes to listen to small business ideas and that “big business is in control.” It was suggested that small businesses need direct access to the DOD decision-makers/acquisition officials because big business did not want direct competition from small business. One participant specifically stated that he felt that the end-user, not the prime contractor, should make the decision to go with a specific sub-contractor/small business to buy a component/end-item.
- **Funding to Test Developmental Products** – participants indicated that small businesses often lack funding to carry a product from development through testing.
- **Partnering with the Defense Organic Industrial Facilities** – there was strong sentiment that partnering with defense facilities such as arsenals and depots was complicated, but works and is good for small business. Section 4544 of Title 10, United States Code, allows Army industrial facilities to partner with private industry in certain circumstances, but the authority limits the number of partnerships and has a sunset of September 30, 2014. Partnering can take several forms but is generally done in an effort

to allow private industry access to and use of government owned facilities, workforce and tooling while allowing the government to benefit from capital investments made by industry, the sharing industry best-practices, and access to intellectual property (e.g. technical data packages) without having to purchase the data. Section 325 of the House-passed version of the National Defense Authorization Act of 2012 would remove the limitation and make the authority permanent. There was strong support for this provision amongst the industry participants and RIA government leadership and they urged adoption of the provision. Partnerships such as this help to preserve DoD's organic capability.

- **International Trafficking of Arms Regulations (ITAR)** – ITAR is a set of government regulations that control the export and import of defense-related articles and services on the United States Munitions List (USML). Many from industry complain that ITAR is overly restrictive, takes a “one-size fits all” approach to determining what is placed on the USML, and does not allow for items to easily be moved off the list as technology advances and specific items or subcomponents become readily available on the global market. One of the industry participants jokingly referenced ITAR as a “jobs program” because of the time and effort industry spends trying to comply with the regulations.

Appendix A

*Roundtable Participants***Honsa Ergonomic Technologies, Inc.**- Mr. Thomas Honsa, CEO.

Honsa Ergonomic Technologies, Inc was founded in 1985 and currently has 8 employees. It manufactures the world's only full line of vibration reduced and ergonomically enhanced percussive and rotary tools for industry. Honsa also offers reduced weight, reduced sound levels and increased power to weight ration.

Mandus Group— Mr. Sam Kupresin, Vice President.

Mandus Group was established in 1999 and employs approximately 11 people. The company provides artillery solutions, logistics, repairs, and maintenance and support for multiple military weapon systems.

Group O —Ms. Dottie Tubbs, Vice President of Operations.

Group O provides solutions to marketing service execution, supply chain operations, and strategic packaging procurement. It is headquartered in Milan, IL and was founded in 1974. Group O has approximately 2500 employees, but has not done significant business with the DoD its 25 year history.

McLaughlin Body Company-Mr. John Mann, President, & Mr. Tom McLaughlin, CEO. McLaughlin Body Company engineers and fabricates operator protection systems—cabs, enclosures and metal components—for construction, military, agriculture and other heavy-duty vehicles. The company was founded in 1902 and is located in Moline, IL. It is comprised of approximately 500 employees.

Pendulum Resources —Mr. Alan Kruse, Program Manager.

Formed in 1999, Pendulum Resources is a Service Disabled Veteran Owned Small Business headquartered in Rock Island, IL that currently employees 13 people. The company specializes in providing expert personnel to augment staffing requirements and provides capabilities including logistics, engineering, planning, and emergency center operations.

Sivyer Steel— Mr. Art Gibeaut, President and CEO.

Sivyer Steel has expertise in carbon low ally, armor, austenitic manganese, and stainless steel castings. Sivyer currently is working with RIA through the Arsenal Support Program Initiative. The partnership includes work to reduce weight and increase the strength of cast components of the M119A2 105mm Gun Assembly. Sivyer Steel employees approximately 400 personnel. Defense contracts making up about 20% of its business.

Alcoa Davenport Works—Mr. Tony Morales

Alcoa Davenport Works produces aluminum products and services a wide range of industries, including the aerospace industry and armor components. Its products allow

multiple types of vehicles to be lighter and more efficient and cost effective. It opened in 1948 and is located in Davenport, IA. Alcoa Davenport has approximately 2100 employees. Alcoa Global has about 59,000 employees worldwide.

SSAB Americas— Mr. Jim Barber, Regional Sales and Product Development Manager. SSAB operates a steel mill located in Montpelier, IA. The flat rolled steel it produces is high performance with advanced chemical and physical properties. The Montpelier plant specializes in steel plate for end-uses such as bridges, tanks, agriculture implements, and wind towers. It employs approximately 8500 worldwide with about 1500 in the U.S.

