



SPACE FOUNDATION

ITAR and the U.S. Space Industry

Executive Summary

The United States currently possesses the largest and most active space economy in the world. It is also the most technologically advanced, although other nations have excelled in certain aspects of space technology.

This leadership position is being challenged as other spacefaring nations seek to develop their capabilities in cooperation or in competition with the United States. The U.S. space industry is concerned that its competitiveness is being undermined by the export control regime that regulates trade between the U.S. and the rest of the world.¹ It is difficult to quantify the total effect of export controls on the space industry, as much of the evidence presented in the past has been anecdotal in nature.

The Space Foundation conducted a survey in 2007 to provide data on the effect of the International Traffic in Arms Regulations (ITAR), which govern the export of space technology. The intention was to see if ITAR had affected the business practices and the cost structures of the space industry in a significant way. The survey contained both quantitative and qualitative questions and the results showed that most responding U.S. companies are aware of the need for protecting certain technologies but they do not believe that ITAR is working the way it should. The results also indicated that smaller respondent companies are more likely to feel adverse effects from ITAR than large companies. This is a matter of some concern, as lower-tier contractors are a significant source of the new technology and innovation that enables the United States to remain a world leader in space. By continuing to operate an export control regime designed during the Cold War, the United States reduces the competitiveness of its space industry in the global market and potentially harms the domestic innovation processes that enable U.S. space leadership.

It is not only the space industry that has concerns about the process, but also military and civilian government personnel. Deputy Secretary of Defense Gordon England has expressed the view that technology exports should be encouraged because “in this world of coalition warfare and building partnership capacity, it’s essential for us and our friends and allies to have greater interoperability ... even with vastly different levels of investment.”² At every level of military activity, from discussions of interoperable hardware designs to battlefield support, the unintended consequences of ITAR can affect the ability of troops and their support personnel to carry out vital tasks.

The Space Foundation does not suggest that ITAR be abolished, as there are certain space technologies that the United States must protect. However, both the regulations and the processes of implementation need to be modernized to reflect the current global market, the state of space technology, and the increasing pace of innovation. With this goal in mind, we submit the following issues and recommendations for consideration by government and industry.

¹ U.S. Department of Defense and Department of Commerce, *Defense Industrial Base Assessment: U.S. Space Industry. Final Report* (Dayton, OH, 2007), 14.

² “Deputy Secretary of Defense Urges Easing U.S. Export Controls,” *Satellite Today*, May 19, 2008, <http://www.satellitetoday.com/smd/23097.html> (accessed May 20, 2008).

Issue

The export licensing process is lengthy, unpredictable, and inefficient. The expertise required to understand the technical details often lies outside the State Department and consultation is time-consuming.

- » The State Department should hire several employees with space expertise when fulfilling the staffing requirements under consideration by Congress.
- » The Senate should ratify the defense trade treaties with the United Kingdom and Australia, enhancing collaboration with two strong U.S. allies and decreasing the volume of licensing requests substantially.
- » The enforcement of ITAR should shift its focus from a system that regulates individual transactions to a system that reviews the scope of the entire project.

Issue

ITAR restricts the ability of U.S. firms to compete because foreign companies do not operate under equal restrictions. Technology remains on the United States Munitions List (USML), even when it is commercially available in other countries, because lists of critical U.S. military technologies are seldom updated.

- » When reviewing the USML and ITAR, the State Department should take into account the availability of space technology in the global market. U.S. companies should be allowed to compete freely to sell goods and services that are not materially different from those offered by international competitors. In addition, exports should only be governed by ITAR if they represent a technological advantage that is militarily significant.
- » A validated end-user program should be created for ITAR-controlled exports, enabling transactions that require exporters to notify the State Department instead of applying for a license. This would enable U.S. firms to offer competitive bids in a timely manner to companies that had been approved by the U.S. government previously.

Issue

Small firms do not have sufficient resources to comply with ITAR so the cost of compliance is a barrier to entry; this is a concern since lower-tier companies are a major source of innovation. Regulations also deter or delay collaboration with foreign partners, increasing the financial burden on a sole firm.

- » Any plans to use export licensing fees to sustain additional duties by the State Department should avoid placing undue financial burden on lower-tier suppliers.
- » Transfers of technology between U.S. and overseas divisions of the same company should not require a license, provided all sites are ITAR-compliant.
- » A database of recipients should be made available to exporters, enabling them to see which customers have been granted access to certain categories of ITAR-controlled exports and which customers require greater scrutiny for certain transactions. This database would also provide incentives for foreign entities to maintain ITAR compliance, since a negative listing would decrease their chances of doing business with U.S. companies.
- » The licensing process should be as transparent as possible, without harming national security or the competitiveness of the companies involved. This will enable the industry to engage in regular dialogue with the State Department to reach a better consensus regarding what needs to be controlled and how to make the process more efficient.

Introduction

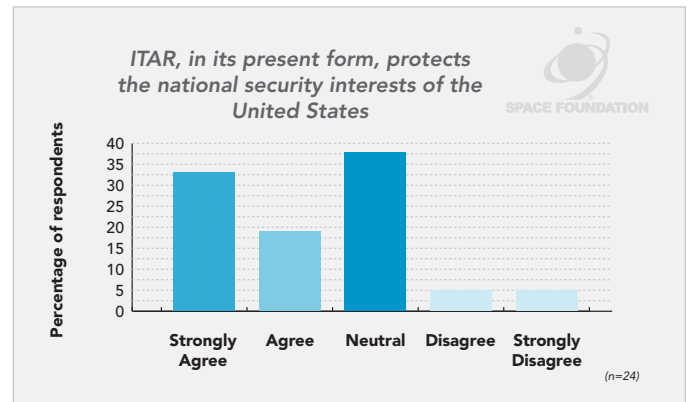
In the United States, exports of space products and services fall under the jurisdiction of the Department of State regardless of their purpose, whether it is military, civil, commercial, or academic. The International Traffic in Arms Regulations (ITAR) which govern these transactions are considered by some members of the space industry to be a government-imposed hindrance that prevents the United States from reaching its full potential as a leader in global space activity.³

Many feel that the export of technical data, defense services, technology, and commodities is overly restricted under the current export control regime, in which individual licenses are required for each transaction and minimal exceptions are made. They believe that the export control process should be routine and transparent with timely and consistent license application procedures, upholding vital national security safeguards and enabling continued U.S. technological and economic competitiveness.

