

**Written Testimony for Pierre Chao,  
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Before the House Foreign Affairs Committee –  
Subcommittee on Terrorism, Non-Proliferation and Trade  
Hearing on Export Controls on Satellite Technology  
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Mr. Chairman, Mr. Royce and distinguished members of the Subcommittee, thank you for inviting me to testify today on the critical issue of satellite export controls.

I was asked to discuss the findings, conclusions and recommendations of a study titled “The Health of the U.S. Space Industrial Base and the Impact of Export Controls” that I co-chaired in 2007 and early 2008. At the time of the study I was a full time employee of the Center for Strategic and International Studies as a Senior Fellow and Director of the Defense-Industrial Initiative Group. I am no longer a full time employee of CSIS but remain a Senior Associate, Non-Resident. I am currently a Managing Partner with Renaissance Strategic Advisors, an aerospace/defense strategy consulting firm, which I would note, in the interest of full disclosure, currently has no clients in the satellite industry.

The study was undertaken in response to mounting concerns on the part of the national security space community about the health of its space industrial base and the rumblings that the space related export control regime was causing problems within the industry. I was fortunate to have an outstanding working group on this study; a well balanced group that represented the myriad constituencies and interests on this topic. My co-chairs were Tom Young and Bill Ballhaus, two very well known and respected authorities in the space community. We had individuals who brought a Department of Defense perspective, such as Paul Kaminski, General Tom Moorman, General John Tilelli and Jeffrey Bialos; who brought a State Department perspective, such as Lincoln Bloomfield; the perspective of industry, such as John Douglas of the Aerospace Industries Association, John Klineberg, Tom Marsh of Lockheed Martin, and J.R. Thompson of

Orbital Sciences; that of component manufacturers, such as Dick Albrecht of Moog and David Danzillio of Emcore Photovoltaics; the viewpoint of the “new space” community, such as Lon Levin of SkySeven Ventures; and the Congressional perspective, brought forth by Robert Walker. We were also able to leverage some outstanding data and analysis generated by the Bureau of Industry and Security at the Commerce Department and the Air Force Research Laboratory. It is important to note that the findings and recommendations are a consensus set of findings and recommendations, the result of long discussion but ones which all the members of the group stand behind.

The working group approached the problem with a few key principals. First, leadership in space is critically important to U.S. national security. Second, there are deep interdependencies between the four pillars of the space community – defense-related space, intelligence-related space, civil space and commercial space. The same industrial base and infrastructure supports all four and therefore a U.S. weakness in one sector impacts the others. Third, it is important to have a strong space industrial base. Fourth, a prudent export control policy is important and necessary. Finally, we looked at the issue of the health of the space industrial base and export controls through a national security lens rather than an economic viewpoint. The Congress in its 1999 legislation related to space export controls was very clear in its intent when it noted that national security should trump economics when it comes to this topic. Therefore, we first tried to assess whether the national security and strategic goals on the U.S. were being served by the space export control policy.

We had thirteen findings, I will group some of them together for sake of brevity:

- The overall financial health of the top tier of the space industry was “good”. The good was in quotes because there was a fragility to that health. Although the industry was recovering from the telecom boom bust of the late 1990s, early 2000s and defense-related space was on the upswing there was still more capacity than work. Furthermore there are well documented human capital and program execution issues in the industry. Finally, there are some noticeable weaknesses,

such as sole U.S. supplier, single sources of failure issues in the second and third tier of the industry.

- The U.S. space industrial base has returned to being very dependent and tied to the defense market. Sixty percent of the industry's revenues are tied to national security, include civil government space and 90-95% of the industry's revenues are tied to the U.S. government. Clearly the industry was founded on supporting the government – whether for defense needs or NASA and other civil agencies, but in the 1990s there was a broadening of the industrial base. Today the services component of the space industry is very commercial and global. The U.S. space industrial base is becoming “arsenalized”. This raises a key strategic point. If we continue down this path then the national security community will “own” the industry and will have to provide for its health. The alternative is encourage and enable the U.S. space industrial base to participate more in the global market place and broaden its economic base, increasing its viability and competitiveness.
- Space capabilities continue to proliferate globally. There are rapidly emerging foreign space capabilities and the US does not control their proliferation. And in certain sectors where the U.S. once had preeminence and a very far lead, the gap is beginning to close as other nations gain the ability to place satellites in orbit and gain sophisticated monitoring technologies and communications capabilities.