SupplyCore— Mr. Steve Cotone, Program Manager & Mr. Mike Paul. SupplyCore specializes in global supply chain management and performance-based logistics ranging from the procurement of supplies to logistical support throughout the procurement process. The company is headquartered in Rockford, IL. It was established in 1987 as a one-room, family operated business. Today it has just under 100 employees.

PBC Linear— Mr. John Oller, Manufacturing Manager. The company is headquartered in Rockford, IL. PBC Linear is a manufacturing company that uses innovative processes to achieve high volume and rapid prototype capabilities. The company began in 1983 and has approximately 160 employees.

Vista International— Mr. Craig Roberts, President and CEO. Vista International is located in Rock Island, IL and provides strategic, solutions-oriented Information Technologies services. This includes skilled information management personnel to enhance existing staff or a managed outsourced solution. Vista International was first formed in 1998. It has approximately 420 employees with about 120 currently deployed in support of operations in CENTCOM.

Quad Cities Chamber of Commerce- Ms. Tara Barney, CEO. The Quad Cities Chambers is the community and economic development organization serving western Illinois and eastern Iowa. It is the largest business organization in the region and has offices in Moline, IL and Davenport, IA. The Chambers serves about 85,000 people.

Rock Island Arsenal Development Group- Mr. Tim Frye, Site Manager. The RIADG was formed in 2003 to help match appropriate tenants with available commercial space on RIA. The RIADG's purpose was legislated by the US Congress in the Arsenal Support Program Initiative to reduce the cost of U.S. Army installations while maintaining government-ready workforce.

Illinois Procurement Technical Assistance Center at Black Hawk Community College – Ms. Vicky Miller - Center Director

Mayor John Thodos - Mayor of East Moline, IL.

Mayor Bill Gluba - Mayor of Davenport, IA.

DoD Prime and Subcontracting Goals



WHITE PAPER

BUILDING AND MAINTAINING VALUE IN THE NATIONAL SECURITY SPACE INDUSTRIAL BASE

AIA's recent report, *Tipping Point: Maintaining the Health of the National Security Space Industrial Base*, highlighted some of the current challenges facing the national security space industry as well as recommendations for the path forward. In addition, AIA's recent paper, *What is Best for the Warfighter and Taxpayer*, lays out the broader steps the Defense Department should take to achieve efficiencies. As the focus grows on efforts to better manage America's fiscal situation, AIA hopes that this paper will help policymakers improve acquisition and efficiency.

AIA provides additional analysis of the sectors of the national security space industrial base to demonstrate that sustained investment in national security space systems remains critical to our defense. This paper provides specific recommendations that are intended to not only maintain space industrial base health, but also help build value in the national security space sector.

AIA believes that with a more competitive, contested and congested space environment, our country can ill-afford to trade off our leadership in space simply for cost savings. Rather, we must strengthen the partnership between industry and government to ensure that national security space systems are built with maximum value to government and the warfighter, with the idea that increasing efficiency will help make our nation's space programs both cost-effective and innovative. Our security, future workforce and economic vitality all depend on both industry and government getting it right when it comes to sustaining our partnership in this new and complex era.

THE NATIONAL SECURITY SPACE INDUSTRIAL BASE:

AIA has identified the following technologies that provide skills and capabilities within the national security space industrial base that are vital to both our national security and economic security: application-specific integrated circuit technologies, critical supply chain components, liquid rocket propulsion, military satellite communications, missile warning, overhead non-imaging/persistent infrared, positioning, navigation, timing, selected space optics and solid rocket motors and their components.

When surveyed, AIA members expressed concern with the following areas of the national security space industrial base:

- **Protected Communications:** The Air Force has spent decades developing protected communications capability. With the cancellation of the Transformational Communications Satellite System, the successor to the Advanced Extremely High Frequency (AEHF) satellite system, our nation's protected communications engineering capability and workforce is in jeopardy due to the lack of a clear path forward. The current AEHF Capabilities Insertion Program is the only means to continue risk reduction activity until government decisions are made and resourced. AIA is concerned about a significant loss of skilled workforce in the protected communications sector, which puts at risk future U.S. capabilities.
- **Liquid Propulsion:** The current condition of the U.S. liquid rocket engine propulsion industry is the result of significant consolidation of production programs, the general lack of new opportunities for engine development and a variety of starts and stops on liquid engine programs.

AIA is encouraged that authorization bills for both NASA and the Defense Department budgets have required a comprehensive study of the U.S. liquid propulsion industry and a plan to sustain U.S. industrial capability. Such a plan is only beneficial to industry if it addresses current conditions, develops the requirements for future U.S. propulsion needs and is committed to the long term. It is critical that the sustainment plan exercise both the production and design capabilities of the industrial base.