Recent initiatives by the Administration and Congress have addressed some of these concerns, as well as laying the foundation for future reforms. This is a positive sign, but it remains to be seen whether the implementation of these measures will truly make a difference in the way that the export process works. The “problem” of ITAR for the space industry is not an insurmountable one, but it may be extremely difficult to address unless the parties with a stake in the matter have a common understanding of the issues. Without this shared perspective, efforts to modernize the export process are likely to add to the complexity of an issue that is already complicated. The results of the Space Foundation’s ITAR survey, presented below, are intended to help inform the debate about how to shape the relevant policies and guidelines for maximum efficiency and effectiveness.

Findings and Recommendations

The concerns of the U.S. space industry with regard to ITAR encompass issues of competitiveness, access to the global market, technological development, and leadership in the space domain. The industry recognizes that there are valid national security concerns with regard to space technology that ITAR is trying to protect. Of the respondents to the Space Foundation’s ITAR survey, more than half believed that ITAR, in its present form, protects the national security interests of the United States. This corresponds closely with a 2006 survey of executives in the broader aerospace and defense community, which revealed that two out of three believed that the export control system effectively protected U.S. national security interests.⁴ However, the export control process is not *fully* protecting the interests of the United States because it is damaging the health of the space industrial base.



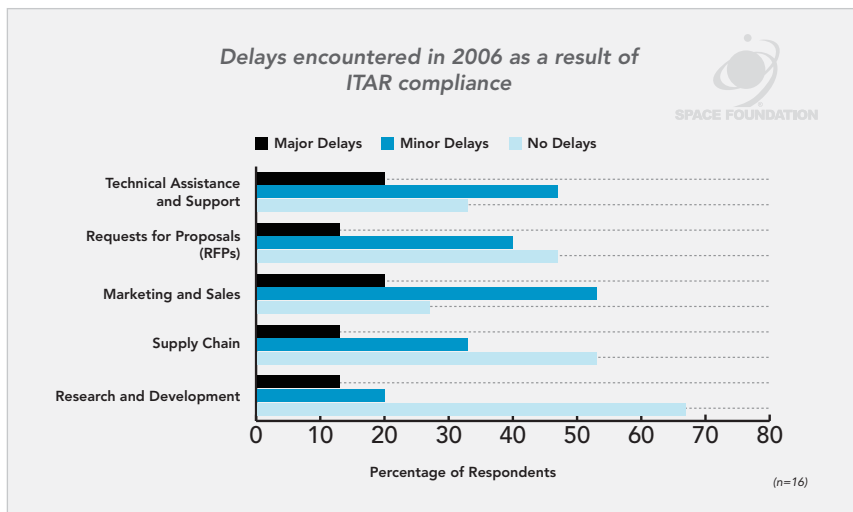
One of the reasons that the U.S. space industry finds fault with the current regulatory regime is because it perceives ITAR as a barrier to fair competition. A U.S. government study conducted in 2007 revealed that export controls were considered to be the number one barrier to entry for U.S. firms attempting to penetrate foreign markets, with foreign purchasing preferences ranked as

³ For the sake of simplicity, “space industry” includes the government and academic sectors in addition to the commercial interests that the term implies. For instance, NASA must comply with ITAR when engaged in projects with international partners. In some cases, as with the International Space Station, the process is expedited due to the safety concerns involved in human spaceflight, although these exceptions are often difficult to negotiate.

⁴ Marty Bollinger and Joshua M. Boehm, *Moving Toward a Faster and More Predictable Process of Licensing Defense Articles and Services for Export: Recommendations for Government and Industry* (Booz Allen Hamilton, 2006), 1.

a distant second.⁵ Since foreign firms do not have to deal with an equivalent set of export regulations, it gives them a competitive advantage in the global marketplace. In the fast-moving world of the telecommunications industry, a company might issue a request for proposals with a significantly shorter timeline than would allow a U.S. company to receive the necessary approval from the State Department's Directorate of Defense Trade Controls (DDTC) to bid on the project. Foreign companies may view this as regrettable if they are interested in buying from the United States, but foreign governments sometimes intentionally set deadlines that they know U.S. companies will be unable to meet due to ITAR, thereby effectively creating a trade barrier and protecting their own space industries without the risk of diplomatic repercussions.⁶ In this way, the security measures of the United States can have a negative effect on the health of its domestic space industry, even in circumstances where the export would have been approved by the U.S. government eventually.

