

**House Armed Services Committee
Strategic Forces Subcommittee
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Introduction

Good afternoon Madame Chairman, Ranking Member Turner, and members of the Subcommittee. It is good to have the opportunity to testify before you today on such an important topic as the U.S. national security space industrial base. As the President and Chief Executive Officer of the Aerospace Industries Association (AIA), I represent our nearly 300 aerospace manufacturing companies and the over 650,000 highly-skilled employees, including the over 140,000 who make the satellites, space sensors, spacecraft, launch vehicles, and the ground support systems employed by the Department of Defense, the National Reconnaissance Office, and other civil, military, and intelligence space efforts. I welcome the opportunity to come before you today to talk about the importance of our national security space industrial base, and the challenges we must confront to ensure a healthy and robust domestic space industry.

Importance of Investing in National Security Space Infrastructure

Today's national security space systems are a critical infrastructure that provides the high-technology capabilities that our nation simply cannot afford to do without. The jobs held by the thousands of workers, scientists, and engineers who design and build these systems are just the kind of jobs needed to keep our nation strong and our economy innovative and competitive.

To provide a few examples; electro-optical and other types of imaging satellites allow high-fidelity intelligence on everything from terrorists in the tribal regions of Pakistan, North Korean and Iranian missile programs, to the arms modernization efforts of our strategic competitors. When North Korea or Iran launch a missile, our space systems provide early warning that notifies our national leaders and defense officials, and space and launch technologies play an integral role in intercepting those missiles should they be directed at the U.S. or our allies.

Satellites also provide global, secure communications, and positioning and navigation that are increasingly relied upon by our service members in irregular warfare environments like the hard-to-reach mountains of Afghanistan, and to our sailors and Special Forces off the coasts of Africa where traditional forms of communications are lacking. In addition, satellites provide needed bandwidth that support the rapidly growing numbers of unmanned aerial systems deployed in global irregular conflicts.

And of course, without the launch and associated networks of ground support systems we wouldn't be able to get these satellites into orbit to begin with. Also critical to ensuring our space systems operate effectively are space protection and space situational awareness capabilities deployed by industry and government. As evidenced by the February 2009 collision of a commercial U.S. satellite and Russian satellite, more resources must be provided to the Department of Defense to protect our space assets in an increasingly crowded environment.

To summarize, the capabilities provided by space systems are critical, they support virtually every aspect of our modern military, and in cases such as global positioning, are now relied upon by millions of American civilians. In fact, our nation's economy is tied directly to space technology. Communications drive today's commerce, and space systems are a chief conduit of our nation's communications systems. Our direct-to-home television and satellite radio have become normal in many American homes and automobiles. It's absolutely necessary for us to continue to maintain and upgrade our space infrastructure, adequately protect it, and ensure a healthy space industrial base.

Industrial Base Challenges: Export Barriers

With that said, there are a variety of very serious challenges that are negatively impacting the health of our national security space industrial base. At the forefront of these challenges are the strains created by our nation's export control policies for space technology.

In 2008, AIA participated in the Center for Strategic and International Studies (CSIS) study titled, "The Health of the U.S. Space Industrial Base and the Impact of Export Controls." This important study came about after rising concern within the national security space community regarding the health of the space industrial base and the impact of export controls on the industrial base.

The resulting findings showed that export restrictions have hit our nation's space companies, and especially the space supplier base, particularly hard. According to CSIS, the U.S. dominated the global satellite export market at over 70% of worldwide share in 1995.¹ Three years later, Congress passed a law that moved the export classification of commercial communications satellites to the International Traffic in Arms Regulations (ITAR) regime, which was intended to protect sensitive space technologies and preserve U.S. preeminence in space.

While the intentions of the move might have been good, the results were disastrous. According to the CSIS report, contract awards for commercial communications satellite manufacturing dropped over 20% by 2000, and by 2005 the U.S.'s worldwide share of the global satellite export market stood at a mere 25%. ITAR hasn't slowed down the spread of space technology – today over 70 nations are engaged in space activities. Since

¹ Center for Strategic & International Studies, *Health of the U.S. Space Industrial Base and the Impact of Export Controls*, February 2008

U.S. law was changed, many companies in Europe and elsewhere actually tout their satellites and components as “ITAR-free.” Commercial satellites are now the poster child for the need to further modernize the U.S. export control system. Due to ITAR, U.S. firms are forced to navigate an extremely challenging pathway to gain export approval, even to do business with key allies. Even more troublesome is that all parts of a commercial satellite – no matter how innocuous – are restricted and considered munitions list items. This poses challenges to the U.S.’s ability to lead space partnerships with our allies abroad and it is wreaking havoc on our domestic space industrial base.

With outdated and unduly restrictive export control policies preventing the development of a robust commercial base for the U.S. space industry; our nation has in-effect forced the space industry to rely on the U.S. government for its survival. According to CSIS, 60 percent of the industry’s revenues are tied to national security, and when civil government space is included nearly 95 percent of the industry’s revenues are tied to the U.S. government.² This creates a situation in which government plans and policies directly impact the health of the industrial base, as opposed to situation where a modernized export control regime leads to a more innovative and competitive industry.

