

The Space Industrial Base - An Update

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I. INTRODUCTION

Joe, thank you for that introduction. It's great to be here and I'm honored to be your luncheon speaker. I especially want to commend the AIAA for doing their usual first class job in organizing this timely and informative event and in choosing to hold this in such a neat place as Albuquerque. Thanks as well to Air Force Space Command, AFRL, NASA, Lockheed Martin and Space News for co-sponsoring this conference . I also want to congratulate today's award winners – your accomplishments are impressive give us all confidence in the future

It was almost a year ago that I gave a speech at SPACE 2000 at Long Beach on the state of the US Space Industrial Base. I'm not sure how many of you all were there or read the text. Nevertheless, I thought it would be useful today for me to provide an update on what has transpired in the intervening timeframe and relate my remarks to our space technology base which I would argue is the underpinning of our future space leadership. Although my focus would appear to be the national security side of our

space program (the military and the Intelligence Community), the subject of the health of the industrial base clearly affects us all.

To outline my remarks this afternoon. First, I'll touch on three studies that raised the awareness of the state of the space industry. Then, I will review the actions of our government in response to those findings of those studies followed by a snapshot of where we are today. Finally, I will end with some brief prescriptive remarks for the future.

As many of you know, our national space policy directs that the United States maintain its leadership by supporting a strong, stable and balanced national program that serves our goals in national security, foreign policy, economic growth, environmental stewardship and scientific and technical excellence. This policy context provides the imperative to ensure the country maintains a strong industrial base for space.

II. THE BACKDROP

Last year, I concentrated on the DOD/NRO sponsored study of the U.S. Space Industrial Base. Since that time, the Defense Science Board Task Force report on the state of the Defense Industry and the Space Technology Alliance-sponsored Space Technology Industrial Base study have been

published. These three studies raised the consciousness level of key decision makers in government and industry and provided the backdrop for most of the activities that have transpired in the last year.

As you might recall, the Space Industrial Base Study came about because of a concern on the part of then Deputy Secretary of Defense, John Hamre about the unintended consequences of the series of industry mergers, the impact of acquisition decisions such as the Future Imagery Architecture (FIA) and the generally poor performance of defense stocks on Wall Street. As a result, a study was kicked off to look at the sufficiency of and competition within the space industrial base and I was privileged to lead the study. Over the course of the six month effort, we received input from 35 space users within the government to characterize the demand and 21 space companies which constituted the supply function. The study concluded that there was more than adequate capacity and competition in our industry; however it highlighted a concern with the deteriorating financial health of companies such if not addressed that we believed might pose a threat to future sufficiency and competition. The study concluded that the investment case to the Board of Directors of space companies was becoming increasingly hard to make as the cost of new money was equal to

or greater than the profit that the industry typically realized. In the intervening 18 months since the study was published, the financial picture has improved somewhat and stock prices are up. However, systemic financial problems resulting from high debt loads, a relatively low return on sales and uncertainties in the timing and funding of programs still plague the industry.

In addition, we found that research and development was viewed more as an expense than an investment in the future. In fact, Independent Research and Development or IRAD was increasingly linked to winning the next acquisition rather than building a stock of technologies to exploit in the future. IRAD was often being used to buy down risk and hence the acronym could be characterized as little I, little R and big D. One might also expect that in an increasingly competitive business environment with fewer programs and a decreasing demand, the erosion of key human resources would have been an important issue. As a matter of fact, it did surface as the number #1 issue to all of the CEO's we interviewed – unequivocally and unanimously. Industry leaders were seriously concerned about the graying of the workforce and the inability to attract and retain the best and the brightest. I am not going to dwell on the

workforce issue as Rick Stephens will be talking to you on this subject in a few minutes and I am pleased to note that he spearheading an effort to publish an AIAA policy statement on workforce management.

In summary, the study showed that space industrial base issues were not fully understood by the Government and that prompt attention was needed to preserve the future. As the study was reporting out, Dr. Jacques Gansler, then the acquisition czar in the Defense Department, wondered whether space was a microcosm of a broader issue. Therefore, he decided to convene a Defense Science Board Task Force to look at the entire defense industry. The DSB group was chaired by Phil O'Deen from TRW. By the way, it is interesting to note that the DSB group also included Dr. David Chu, Mr. Dov Zacheim (both of whom have become Under Secretaries of Defense in this Administration) and Mr. Pete Teets, formerly of Lockheed Martin.