The length of the licensing process has long been a cause for complaint; there are several factors that contribute to the delays. Due to the nature of the items and services being traded, the expertise required to understand the technical details often lies outside the State Department and consultation is time-consuming. However, there have been some positive actions on the part of the government in this regard. New management of DDTC since May 2007 has been instrumental in reducing the backlog of some 10,000 licensing applications. On January 22, 2008, President Bush signed National Security Presidential Directive 56 (NSPD 56) on defense trade reform. NSPD 56 directed the State Department to complete its review and adjudication of licensing applications within 60 days of receipt, unless national security exceptions are applicable.⁷



The U.S. House of Representatives supported and expanded upon NSPD 56 in May 2008 with H.R. 5916, the *Security Assistance and Arms Export Control Reform Act of 2008*.⁸ The bill acknowledged several of the problems inherent in the export control regime and prescribed changes to the licensing process. Government statistics showed the median processing time for arms export cases (of which space technology forms a subset) had doubled over the period from 2002 to 2006.⁹ Space-related deals are typically complex and may require multiple licenses at various stages of the project as modifications are made and as construction of the final product progresses. This opens the door to cumulative delays and the House recognized that the backlog in applications and the long processing times “led to an impairment of United States firms in some sectors to conduct global business relative to foreign competitors.”¹⁰

The legislation under consideration by Congress determined that DDTC should have at least one licensing officer for every 1,250 applications.¹¹ It also set forth a minimum number of personnel to review applications for commodity jurisdiction (i.e., whether or not something is controlled by ITAR). According to an estimate from the Congressional Budget Office, an

⁵ U.S. Government, *Defense Industrial Base Assessment*, 14.

⁶ John Hillery, *U.S. Satellite Export Control Policy*, Center for Strategic and International Studies, http://www.csis.org/media/csis/pubs/060921_sat_export_controls.pdf (accessed August 4, 2008).

⁷ U.S. Department of State, “Policy on Review Time for License Applications,” *Federal Register* 73, no. 73 (April 15, 2008): 20357.

⁸ The House of Representatives passed H.R. 5916 on May 15, 2008. The Senate had not yet considered the bill at the time this paper was written.

⁹ U.S. House of Representatives, *Security Assistance and Arms Export Control Reform Act of 2008*, 110th Cong., 2d sess., 2008, H.R. 5916, 7.

¹⁰ House of Representatives, *Export Control Reform Act*, 8.

¹¹ House of Representatives, *Export Control Reform Act*, 21. This is not intended to be a quota for each licensing officer since licenses vary in complexity. However, it is supposed to ensure that DDTC's staffing levels are appropriate to the volume of licenses.

¹² House Committee on Foreign Affairs, *Report on H.R. 5916, the Security Assistance and Arms Export Control Reform Act of 2008*, 110th Cong., 2d sess., 2008, H. Rep. 110-626, 25.

additional 35 licensing officers would need to be hired in order to meet these thresholds.¹²

Recommendation

Due to the increasing technical complexity of licensing applications, the State Department should include several employees with space-related expertise in its plans to fulfill the staffing requirements under consideration by Congress.

On the diplomatic front, the U.S. Senate should ratify the treaties with the United Kingdom and Australia and the government should seek out other possibilities for cooperation with allies. If wars in the future are to be multilateral affairs, it is essential for the U.S. military to achieve interoperability with the forces supplied by allied nations. The battlefield is the worst place to accomplish this task; it is safer for the troops if they are prepared beforehand to work with their allies when the time comes. Ideally, this would involve joint training exercises, personnel exchanges, and shared classes in military doctrine. It would also be beneficial if the equipment of U.S. allies were compatible with U.S. space systems or at least capable of being easily adapted for interoperability. Unfortunately, it is difficult to achieve any of these steps in the environment of distrust that is engendered by the U.S. approach to export controls for space technology, which encompasses technical information as well as hardware. It would be regrettable if the United States was forced to engage primarily in unilateral action because it was incapable of integrating allied forces into its battlespace.

A different approach to licensing for the United Kingdom and Australia should not be considered as a reward or an incentive for providing assistance in the future; it is a practical change to make in light of the trade relationship that already exists. In 2007, the State Department processed 8,000 licenses for these two nations, 99 percent of which were approved.¹³ By changing from a transaction-based system to an end-user system of approval, more opportunities for cooperation would arise and close U.S. allies would have prompt access to the equipment and support they need to engage in future coalition operations.¹⁴ Companies and agencies would be able to perform the same tasks that they are already doing, but in a more timely and efficient manner, which increases the likelihood of undertaking more projects of mutual benefit.

Recommendation

The Senate should ratify the defense trade treaties with the United Kingdom and Australia. This would enhance collaboration with two strong U.S. allies and it would decrease the volume of licensing requests substantially.

The Administration is not seeking similar treaties with other countries because there are no other candidates with whom the U.S. government has a similar “special relationship.” In response to the difficulty of doing business with U.S. space companies under the constraints imposed by ITAR, some foreign companies have begun to advertise their products as “ITAR-free,” highlighting the fact that potential customers will not have to navigate the complex and demanding terrain of ITAR compliance.¹⁵ This is a particularly strong selling point for foreign companies that provide components for spacecraft. It is more convenient for a foreign satellite builder to use ITAR-free components because it will then be able to sell the final product to whomever it pleases (in compliance with the domestic laws of its home nation). For example, several European governments are financing the development of a commercial telecommunications satellite that will be available both with and without ITAR-controlled components. The ITAR-free version is expected to be more expensive, but customers may see this as a viable tradeoff for avoiding

¹³ Frank Ruggiero, interview by Vago Muradian, Washington, DC, April 21, 2008, <http://www.state.gov/t/pm/rls/rm/104012.htm> (accessed August 5, 2008).

¹⁴ Expedited processing is available for items urgently needed by coalition troops in Iraq and Afghanistan, but this does not cover long-term cooperative projects which can fall behind schedule due to a slow export system. This adds to the financial cost for the parties involved. A reduction in unnecessary export-related delays would be a prudent fiscal policy.