A recent survey by the National Security Space Office of nearly 200 small U.S. space companies found that 70 percent of those companies surveyed cited ITAR restrictions as inhibiting their ability to compete for foreign business. Over 40 percent of companies cited ITAR restrictions as causing hiring difficulties.³ Many of the survey’s findings show that our nation’s small space businesses are the most vulnerable to fluctuations in government funding and compliance burdens. Small businesses are the foundation of any strong and innovative industry, but we are facing some real challenges in sustaining and growing that sector due to export restrictions.

At a time when the U.S. government should be encouraging growth across all sectors of the economy, export controls are limiting growth in the space sector, especially among component suppliers. In the absence of a healthy, cutting-edge, space industrial base in the U.S., our government may be forced into relying on foreign suppliers for key components, and we face the very real threat of losing our preeminence in space.

Industrial Base Challenges: Shrinking Workforce

In addition to concerns about export controls on the overall health of the U.S. space industry, we face a significant challenge as many employees are approaching retirement eligibility. America’s workers, scientists, and engineers represent the core of our nation’s space industrial base – but there are very real concerns that we are not producing the workforce needed to keep America on the cutting edge of technology development.

² Testimony of Mr. Pierre Chao, before the House Foreign Affairs Committee’s Subcommittee on Terrorism, Nonproliferation and Trade, April 2, 2009

³ *Barriers to Entry and Sustainability in the U.S. Space Industry*, National Security Space Office, February, 2009

According to a 2005 study performed by the Defense Department's Cost Analysis Improvement Group (CAIG), there is a "significant shortfall in the 30-40 year-old engineers and scientists supporting the space industry."⁴ The seasoned employees in 30-40 year-old range, who would normally be prepared to take the reigns when older employees retire, are just not present in sufficient numbers.

Without a robust pool of space professionals to draw from, we risk losing our nation's edge in producing the world's preeminent space technologies, especially as nations like China and India graduate thousands more engineers than U.S. universities annually. While we no longer face the "missile gap" of the early days of the space age, the "engineer gap" is a real and growing concern.

Adding to concerns, today almost 70 % of our eighth graders are below proficient in math and science, and our fifteen year olds are constantly being outperformed by other nations.⁵ According to the GAO, in 2006 the percentage of U.S. post-secondary students earning degrees in science, technology, engineering, and mathematics (STEM) fields has fallen from 32 percent in 1995 to 27 percent in 2004.⁶ Our industry is very concerned about their future workforce and is very supportive of efforts to improve STEM education.

To help attract more young people to the space industry and STEM career fields, I'm pleased the Department of Defense and other agencies are supporting industry's very own STEM program, the Team America Rocketry Challenge (TARC). TARC is the world's largest rocket competition for middle and high school students and is an event that is highly enjoyable to attend. Among this year's 100 finalists are teams from Wilson High School in Florence, South Carolina, First Baptist Church in Manchester, Connecticut, and both Mitchell High School and Cheyenne Mountain Charter Academy from Colorado Springs. We invite all of you to attend the final competition in The Plains, Virginia, on May 16.

Industrial Base Challenges: Acquisition Process

Challenges specific to our acquisition system also hamper industry's ability to provide the necessary space systems our warfighters expect. Although most defense programs deliver products and services on schedule and on budget, recent studies and reports indicate that cost growth, schedule delays and performance challenges that impact some major programs have emphasized the need to make meaningful reforms to the acquisition system. Space systems are often the target of these discussions.

⁴ Center for Strategic & International Studies, *Health of the U.S. Space Industrial Base and the Impact of Export Controls*, February 2008

⁵ Based on results from the 2007 National Assessment of Educational Progress administered by the U.S. Dept. of Education and the 2006 Programme for International Student Assessment administered by the OECD

⁶ United States Government Accountability Office, Testimony before the Committee on Education and the Workforce, House of Representatives, *Science, Technology, Engineering, and Mathematics Trends and the Role of Federal Programs*

The ability of the defense acquisition process to produce the best military equipment at the best value for the taxpayers is dependent on several important factors – a strong industrial base, a rational and flexible acquisition process, well-defined requirements, budget realism, stable procurement plans, and a well-trained and experienced acquisition workforce.

AIA believes that there is room for significant improvement in the Defense Department's acquisition process. This process is complex, crossing many functional and organizational areas leaving many observers to conclude that the system is too large, too bureaucratic, too cumbersome, too expensive, and too slow in getting needed goods and services to our warfighters.

Up front planning and knowledge of industrial base capabilities are critical to success, in order to enable informed and meaningful trade-offs between (a) less ambitious capabilities that can be made available more quickly at lower cost and (b) capabilities that rely on greater leaps in technology but that are also harder to define, involve greater risk, take longer to deploy and are more costly.