The DSB Task Force reported out in November of last year and recommended several actions that directly relate to the current and future state of our space activities. The Task Force called for 5 actions to improve the long term future of the industry. First, it called for real commercial-

military integration which includes exchange and access to each other's technical capabilities and talent. Cooperative R&D, already a hallmark of the space industry, would become even more important in the future.

Second, they called for a change in policy to further emphasize the review of acquisition strategies with a view toward preserving a robust, competitive and technologically current industrial base. These reviews should also be supported by real increases in R&D spending. They were not suggesting an increase in R&D in the terms of applications or demonstrations like ACTDs; rather, they were recommending a 3% increase in R&D that was more oriented towards S&T. Fourth, the Task Force concurred in the space study in recommending an improvement in the financial and competitive vitality of the defense industry. One of the suggestions was to take steps to improve the cash flow with the industry. The Task Force found that one of the historic attractions of the defense industry had been its cash flow. Specific recommendations to improve its vitality and allow the industry to refocus on the long versus the short term included modifications to progress payment schedules and the paid cost rule. Last, the Task Force concluded that the process to secure licenses was too cumbersome and was adversely affecting our global competitiveness.

Therefore, they recommended that the administration reform the export control process.

Our SIBS study and the DSB report showed a high degree of correlation. About the only point of difference concerned the degree of reliance on commercially developed technology. While other sectors of the defense industry could perhaps become increasingly reliant on commercial technology, the SIBS study concluded that, other than certain communication satellite applications, there was little evidence that this paradigm would work for space.

The third effort sponsored by the Space Technology Alliance provides another important backdrop especially for this audience. As many of you know, the Space Technology Alliance is a cross sector government organization which includes the military services, NASA, DOD, the NRO, and BMDO among others. The Alliance-sponsored study of the Space Technology Industrial Base, not surprisingly, found that Industry and the government were investing in near term technologies versus the mid and far term. Moreover, the technologies that were being emphasized were those that offered evolutionary advances versus the potential to further revolutionize space. The study underscored the fact

that, unlike some other business sectors, the space commercial marketplace was not sufficiently robust to underwrite national technology investment. Government investment therefore was needed to maintain a future technology supply and spur innovation.

So let me try to summarize, these studies concluded that while our space industry and the state of R&D was acceptable for the immediate present, there were significant financial stresses for the near term, and potentially a loss of competition in the mid and far term as the industry continues to downsize and rationalize. Also, the a short term business focus was undermining R&D and impacting the industry's ability to attract and retain of the best people.

So what has been the response to all these studies – all this paper. Given our general laissez faire policies with respect to industrial base issues, it would have been easy to put the problem off to another day. Well the bottom line is we see the beginnings of a really a good news story as there has been a lot of very positive actions since I spoke to you at Long Beach.

III. ACTIONS IN RESPONSE

I'll describe these actions in two phases. The first phase covers the actions by Dr. Gansler in the closing days of the last Administration and the second phase covers the actions to date during the current Administration.

To his credit, Dr. Gansler, , started action even before all three of the reference studies were completed. For example, he directed that industrial base considerations be formally included in all Acquisition Strategy Plans. He also made sure that those policies were codified in the Oct 2000 rewrites of the DOD 5000 series acquisition directives. Additionally, Dr Gansler started several initiatives that called for increased R&D spending, allowed for the reimbursement for recruiting and retention of people with key skills, proposed change to regulations to provide defense companies a greater chance to make higher profits in R&D and allowed companies to retain a greater portion of the savings they reap from efficiencies and reducing overhead costs.

Dr. Gansler teed up these initiatives, but he ran out of time in late 2000. As the Administration changed, a big question was whether the new team would sustain the momentum. But before I deal with that question, let me cover another important activity which influenced the new

Administration's positions on industrial base issues – the Space Commission aka the Rumsfeld Commission.

As you may recall, the Space Commission took place from July of 2000 through Jan of 2001. The Commission has received considerable publicity and has stimulated a lot of initiatives. To be sure, it helps when the Chairman of the study becomes the Secretary of Defense. The overarching theme of the recommendations was to raise the consciousness of Administration and in Congress on space issues and raise the organizational level at which space issues were considered. I am sure that most of you all have either read the report of the Space Commission or have been briefed on its content. However, by way of a reminder, there were two findings in the report that are especially relevant to the industrial base.

First, the Commission concluded that the US Government needs to develop a new relationship with industry to ensure US space technological leadership. Specifically, the Government must allow industry to earn a reasonable rate of return on its business; it must become a more reliable customer of space products; it should increase space R&D investment and focus on those critical technologies unique to national security.