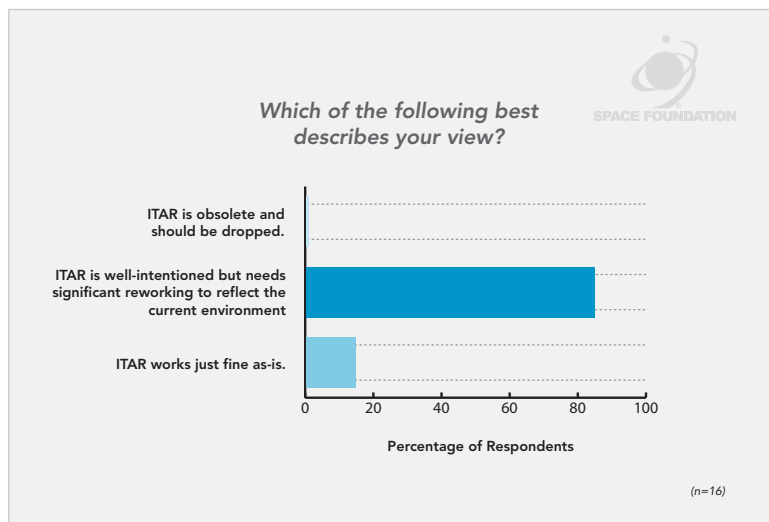
¹⁵ Wolfgang Demisch, “ITAR’s End,” *Aviation Week & Space Technology*, July 17, 2006.

¹⁶ Peter B. de Selding, “ITAR-Free Version of Small GEO Planned,” *Space News*, May 28, 2008, <http://www.space.com/spacenews/marketmonitor/SmallGEOweb052808.html> (accessed August 5, 2008).

the prospect of ITAR-related delays.¹⁶ It would also enable customers to take advantage of low-cost Chinese launch services, which are currently off-limits for products controlled by ITAR.

The legislation under consideration by Congress instructs the President to submit a report on satellite export controls, which takes into account “the extent to which comparable satellites and related items are available from foreign sources without comparable export controls.”¹⁷ The space industry would welcome such a review, both for satellites and for other space goods and services, as the majority of the industry is of the opinion that ITAR needs significant reworking to reflect the current environment.¹⁸

The terms of the treaties between the United States and its allies, the United Kingdom and Australia, hint at a possible solution. If it were possible for DDTC to issue license for a particular project or enterprise rather than overseeing each distinct detail, then the State Department could review a proposed deal and approve it with the proviso that further review would be necessary only if the terms of the deal changed according to a specific set of conditions. This would remove the necessity for multiple licensing applications unless the scope of the project went beyond the limits imposed by DDTC. Alternatively, a “validated end-user” system could be implemented in which it is understood that the recipient of technology is in compliance with U.S. security requirements, thereby promoting joint business ventures between these trusted foreign partners and U.S. companies.



Recommendation

The enforcement of ITAR should shift its focus from a system that regulates individual transactions to a system that reviews the scope of the project.

Recommendation

A validated end-user program should be created for ITAR-controlled exports, enabling transactions that require exporters to notify the State Department instead of applying for a license.

If the goal of export control is to prevent sensitive technology from falling into the hands of parties hostile to the United States, then the government needs to define the categories of goods and technical knowledge more clearly and appropriately. The U.S. military should assess the current state of military technology and determine what is inappropriate for export. As has been mentioned previously, one part of this assessment should take into account the availability of spacecraft components on the global market so as not to prevent U.S. companies from selling goods that could have been purchased from a foreign competitor. On a broader scale, the list of controlled items should be narrowed significantly to include only the parts of a spacecraft that can truly be said to be sensitive technology.

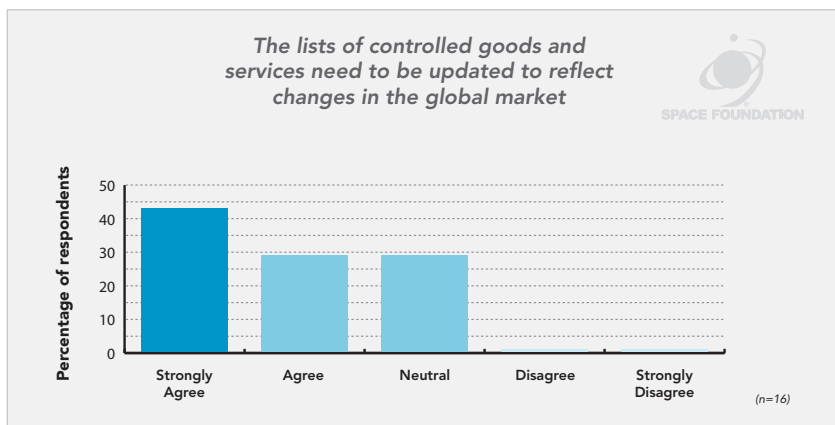
These lists have not been subject to regular review in the past, so they have not been kept in sync with the reality of the marketplace. In addition, the definition of “military” usage as opposed to “dual-use” is often unclear, but the penalties for non-compliance are so high that companies are often inclined to submit excessive license applications, many of which are improperly written, thereby contributing to the workload (and backlog) at DDTC.¹⁹ The U.S. space industry understands that there are

¹⁷ House of Representatives, *Export Control Reform Act*, 42.

¹⁸ U.S. Government, *Defense Industrial Base Assessment*, 43.

¹⁹ Bollinger and Boehm, *Moving Toward a Faster Process*, 3-4.

some things that must be protected, but it frustrated by the excessive resources that go into protecting things that have no strategic military significance.²⁰ It is encouraging to note that the House of Representatives wants the Secretary of State to review the United States Munitions List (USML) and ITAR, *with the assistance of United States manufacturers and other interested parties.*²¹ The purpose of this review is to determine which technologies warrant different or additional controls.