We must restore and sustain the supplier base, leverage the common requirements of the Air Force and NASA and, where possible, the commercial launch customers. The current very restrictive export control regulations on the launch and propulsion industry should be reviewed, especially in light of growth in the commercial spaceflight sector.

- **Missile Warning:** The U.S. has spent 40 years developing space based infrared missile warning capabilities that detect and track enemy missiles. Yet the Missile Defense Agency's acquisition approach for the Precision

Tracking and Surveillance System, the successor to the Space Tracking & Surveillance System, resets the program to the technology development phase. The technology development phase is expected to be carried out by U.S. universities, and full industry competition in the development has not been provided even though a 2008 Institute for Defense Analysis study cited lack of competition in this area as a significant concern.

AIA is concerned that, with an operational system expected to be developed during the middle of the next decade, the government risks losing the workforce skills required to develop a cost effective operational future missile warning system. Adding prototype development only delays fielding the needed capability, increases risk and expends unnecessary resources.

- **National Systems:** In addition to missile warning there are other national systems at risk of atrophying, which could result in second and third tier suppliers leaving the business. Industrial base and critical skills that have been preserved and improved through U.S. government strategic and sustained acquisition methodology will be lost. Capability areas like sensors; optics; radiation hardened trusted microelectronics; trusted application specific integrated circuit design; specialized materials and structures; assembly, integration and test; and data management systems – areas in which the U.S. has consistently excelled – are in jeopardy. Maintaining the current level of national systems work will be a very real challenge. It is important for government to work closely with industry to ensure capabilities are maintained to meet current and future national security needs.
- **Solid Rocket Motors:** Solid rocket motors (SRMs) are utilized for launch of large defense and scientific satellites and the Space Shuttle, as well as for small satellites and missile defense. According to the 2009 Defense Department Solid Rocket Motor Industrial Capabilities Report, "Inadequate investments are being made in large and small SRM research and development (R&D), reducing the reliability and cost-effectiveness of the SRM industrial base." The report goes on to say that, "If there are no new development programs, the SRM industry will continue to lose its ability to design and produce new-generation SRMs." AIA believes a plan to sustain a healthy and competitive SRM industry base is critical to national security. In addition, commercially-produced small launch systems are needed to ensure continued investment in the propulsion and SRM industrial base.
- **Supply Chain:** National security space systems rely on electronics, microelectronics, advanced chemicals, materials and other components that must endure extended operations in difficult conditions with high performance requirements. Title III of the Defense Production Act (DPA) of

1950 plays an important role in the maintenance of domestic supply chain and component parts used for military space systems. The government should investigate ways to ensure that the DPA and other tools provide effective, quick response to at-risk production capabilities essential for the national security space sector. In addition, continuous programs for adding stability and predictability in the supply chain could benefit the supplier base and reduce space program risk.

The industries that provide these components often employ an extensive global supply chain and are subject to regional and global regulations and policies related to environmental management. These regulations and policies can restrict production, availability and usage of chemicals, materials and components critical to the manufacture of national security space systems. This calls for a strategy to address the potential impacts of such chemical and material regulations on national security space systems. Where substitutes and alternatives for regulated chemicals exist, specifications and performance requirements should allow for their use. Where substitutes and alternatives are not known, exemptions should be granted until replacements can be found.

The implications of lost space capability are even more severe today, so it is vitally important to match policy goals with strong leadership, integrated strategy and the long-term funding and stability needed to maintain our nation's preeminence in space.

STEPS NEEDED TO BUILD AND MAINTAIN VALUE IN THE NATIONAL SECURITY SPACE SECTOR:

The challenges associated with constrained budgets and a push for greater efficiency demand a closer look at the way we buy our space systems. As government makes decisions to cut costs and purchase more efficiently, these decisions should not be to the detriment of our critical capabilities in national security space. We must maintain our core space capabilities while also achieving the best value for both the warfighter and taxpayer.

In addition to AIA's recommendations in its reports *Tipping Point* and *What is Best for the Warfighter and Taxpayer*, the following steps can be taken to build value in the national security space sector:

- **Ensure national security space capabilities are modernized and maintained:** The weakening or loss of key national security space skills and capabilities to foreign competitors may result in higher long-term costs to government and could jeopardize security. Balanced and stable budgets and funding are absolutely vital to ensure a healthy industrial base. However, it is imperative that government also take a leadership role in assessing which specific national security space capabilities –

down through the supply chain – are at risk of being lost and make the necessary plans for deliberate sustainment and modernization of those capabilities.