Secondly, the Commission dealt directly with the people issue. Here the finding was that the US Government needs to play an active, deliberate role in “expanding and deepening the pool military and civilian talent in science, engineering and system operations that the nation will need”, to maintain our position in the 21st century as the leading space nation in the world.

The message from the Space Commission was that the health of the space industry was an issue that required active Government involvement in partnership with private sector.

But all measures, the current Administration places a high priority on industrial base issues and has taken up the challenge with a real sense of purpose. Mr. Aldridge, in his confirmation hearing as the new USD (AT&L), emphasized the importance of industrial base in 2 of his top 5 priorities. He has called for bolstering the strength of the industrial base through things like profit incentives and attraction of Wall Street investment and quality personnel. He also has placed a priority on leveraging technologies for the long term through greater S&T funding. His priorities have been reflected in some of his initial actions:

Mr. Aldridge is attempting to reestablish a more effective long term balance on the government -industry risk-benefit equation. In a 16 May memo on contractor cost sharing, Mr. Aldridge directed that DOD acquisition community to carefully consider the amount of investment that industry is required to make in defense programs . He specifically directed that the use of IRAD, cost ceilings, annual funding caps and awarding contracts at below probable costs will only be permitted on an exception basis. In the development of the budget and consistent with his priorities stated in his confirmation hearing, Mr. Aldridge is advocating an increase in next year's S&T budget to 3%.

I think these actions will go a long way to returning us to healthy competition within industry and over time offer a better business case for space investment to the Board of Directors of our various defense companies. I note on the agenda that you will hear from Wolfgang Demisch on Wednesday morning. He will be able to give you a better and more informed opinion on the financial health of the defense sector. From my perspective, I think the initiatives will also make defense stocks more attractive on Wall Street. In addition, I think the direction will have a further benefit of restoring a better balance in our industry and

government between the need for S&T type R&D and development of the next programs.

I am pleased to note that the Air Force, by far and away the largest purchaser of DOD space systems, has responded directly to the policy change. Recently, Ms Druyun acting on behalf of the Air Force acquisition community, has added her emphasis to the USD AT&L memo to include: a prohibition against using contractor investment to cover government funding shortfalls by having future source selections exclude contractor investments from the best value consideration. I think this change will assist government and industry getting IRAD back to a position of independent, enabling research and development or big I, big R and big D.

Another part of the good news story is the imminent start up of the "Commission on the Future of the United States Aerospace Industry". In my travels around the country and in discussions with industry and Government, I find that few are familiar with this new Commission or its purpose. In case you haven't heard about this group, let me give you some background. This commission was established in the FY 2001 National Defense Authorization Act. The 12 member commission is chartered to study the issues associated with, and assess the future importance of the domestic

aerospace industry in the global economy, particularly in relationship to United States national security. The full slate of commissioners have been announced, the staff is forming up and we should expect the commission to have their first meeting sometime in September. This will be a far ranging commission and the scope of its intended work is significant to this audience.

As mentioned, the Commission gets underway next month and their specific agenda is still TBD. Nevertheless, I understand that they may well examine several areas to include a review in the government budget process to assess the adequacy of projected aerospace R&D and procurement budgets. It will interesting to see how they handle the subject of research and development funding. They are likely to examine the acquisition processes with emphasis on our ability to develop and field aerospace systems that incorporate new technologies in a timely manner. In other words, how well do we do on capitalizing on the ideas that are presented in conferences like this. Policies procedures and methods for financing and payment of government contracts are also a subject of interest given the globalization of space and the issue of export controls. The Commission will likely review statutes and regulations governing

international trade and technology export. In this area, It would appear that this Group will need to look at the balance between the protection of our national security and the need for improved access to global markets to ensure international competitiveness fro our aerospace industry. It has been suggested that policies governing taxation will also be reviewed for their effects on international competitiveness relative to other industries. By the way, the aerospace industry does not enjoy significant tax advantages compared to some other industries. The adequacy of the national space launch infrastructure will likely be examined. The last area concerns the adequacy of government support for science and engineering education.. As will be discussed often in the course of this symposium, the education of our young people and creating incentives to attract the needed talent to the aeronautics and astronautics fields is critical to not only our national security, but our future as well.

While the Aerospace Commission was directed by the Congress, the White House has also taken an active interest in space. As you may recall, the Space Commission was critical of the last Administration's handling of the interagency process dealing with space issues. As a consequence, the National Security Council has created a Policy Coordinating Committee for

Space. This committee promises to improve the overall government awareness and coordination of space issues by remanding them to a standing policy committee versus working them on an ad hoc basis which was often been the case over the last decade. The Coordinating Committee includes 10 subcommittees dealing with such subjects as space transportation, spectrum allocation management and export controls. I am pleased to note one of the sub committees deals with the space technology industrial base.