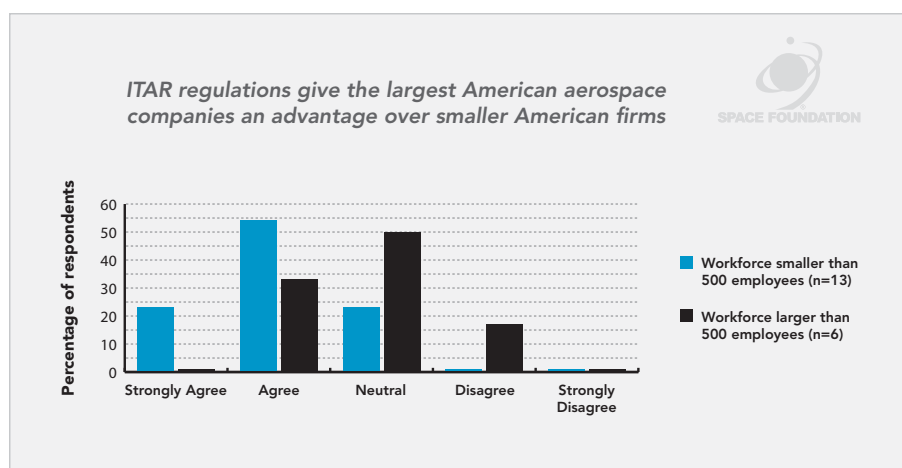


Recommendation

When reviewing the USML and ITAR, the State Department should take into account the availability of space technology in the global market. U.S. companies should be allowed to compete freely to sell goods and services that are not materially different from those offered by international competitors. In addition, exports should only be governed by ITAR if they represent a technological advantage that is militarily significant.

In terms of creating an uneven playing field, ITAR does not only engender a disparity between domestic and foreign companies, but it also imposes costs upon U.S. companies unequally. A large prime contractor is likely to have an entire department of staff working on ITAR compliance for the company as a whole, and these people have the experience necessary to handle any space-related ITAR paperwork. By contrast, second- and third-tier suppliers are more likely to be at a disadvantage as they may not have the personnel to ensure that everything is being done in accordance with ITAR. The proportional cost of ensuring compliance is much higher for them, up to eight times that of a first-tier supplier, and this is a significant concern since many lower-tier suppliers have relatively small profit margins.²²

The extra costs imposed by ITAR constitute a barrier to entry for small companies, thereby discouraging them from seeking to expand their customer base on a global scale. Consequently, they rely on U.S. domestic space activity, which is cyclical in nature. If it were easier to compete globally, these small companies would have a better chance of survival during the lean times in the U.S. market. Lower-tier suppliers play a significant role in innovation, so the loss of these companies could lead to a decline in the development of new technology.²³



An example of a subsection of the space industry that is facing difficulty is the entrepreneurial sector, comprised of the

²⁰ U.S. Government, *Defense Industrial Base Assessment*, 42-44. For additional information on the discrepancy between critical technologies and export controls, see: U.S. Government Accountability Office, *Defense Technologies: DOD's Critical Technologies Lists Rarely Inform Export Control and Other Policy Decisions*, GAO-06-793 (Washington, DC, 2006).

²¹ House of Representatives, *Export Control Reform Act*, 25.

²² U.S. Government, *Defense Industrial Base Assessment*, 36.

²³ U.S. Government, *Defense Industrial Base Assessment*, 28.

companies which are developing commercial passenger spacecraft and orbital habitats. Often funded privately, these companies are under extreme pressure to keep their costs down and they would like to work with foreign suppliers whenever it is more cost-effective to do so. However, the barriers to communication imposed by ITAR make it a slow and arduous process to provide technical requirements to the foreign suppliers and to engage in follow-up discussions that could improve the safety and reliability of the end product. One such entrepreneur, Elon Musk, is working to provide an orbital launch vehicle that is intended to conduct flights for NASA and the Department of Defense, among other customers. In public statements, Musk has emphasized the importance of minimizing the regulatory burden on startup companies and has questioned the wisdom of government-imposed obstacles to cooperation with companies in trusted nations such as New Zealand, the United Kingdom, and Canada.²⁴

The House of Representatives has suggested that DDTC examine the possibility of placing itself on a 100 percent self-financing basis.²⁵ This is potentially problematic for smaller suppliers, which may rely on a high volume of relatively low-value sales to sustain themselves. Depending on the mechanism for assessing licensing fees in order to finance DDTC, lower-tier suppliers may find the cost of international sales too high to contemplate. According to the U.S. government's industrial base assessment of the space industry, some of these small companies have already self-eliminated from foreign markets because of ITAR restrictions and the unwillingness of foreign customers to deal with ITAR-related bureaucracy.²⁶ An increase in licensing costs is likely to reinforce this behavior.

Recommendation

Any plans to use export licensing fees to sustain additional duties by the State Department should avoid placing undue financial burden on lower-tier suppliers.

The barriers to communication imposed by ITAR exist not only between U.S. companies and foreign entities, but also within companies that have sites located around the world. By imposing barriers that affect intercompany operations, the U.S. government is discouraging the space industry from harnessing the talent and expertise that exists in foreign countries. Companies are able to apply for licenses to conduct specific joint ventures involving their foreign offices, as would be the case for any foreign partnership; however, it may be more efficient to adopt a long-term solution that allows for regular interchanges. If a company is willing and able to meet the conditions of ITAR at its foreign sites, it makes sense to permit continuous collaboration, possibly within a certain set of parameters established by DDTC in advance.

Recommendation

Transfers of technology between U.S. and overseas divisions of the same company should not require a license, provided all sites are ITAR-compliant.

If the export system makes the transition from transaction-based approval to end-user approval, it will be necessary to provide the U.S. space industry with the information it needs to determine who it can trade with. The U.S. government currently maintains lists of countries, entities, and persons who are prohibited from receiving ITAR-controlled goods and services. A corresponding list could be created of trusted agents who have been verified as ITAR-compliant. This would allow U.S. companies to see which foreign entities are easiest to trade with and it would also help lower-tier suppliers to find business opportunities overseas, thereby funding the creation of new technology for use domestically. Ideally, the list would be updated as licenses are approved, allowing the space industry to gain a real-time picture of which entities are trusted by the government.