Problems emerge when there is a failure in one or more of these factors. As DoD Under Secretary John Young wrote in his January 30, 2009 memo to Secretary Gates, cost growth took place in a number of programs because they were “built on artificially low cost estimates, optimistic schedules and assumptions, immature design or technology, fluid requirements and other issues.”⁷ He identified changing or excessive requirements as a factor in most programs and budget instability as a major problem stating: “programs have apparent cost growth because the Defense Department cut annual quantities for budget reasons, driving higher unit costs.” In this memo, the Advanced Extremely High Frequency (AEHF) Satellite was highlighted as a victim of DoD's overly optimistic assumptions, and Wideband Global SATCOM registered as having cost overruns merely as a result of buying two additional satellites. These changes were made not to reflect a flaw in program performance, rather in recognition of their role in fulfilling a critically needed bandwidth capability.

There have been a number of efforts recently to address these factors through the legislative process. In the last decade, the number of acquisition provisions enacted by Congress has increased by three-to-four fold. In the past two years alone, that number has approached 100. While some of these address serious problems, the continuously changing set of acquisition rules is itself causing instability in the system which could contribute to schedule delays and increased costs.

As highlighted by the good work of the Government Accountability Office, more realistic cost estimating is critical to improving space system acquisition. In July 2006, AIA formed a Cost Estimating Forum Working Group made up of industry contractors and key government representatives from the USAF, OSD, NRO and DNI. This effort

⁷ *Reasons for Cost Changes for Selected Major Defense Acquisition Programs*, John J. Young, Jr. USD (AT&L), January 30, 2009

developed into what is known today as the Joint Space Cost Council, chaired by Air Force Deputy Assistant Secretary for Cost and Economics.

On January 9, 2009 the Under Secretary of Defense for Acquisition, Technology & Logistics announced that the Defense Department is moving to require the standard work breakdown structure pioneered by the Joint Space Cost Council – an important step towards making improvements in national security space program management. The Cost Council has engaged NASA, GAO and other federal government stakeholders to continue to expand their efforts. I'm proud of this effort and the work that industry and government have done to address challenges associated with national security space cost estimating.

When it comes to acquisition reform as a whole, any long-lasting reform must consider the impact both within the government and within industry to assure successful outcomes. Successful and sustained reform must also take into consideration the factors that drive industry decision making and the impact on the capability of the space industrial base to support our national space policy.

Government and industry agree that there are major disconnects in the defense acquisition process among the government requirements, programs and budgeting functions. All these critical elements of the defense acquisition process must be repaired. Budget and program stability along with solid cost estimating are the building blocks of world-class acquisition. To achieve that goal will require a renewed partnership between the Defense Department, Congress, and industry.

Steps to Help Ensure a Healthy Space Industrial Base

Budget and requirements instability, an inefficient procurement system, and unpredictable “feast or famine” lead times between contracts have all contributed to a weakened space industry and increased numbers of space program schedule delays and cost overruns. Coupled with an aging workforce that is not being replaced by an adequate number of bright young minds, and export restrictions that limit growth, the space industry is being severely strained.

AIA released a report earlier this year, “The Role of Space in Addressing America’s National Priorities,” which identifies areas for immediate attention in the space sector. Many of these recommendations, if acted upon, would also contribute to the strengthening of the U.S. space industrial base.⁸

First, AIA recommends the establishment of a national space management and coordination body, reporting to the president, with the authority to coordinate cross departmental and agency space efforts. With management, budget, and acquisition authority for space programs currently spread across a variety of competing agencies, a

⁸ AIA, *The Role of Space in Addressing America’s National Priorities*, http://www.aia-aerospace.org/assets/report_space_0109.pdf

space coordination body would help provide the strategic and comprehensive decision-making so critical to the space industry.

Second, balanced and stable funding is critical for the development of national security space systems. Complex space platforms cannot be built overnight and are often designed and built over long periods of time. Stable budgeting helps ensure that industry is able to do the planning necessary to engage in the long-term development of space technology and AIA supports implementing multi-year procurement authorities for complex space systems to help stabilize the budgeting process. AIA agrees with the CAIG's conclusion that "stability starts with government's funding and plans, leads to efficient and productive industry workforce, and results in well performing programs that deliver mission area success."

Third, we must continue to create opportunities for our current workforce and make science and education a national priority. Support for STEM initiatives are critical and must continue to help lessen the strain of the nation's "engineer gap." Additionally, it will be important to continue to support small businesses in the industry to keep a healthy job market available and ensure innovation in the marketplace.

Finally, when it comes to ITAR and export controls, the time has come to take the concrete steps needed to re-evaluate ITAR controls on space technologies, including commercial communications satellite technologies, and sharpen the provisions of the 1998 law to keep our country safe and industry strong. Without meaningful steps to modernize the U.S. export control system and enhance space trade among our allies, the U.S. faces a real and daunting possibility of losing our preeminence in space and our ability to compete in the global space industry.

Our nation's space industry began over fifty years ago to design and build the systems and capabilities needed by our military and early space program. Today, the U.S. government relies on space technologies and its associated industry more than ever before. As such, it is important to provide the resources needed to maintain a healthy workforce and industrial base. This includes robust and stable funding, investments in STEM education, support for national space leadership, and modernization of outdated export controls on space systems. With other nations such as China and India rapidly improving their own space efforts, it is essential that our nation take the right steps to ensure our space industry – which really is a national treasure – remains the world leader.