The current space export control system has not prevented the rise of these other space powers. It may have slowed them down or increased the cost of developing these space capabilities, but it has not stopped them. In fact, in one of the more striking findings, the U.S. space export control regime may have actually encouraged the development of overseas space capabilities when that country was initially happy to use American components. From that perspective, through a perverse set of unintended consequences, the export controls may have triggered the exact opposite of the strategic intent of the controls.

- The current space export control regime makes it difficult to engage in cooperation with our close allies and is constricting U.S. engagement and partnership with the rest of the global space community on the civil and

commercial side of the community. In fact there is some conflict with a stated goal of the U.S. National Space Policy, which is to “encourage international cooperation with foreign nations on space activities that are of mutual benefit”.

- Regardless of what study one looks at, the U.S. satellite industrial base has been losing global market share and the U.S. space industrial base has been withdrawing from the global market place at the 2<sup>nd</sup> and 3<sup>rd</sup> tier because of the friction of participating in global projects.

In fact, it is the 2<sup>nd</sup> and 3<sup>rd</sup> tier of the industry that are suffering the most from the friction in the system. As small businesses they have less resources than the large players to work their way through the export control system, and are more dependent on having as broad of a business base in order to sustain the necessary investments in factories and research and development. Once again, there has been an unintended consequence – the way the export control regime is constructed, once a satellite was designed a munition by legislation, every part and component (including a simple bolt) is by definition a munition. This was not the intent according to those who were involved in the drafting of the original legislation, but it has nonetheless been the result. The instrument that was used to achieve the U.S.’s goals has turned out to be too blunt of an instrument.

- It is important to have export controls to protect sensitive national security space capabilities. There should be a way to improve the process and regime without harming national security.

In summary, we found evidence that strategic goal and national security imperative of the space export control policy were not being achieved, and worse, may be encouraging the exact opposite of its intent. And that it was having unintended consequences by harming our own industrial base, particularly the small businesses in the industry.

We had a series of recommendations in our report. I will highlight a few key ones.

- The Administration and Congress should review and reconcile the strategic intent of space export controls. It has been a decade since the

legislation changing the space export control policy was passed. It's time for a review and I consider this hearing as a very good first step.

- Critical space technologies should be identified and should remain on the Munitions List and under the State Department ITAR process. Rather than use the blunt instrument of making the entire satellite a munition, identify the critical technologies and components that the U.S. needs to protect and put those on the munitions list.
- Remove from the Munitions List commercial communications satellite systems, dedicated subsystems, and components specifically designed for commercial use; provide safeguards by having Defense Department identify critical space components and technologies that should always require licensing and referral. Once the critical technologies are identified, the overall satellite can be controlled under the dual-use regime with the safety net that key components are still protected under the ITAR regime.
- Annually review the appropriateness of designating specific satellite and other space systems, components, and capabilities as Munitions List items based on criticality of items and on their availability outside the U.S. The technology changes rapidly enough that a periodic and constant review is necessary.
- Additionally, Congress could amend the legislation related to satellite export licensing and adopt some of the best practices being used in other processes – set timelines, technology thresholds, de minimus rules, and special licensing vehicles. To the extent that the Congress does not want to change the overall legislation, it could be amended to embed best practices that permit a smoother functioning of the export control regime.
- The Secretary of Defense and NASA Administrator, in addition to the Secretary of State, should have the authority to grant real-time, case-by-case, specific time period exemptions for anomaly resolutions deemed to be in the national interest based on criteria from the National Space Policy.

- Create a special program authority to permit timely engagement of U.S. participants in multinational space projects. A broad program license could permit more engagement in cooperative programs.
- Increase the dollar threshold for satellite exports Congressional notification and establish a mechanism to allow the threshold to adjust with inflation.
- Relevant space-related government agencies should collaboratively undertake an annual assessment of their industrial base.

I thank you for allowing me to present our study and I thank you for taking up this very important topic. Thank you for the opportunity to testify, and I look forward to your questions.