²⁴ Jeff Foust, "Two scenarios and two concerns for personal spaceflight," *The Space Review*, April 25, 2005, <http://www.thespacereview.com/article/362/1> (accessed May 2, 2008).

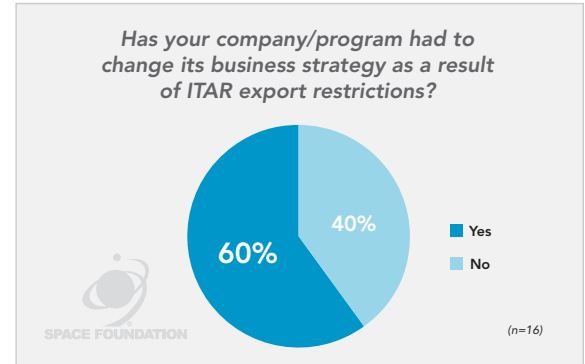
²⁵ House of Representatives, *Export Control Reform Act*, 34.

²⁶ U.S. Government, *Defense Industrial Base Assessment*, 13.

Recommendation

A database of recipients should be made available to exporters, enabling them to see which customers have been granted access to certain categories of ITAR-controlled exports and which customers require greater scrutiny for certain transactions. This database would also provide incentives for foreign entities to maintain ITAR compliance, since a negative listing would decrease their chances of doing business with U.S. companies.

The U.S. space industry is interested in working with the government on the issue of export controls, but such efforts will not succeed unless there is a free flow of information in both directions. Companies can supply expertise and advice, but they also need to know the reasoning behind government decisions. If licensing decisions are made available to the space industry, with safeguards in place to protect industrial secrets and competitive data as necessary, then the industry as a whole will be able to adapt its business strategy in the interest of efficiency while still complying with (modernized) ITAR. This is nothing new for the industry – most companies have already had to adopt strategic changes due to the present export regime – but companies would be able to make their decisions based on a better understanding of the government’s behavior. The information would also enable the industry to better engage with the government on a regular basis to discuss the changing face of the global market and the appropriate updates to ITAR that should follow.



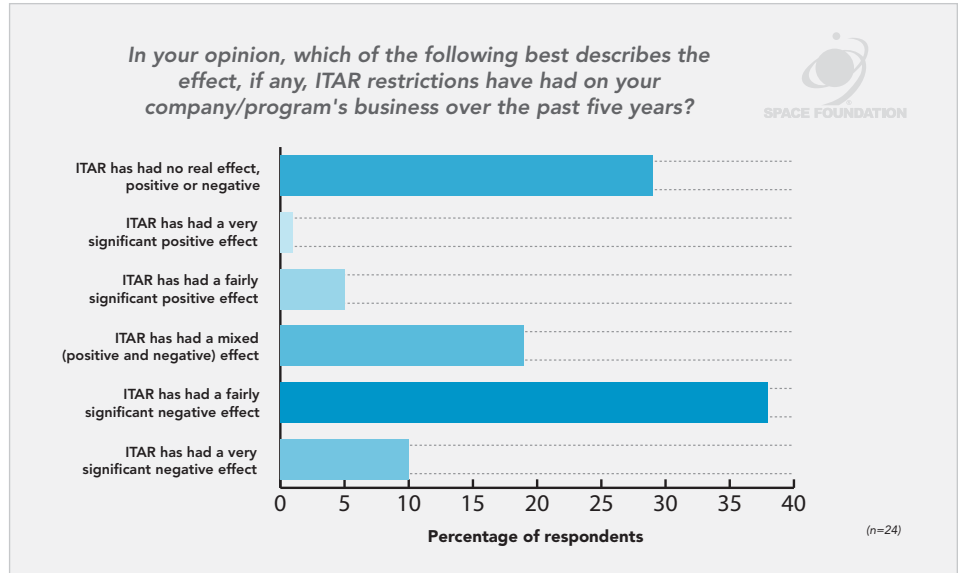
Recommendation

The licensing process should be as transparent as possible, without harming national security or the competitiveness of the companies involved. This will enable the industry to engage in regular dialogue with the State Department to reach a better consensus regarding what needs to be controlled and how to make the process more efficient.

Conclusion

On the political front, the space industry needs to do a better job communicating the message that it is an important commercial and national security asset to the nation. Space advocates must work to build an understanding within the government that there should be a balance between necessary export restrictions and the health of the industry. The national security implications of an enfeebled and uncompetitive domestic space industry must be made clear, in order to explain why an overly restrictive export control regime can ultimately do as much damage to national security as a lax regulatory system. If the expertise of the U.S. space industry is allowed to deteriorate, or if it is slowed to the point where other nations catch up (and this has already happened in some areas), then the United States is effectively ceding the dominant position in space that it has enjoyed for some time. Considering the dependence of modern militaries on space assets, especially the U.S. military, the danger of falling behind in terms of technological progression is not to be taken lightly.

The control of space exports under the International Traffic in Arms Regulations is a contentious issue that pits national security concerns against the desire to cooperate with foreign entities for purposes of profit or scientific research. By working together, it should be possible to create a regulatory environment that protects militarily critical technologies and technical expertise, while allowing commerce and international partnerships to flourish and the space industry to prosper.



The difficulty lies in overcoming the arguments of parties on both sides who have become entrenched in their positions and who are more willing to recount the injustices or misdemeanors of the past than to work toward a better future. To succeed, it will be necessary to muster the political will of the Executive Branch to oversee the necessary alterations in the regulatory process, and the cooperation of the Legislative Branch with regard to adjusting the laws to allow the State Department more latitude in terms of determining the trustworthiness of end-users. The space industry must also play a role in the process and it will need to make solid information available to policymakers so that any policy changes will be helpful and well-reasoned.