- **Block buys of satellites:** AIA believes that targeted block buys of major satellites could help reduce costs and the length of time to complete major satellite systems. This would inject critical stability and predictability into fragile sectors of the space industry, which has often been plagued by program cancellations and changes. Increased capabilities could be added incrementally to ensure our satellite programs adapt to changing technology. Adding predictability and stability to our major satellite acquisitions would also potentially assist in promoting international sales.
- **Flexibility on firm fixed price contracts:** While firm fixed price contracts may work in some sectors, the space sector is often characterized by high risk, long lead times and budget instability. Fixed price contracts can create high risk for contractors and may not be appropriate for complex, large scale satellite acquisitions. If costs do increase under such contracts, those increases are often most damaging to the industry's supplier base. AIA believes that the Defense Department should consider the complexity and scale of a project when developing its associated contract mechanism.
- **Sourcing Wisely:** Competition and long-term performance-based outcomes stimulate the greatest level of innovation, productivity, effectiveness, and efficiency. As cited in AIA's paper, *What is Best for the Warfighter and Taxpayer*, this requires a well trained, appropriately staffed and empowered government acquisition workforce. To help meet DOD's efficiency goals, a more narrow interpretation of "inherently governmental" will help maximize these success factors when evaluating organic versus industry solutions for product support and business services.

While government laboratories have an important role to play in our nation's cutting-edge research, AIA is concerned about efforts to in-source the manufacture of space systems to laboratories without allowing industry to compete. As cited in this report, the acquisition effort for the Missile Defense Agency's Precision Tracking and Surveillance System utilizes universities and laboratories even though industry has already worked in this area and may be able to provide cost savings to the government.

- **Modernize the export control system for satellites and related components:** There is a need to re-evaluate ITAR controls on space technologies and sharpen the provisions of the 1998 law, P.L. 105-261, to keep our country safe and industry strong. Commercial communications satellite technology restrictions are particularly in need of review. Actions to modernize the export control system and enhance space trade among

our allies will help build a stronger, more efficient space industry and supplier base that is able to meet challenges associated with budget-constrained government customers. AIA will continue to work with and encourage the U.S. government to take the necessary action to reform our export control system.

- **Utilize responsive space and small satellites to augment space capabilities:** While not a replacement for major national security space constellations, Operationally Responsive Space (ORS) and other science and technology (S&T) efforts seek to deploy satellite capability quickly and at relatively low cost to the taxpayer. ORS capability is intended to help replenish, augment and reconstitute space assets – especially in a time of attack or to meet the urgent needs of our military.

In addition to making our space capabilities more robust, ORS and other S&T missions could play an important role in keeping the industrial base healthy. Satellites designed within short timelines help provide additional programs to challenge our engineers and design teams. These types of small R&D projects also provide the workforce with expertise and personal satisfaction. A targeted number of smaller, more frequent space system acquisitions could help keep industry and its workforce active, support the development of new cutting-edge technologies and make our satellite architectures more robust.

- **Leverage commercial and commercial off-the-shelf (COTS) technology:** The U.S. military spends hundreds of millions of dollars on software to visualize and track our satellites even though COTS software is available. Utilization of COTS software for space situational awareness could potentially result in substantial savings to the U.S. government. In addition, commercial space launch technology developed by industry could also be used to launch small military satellites. AIA believes this would produce savings when compared to the cost of maintaining excess ICBM assets for space launch. Opportunities for ride-sharing and secondary payloads in commercial launch systems could also support government needs for cost-effective launch.

CONCLUSION:

As our nation faces multiple overseas conflicts, continued economic challenges and a burgeoning debt, we must take the steps needed to maintain our national security space industrial base while also building value to meet government and warfighter needs.

AIA hopes its recommendations will provide national leaders with useful ideas on how to acquire and manage our space efforts more efficiently while also supporting the warfighter, a strong workforce and industrial base.

**WITNESS RESPONSES TO QUESTIONS ASKED DURING
THE HEARING**

OCTOBER 24, 2011

RESPONSES TO QUESTIONS SUBMITTED BY MS. HANABUSA

Mr. WATTS. See attachment [Appendix, page 103]. [See page 16.]

Mr. DOWNEY. [The information was not available at the time of printing.] [See page 16.]

Mr. CHAO. [The information was not available at the time of printing.] [See page 16.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

OCTOBER 24, 2011

QUESTIONS SUBMITTED BY MS. HANABUSA

Ms. HANABUSA. In your testimony, you mentioned that the Independent Panel that writes the Quadrennial Defense Review does not communicate well enough with defense industry while conducting their research. Specifically, who in industry does the panel need to communicate more with?

Mr. DOWNEY. [The information was not available at the time of printing.]

Ms. HANABUSA. Please explain in more detail the connection between Wall Street and the defense industry.

Mr. CHAO. [The information was not available at the time of printing.]