This sub-committee is co chaired by the NRO and OSD Industrial Affairs. It's goal is to address the ability of the Nation to provide critical capabilities in space research and technology, while ensuring a robust space industrial base exists to support national security requirements. This group will assess key areas that affect the space industrial base, to include: R&D investment, new initiatives in space research and technology, education and workforce issues, and issues spanning industry, academia and government roles for providing for critical space research and technology, academic research, and government laboratories and facilities. I am told that the subcommittee will rely heavily on the work done by the Space Technology Alliance on the industrial base and the increased

awareness brought about by the Space Commission. By the way, a recent Request for Proposals indicates that this subcommittee will conduct an assessment of space research and development and its industrial base in the coming months. This will be a unique opportunity for many of us in this audience to assist in the development of the future strategy. In that light, I'd like to take a few minutes to propose a framework that might be used in such an examination.

I think the framework should emphasize technology horizons and technology focus areas. The Space Technology Alliance work is helpful here as it identified a technology horizon with 4 components. The technology horizon components are Basic Research, Technology Development, Concept Demonstration and Fielding of Systems. It could be argued that the current technology horizon has been shaped by government and industry actions in the preceding decade. During the last decade, government and industry's clear emphasis on concept development and fielding of systems has adversely affected the Basic Research and Technology Development. Many would argue that the future technology base is increasingly at risk. Accordingly, the proposed examination of the technology horizons then couldn't come at a better time.

As for how to prioritize the effort I am probably biased, but I would suggest that the examination should focus its assessment on the areas identified in the Space Commission report. Let me quickly review those seven areas:

1. Reducing the cost of launch and space systems by emphasizing miniaturization and new ways of doing business
2. Developing new sensors that can detect and track smaller moving and concealed targets from space under all environmental conditions
3. Promoting on-orbit data processing and artificial intelligence to reduce human operator costs and the high burden of high data volume on the communications architecture
4. Developing advanced launcher and propulsion technology to reduce the cost of getting to and maneuvering on orbit. Gen. DeKok mentioned this need this morning in discussing reusable launch vehicle investment and the need for the Air Force to work closely with NASA in this area.
5. Developing on orbit servicing equipment
6. Developing advanced surveillance and defensive and offensive technologies need for space control

7. Developing advanced command and control, guidance and pointing, power generation, materials and optics technologies needed for power projection from space

The other important facet of this upcoming examination is your participation. Let me presume to suggest that the AIAA, the Government and the industry attendees at this conference should start pondering the following questions to support the development of a proactive future oriented strategy.

What is the state of R&D in the commercial, national security, civil, academic, and laboratory environments?

How does the government industry partnership foster RD growth in the Space Industry?

What responsibilities should the government have as the primary or perhaps the sole customer for space advanced R&D?

What breakthrough space-related technologies have unique government applications?

What mix of revolutionary and evolutionary R&D is needed to sustain future capabilities?

What are the needed incentives for industry and government labs to invest in breakthrough technologies?

IV. CONCLUSION

Recently, a senior officer in the Department of Defense told me that the Air Force was only as good as the products of its acquisition community. I would then extrapolate that the acquisition community's products are only as good as the industrial base that builds them. There has long been a premise that the industrial base in the long term is only as good as its technology base and the Space Technology Industrial Base study posited that the space technology base is dependent on government and industry investment. That investment includes government and industry investment in real R&D, investment in people and investment in government industry partnership. This forum is a great example where we can develop the mutual understanding which is the fundamental foundation for partnership.

The AIAA and this conference is all about developing that understanding and promoting that partnership. The topics that will be covered on the next two days cover the whole gamut of where should the US go in space. I'd like us to reflect back on a key recommendation by the

Space Commission and rephrase it with two questions: How do we keep the U.S. technology edge? And how do we keep U.S. government space systems one generation ahead of US commercial capabilities and two generations ahead of foreign space systems?

I think I have seen a significant change in emphasis over the last two or so years with respect to space and our space industrial base. There is now a growing consensus in this Administration and in Congress of the absolute criticality of space to our national security and that space will become increasingly important. Accordingly, maintaining US leadership will be one of our highest priorities. In that regard, each of you has a role to play.

Again my thanks to the AIAA and the co-sponsors for holding this Conference and for giving me the opportunity to speak to you this afternoon.