Appendix A – Additional Information about ITAR

The United States regulates the exports of certain goods and technologies through several laws: the 1979 Export Administration Act, for controlling the export of dual-use items and technologies, and the 1976 Arms Export Control Act, which governs the trade in defense articles, services, and technical data. The U.S. government publishes two lists to identify those goods and services which are subject to export controls. The Commerce Control List, for dual-use items, is managed by the Department of Commerce under the Export Administration Regulations, while the United States Munitions List (USML) for military items and munitions is managed by the Department of State's Directorate of Defense Trade Controls (DDTC) under the International Traffic in Arms Regulations (ITAR).²⁷

Space technology is separated into two distinct categories within the USML, depending on whether it is associated with launch vehicles or spacecraft.

Category IV of the USML contains

- » Rockets, launch vehicles (including missiles), and advanced composite materials
- » Launch vehicle powerplants
- » All specifically designed or modified components, parts, accessories, attachments, and associated equipment for the articles in this category
- » Technical data and defense services directly related to the articles in this category

Category XV contains

- » Spacecraft, including all common types of satellites
- » Ground control stations
- » GPS receiving equipment specifically designed for military use
- » A variety of high-performance components that would be suitable for use in a spacecraft
- » Spacecraft systems and associated equipment²⁸

It is evident from these lists, particularly the items that lay claim to “associated equipment,” that it is practically impossible to find a space item that would not be controlled by ITAR. The exception would be a component that was originally designed for a non-space purpose and which had not been modified in any way before being incorporated into a spacecraft.

In light of the all-encompassing nature of ITAR, it is essential for the space industry to understand the requirements for complying with the regulations. In general, any person or company who intends to export a defense article must obtain the approval of DDTC prior to the export. Collaborative efforts that involve the exchange of a defense service, technical data or assistance, or manufacturing know-how require a license called a Technical Assistance Agreement. The assistance and know-how is what distinguishes an “Agreement” from other authorizations issued by the Department of State. In either case, ITAR broadly covers the exports of data, know-how, manufacturing, defense articles, and hardware.

The fact that ITAR covers technical knowledge in addition to hardware can make things difficult for the space industry. If knowledge is transferred to a non-U.S. citizen, either intentionally or unwittingly, this is a “deemed export,” meaning that the information is considered to have been exported even if the recipient has no intention of leaving the country or communicating the knowledge to a third party. Companies can sidestep the issue to some extent by hiring only U.S. citizens, but they must deal with the ITAR paperwork if they wish to do business with foreign entities or if they wish to employ non-U.S. citizens. Similarly, foreign business partners are required to disclose and receive approval for their employees who would have access to information

²⁷ Government Accountability Office, *Export Controls: Challenges Exist in Enforcement of an Inherently Complex System*, GAO-07-265 (December 2006), 5.

²⁸ United States, Government Printing Office, “The United States Munitions List,” *Code of Federal Regulations*, 22 CFR 121.1. For the sake of brevity, these descriptions have been paraphrased. The intent is to provide a general description rather than a detailed list.

that is ITAR-controlled. This licensing process can be quite time-consuming and expensive for both the U.S. company and the foreign partner.

Licenses under the ITAR are authorized on a “transactional” basis, which means that a license is required for each separate instance of export, for each different item, or different destination. In addition, jurisdiction extends to any U.S. part or component on a foreign product or system, as well as to third-party exports by the intended recipient. Details required for the application include the value of the agreement, the nature of the export, a signed agreement between the exporting and importing parties, and, as has been mentioned, the countries of all third-party nationals that may be employed by the foreign signatory. Once the license application has been submitted, any changes (e.g., the addition of new parts or components, transfer of additional data, extension of term of the agreement, or increase of the value of the agreement) require an application for an amendment to the license.

Exceptions to ITAR are minimal, whether for an individual transaction or for a particular end-user. Most U.S. allies or NATO countries require a license and some country exclusions require Presidential approval for the proposed export. If the “defense articles or services” are valued at \$100 million or more, and if the intended recipient is not a member of NATO or a close ally, then congressional approval is required.²⁹ The financial threshold for allies is higher, but the fact that telecommunications satellites often cost several hundred million dollars means that the majority of them must face congressional scrutiny. Congress is required to reach a decision on a deal within 30 days of its submittal, but the common practice is to wait until all other issues related to the contract have been settled before submitting it to Congress, thereby lengthening the process. It would be considerably more efficient if the notification requirement could be fulfilled concurrently with the license application.

²⁹ H.R. 5916 raised this threshold – it used to be \$50 million. As of May 29, 2008, the Bill had been passed by the House of Representatives and had not yet been considered by the Senate.

Appendix B – Historical background

During the Cold War, the policy of the United States was that all exports of space-related goods and technologies be regulated by the State Department as munitions. This policy made sense for national security reasons at a time when the United States and the Soviet Union used space technology as a means of demonstrating technological superiority and as a means of keeping watch over each other's military assets. As relations began to thaw, however, U.S. companies saw an opportunity to expand their business and they lobbied the government to ease some of the restrictions that were in place.

In 1988, President Reagan lifted the ban on the use of Chinese launch vehicles for commercial satellites, thereby allowing American companies to take advantage of significantly lower launch prices.³⁰ During the 1990s, President Bush made a similar decision with regard to Russia, setting the stage for joint ventures, such as International Launch Services.³¹ A subsequent presidential decree in 1992 ordered the removal of dual-use items from the USML unless they posed a clear danger to national security. Industry trade associations lobbied for the inclusion of communications satellites in the group of items to be removed, pointing out that the United States was the only nation that treated these satellites as munitions.³² As a result, the State Department transferred jurisdiction of some commercial communications satellites to the Department of Commerce in 1992, provided that the satellites did not exceed certain technical specifications that would make them “military-grade.”

In an effort to complete the changeover of communications satellites from State to Commerce, an interagency group called the Trade Promotion Coordination Committee submitted a report in 1993 that advocated an administrative review of dual-use items that remained on the munitions list. This was followed by a review from an interagency Comsat Technical Working Group, which attempted to create a better definition for militarily sensitive technologies. The recommendation of this group was for the State Department to reduce and tighten its list of sensitive technologies, but it also advised against transferring all communications satellites to Commerce. This decision did not please the Department of Commerce, which subsequently argued the matter before the National Security Council and President Clinton. Eventually, President Clinton ordered the transfer of all communications satellites, requiring Commerce to consult with the Departments of State, Defense, and Energy, as well as the Arms Control and Disarmament Agency before issuing licenses.³³ The change of jurisdiction was completed by October 1996. It should be noted, however, that the State Department continued to control the related communications *technologies* and the rest of the space items on the USML remained under its jurisdiction.³⁴

This division of responsibility for communications satellites between the two departments proved to be problematic when two satellites were lost during launch attempts in China in 1995 and 1996. In an attempt to determine the cause of the rocket failures, China requested and received information from the U.S. companies that were involved in the manufacturing of the satellites. The purpose of these requests was ostensibly to help create an analysis of the failure to fulfill insurance requirements. A Department of Justice investigation into this transfer of technical data to China determined that the Department of Commerce should have consulted with the State Department before authorization. The U.S. companies — Lockheed Martin, Loral, and Boeing — paid a fine of \$65 million, but it was not possible to prevent the incident from being used as fodder for opponents of President Clinton's approach to export control policy.³⁵

³⁰ George Abbey and Neal Lane, *United States Space Policy: Challenges and Opportunities* (Cambridge, MA: American Academy of Arts and Sciences, 2005), 8.

³¹ International Launch Services, “ILS Legacy,” <http://www.ilslaunch.com/ils-legacy> (accessed May 2, 2008). This partnership originally involved Lockheed Corp. and two Russian companies: Khrunichev State Research and Production Space Center, and RSC Energia. Lockheed later sold off its share in the business. ILS came to be entirely Russian-owned in May 2008.

³² Ryan Zelnio, “A short history of export control policy,” *The Space Review*, January 9, 2006, <http://www.thespacereview.com/article/528/1> (accessed April 16, 2008).

³³ Ibid.

³⁴ Abbey and Lane, *United States Space Policy*, 8.

³⁵ Ibid., 9.

In response to the situation, Congress established a select committee in 1998 (known as the Cox Commission) to complete an inquiry into the transfer of technology, information, goods, or services to China that may have enhanced their missile or intelligence capabilities. The Commission also reviewed U.S. government and private sector behavior with respect to any such matters. In response to the Cox Commission's report, Congress returned jurisdiction to the State Department with the fiscal year 1999 Defense Authorization Act, whereby all satellites and satellite technologies were once again placed on the USML and exports were governed by ITAR. The Act also decreed that the President must notify Congress 15 days prior to a transfer of satellite technology to China and must also verify that the transfer would not harm U.S. launch companies or aid the development of Chinese missile technology.³⁶

In the years that followed, there have been occasional attempts to ease the restrictions imposed by ITAR, especially with regard to close allies. However, these efforts have been staunchly opposed by Members of Congress who advocate a tight export control policy in the interest of national security. For example, Britain and Australia have long sought exemptions to U.S. export controls, but U.S. presidential support and the precedent of similar exemptions for Canada were insufficient to overcome the objections of certain elected representatives. This opposition was due to concerns over perceived flaws in the export control policies of Britain and Australia and the potential for technology transfers to third countries. These concerns apply to all items on the USML, not just space technology.

In June 2007, President Bush and Prime Minister Tony Blair signed a defense trade treaty that will ease the passage of defense goods and services between the two nations if it is ratified by the U.S. Senate. The Defense Trade Cooperation Treaty would not remove congressional oversight for arms sales, but it would remove the export licensing requirements for "an approved community" of U.S. and British entities. An individual, company, or facility would have to be approved by the governments of both nations before it could take advantage of the exemptions set forth in the treaty.³⁷ Since the State Department already grants its approval to the vast majority of licensing applications for destinations within the United Kingdom, the effect of the treaty will be to reduce the time and effort required for each transaction, thereby encouraging transatlantic partnerships. A similar agreement with Australia, signed in September 2007, is another step toward the relaxation of ITAR, but it is unlikely that there will be other nations whose relationship with the United States is strong enough to warrant such a treaty. The regulations will continue to be applied, and the U.S. space industry must adopt a different approach if it is to conduct business with nations other than those with which we have a "special relationship."

³⁶ Zelnio, "Short history of export control policy."

³⁷ William Matthews, "Proposed Treaty Would Ease Defense Exports to U.K." *Space News*, July 31, 2007, http://www.space.com/spacenews/archive07/congress_0723.html (accessed May 1, 2008).

Appendix C – Space Foundation Survey Methodology

The Space Foundation conducted its ITAR survey, facilitated by The Everett Group, LLC, from late May through September 2007, gathering inputs from invited space industry members through a Web-based online questionnaire, custom-designed and hosted at www.itarsurvey.org (the domain's registration was allowed to lapse after the completion of the survey fieldwork). The initial survey invitations went to the Space Foundation's Corporate Members and to members of the Space Supplier Council. The Space Foundation prepared and issued a press release announcing the survey and invited participants to log onto the survey site. Additional invitations containing the survey URL were posted on various industry listservs and message boards. We gathered usable responses from 24 different organizational representatives (including 16 Space Foundation Corporate Members). Because the survey invitees were not selected randomly from the population of U.S. space industry members, the quantitative results cannot be generalized to that population and inferential statistical tests are unsupported. The survey results should be interpreted as intuitive, non-statistical evidence.

If you have questions about the study or the survey methodology, please contact research@spacefoundation.org.

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