

AN OVERREACTION THAT DESTROYED AN INDUSTRY: THE PAST, PRESENT, AND FUTURE OF U.S. SATELLITE EXPORT CONTROLS

KURTIS J. ZINGER*

In the past, the United States' satellite export control regime has acted as a barrier to entry for the commercial space industry and has stifled the growth of space startups that are beginning to become more common as access to space becomes more affordable. Within the span of two decades, agency responsibility for satellite exports has changed hands multiple times for economic, political, and national security reasons. In 2013, Congress passed a bill authorizing the President of the United States to determine which regulations govern satellite exports. President Obama, the State Department, and the Commerce Department are taking full advantage of this congressionally granted leeway and are proposing rules that could have a significantly positive impact on the American commercial satellite industry, especially on fledgling space startups. In light of the potential positive benefits of America's updated satellite export control regime, this Comment assesses the implications of this legislative update, the potential for positive economic impacts on the American satellite industry, and what the update could mean for entrepreneurs who are beginning to look toward the stars for their next venture.

INTRODUCTION	352
I. A HISTORY OF UNITED STATES SATELLITE EXPORT CONTROLS	356
A. <i>A Jurisdictional Split</i>	357
B. <i>Export Control Prior to 1996</i>	360

* J.D. Candidate, 2015, University of Colorado Law School; Managing Editor, *University of Colorado Law Review*. I must first thank Karl Hoffman, who was instrumental in preparing this Comment for publication. I also thank Andrew Gomez, Gabe Bouvet, Amy Moore, Cassady Adams, Vanya Akrahoff, Casey Strong, Shannon Kerr, and Kathleen Snow for their input and help throughout the editing process. Last but not least, I would like to thank my mother, father, and Beth, without whom I would be lost in space.

352	UNIVERSITY OF COLORADO LAW REVIEW	[Vol. 86]
	<i>C. The Hughes and Loral Satellite Incidents</i>	361
	1. Hughes & Apstar 2.....	362
	2. Loral & Intelsat 708.....	364
	3. The Impact.....	366
	<i>D. The 2013 NDAA</i>	368
	<i>E. The Changing Face of Munitions List Category</i>	
	XV.....	371
II.	THE NEW EXPORT CONTROL REGIME.....	373
	<i>A. Positive Effects</i>	373
	1. The Economics of It All.....	373
	2. Treating Satellites Differently on the Basis of	
	Function.....	376
	3. Building on the New Foundation.....	379
	<i>B. Potential Risks</i>	380
	1. National Security: Hughes and Loral	
	Revisited.....	380
	2. Is the Commerce Department Ready and	
	Able?.....	383
	<i>C. New Technologies, New Problems</i>	385
	CONCLUSION.....	387

INTRODUCTION

In April 1998, news agencies began reporting that “American national security ha[d] been severely damaged” after multiple American-made satellites—riding atop Chinese rockets—exploded over Asia before ever reaching space; unfortunately, the satellites’ manufacturers had transferred sensitive technical data that had the potential to improve communist China’s missile technology.¹ In response, Congress created a committee to investigate specific instances of satellite-related technology transfer to China and whether America’s national security was at risk as a result of the transfers.² Representative Christopher Cox of California, in debating the investigative scope and authority of the

1. 144 CONG. REC. 12,868 (1998) (statement of Rep. Gerald Solomon); Jeff Gerth & Raymond Bonner, *Companies are Investigated for Aid to China Rockets*, N.Y. TIMES, Apr. 4, 1998, <http://www.nytimes.com/1998/04/04/world/companies-are-investigated-for-aid-to-china-on-rockets.html>, archived at <http://perma.cc/8G3V-QXZP>.

2. 144 CONG. REC. 12,868 (1998) (statement of Rep. Gerald Solomon).

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 353

committee, outlined his concerns with the United States' satellite export control regime and the potential effects of its failures:

All of these media reports give rise to a number of unanswered questions that will be the object of the Select Committee's focus. There is no more important question before the Select Committee than the one with which we will begin. "Has the reliability or accuracy of nuclear missiles in the arsenal of [China] been enhanced; and, if so, how did this happen?"³

American companies had provided sensitive technological data that had the potential to assist China in improving the efficacy of its rockets—the same rockets that carry nuclear warheads. The story could have sprung from the pen of Tom Clancy or Alistair MacLean. Yet this "story" was real.

The unauthorized transfer of technical information to China as a result of satellite exports in the 1990s had lasting, negative effects on the United States satellite industry that took years to document. Almost two decades later, Congress has finally taken the first step toward repairing legislation that stifled innovation and effectively destroyed a burgeoning industry.

In 1995 and 1996, two satellites built by American manufacturers Hughes Space and Communications International, Inc. (Hughes) and Space Systems/Loral (Loral) exploded shortly after their launch.⁴ Both Hughes and Loral had contracted with a People's Republic of China ("PRC" or "China") government entity to launch the satellites using China's Long March 2E rockets.⁵ This international arrangement, while not uncommon, required an export license to comply with the United States' complex system of export control regulations.⁶ In an attempt to monitor sensitive

3. *Id.* at 12,901 (statement of Rep. Christopher Cox).

4. Elizabeth S. Waldrop, *Integration of Military and Civilian Space Assets: Legal and National Security Implications*, 55 A.F. L. REV. 157, 193 (2004).

5. See REPORT OF THE SELECT COMMITTEE ON U.S. NATIONAL SECURITY AND MILITARY/COMMERCIAL CONCERNS WITH THE PEOPLE'S REPUBLIC OF CHINA, H.R. REP. NO. 105-851, ch. 5, at 2 (1999), available at <http://www.gpo.gov/fdsys/pkg/GPO-CRPT-105hrpt851/pdf/GPO-CRPT-105hrpt851.pdf>, archived at <http://perma.cc/QR9A-4JX7> [hereinafter COX REPORT].

6. Waldrop, *supra* note 4, at 193.

technology and hardware transfers between the United States and foreign nations, the United States' export control regime requires that certain types of exports—in this case, satellites—receive a license from a United States governmental agency.⁷ Hughes and Loral applied for and received an export license for the Chinese launch, but what happened next would have substantial consequences for the United States' export control regime.

In the wake of the satellite explosions, Hughes and Loral assisted Chinese authorities in investigating the cause of the accidents, transferring potentially sensitive technological information regarding rocketry to China's government in the process.⁸ Because both companies failed to obtain a proper export license from the United States government to conduct certain aspects of the accident investigation—a license separate and distinct from the companies' launch license—the Justice Department launched an investigation to determine whether there had been an export control violation.⁹ Ultimately, the House of Representatives, led by Representative Cox, formed a committee to investigate Hughes's and Loral's actions, and that committee concluded that unauthorized transfers of technology had indeed occurred.¹⁰ In response to the congressional committee's findings, Congress passed the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 (Strom Thurmond Act), which transferred export control responsibility for all commercial and non-commercial satellites from the Commerce Department's Export Administration Regulations (EAR) to the more restrictive International Traffic in Arms Regulations (ITAR) of the State Department.¹¹

7. *Id.*

8. See COX REPORT, *supra* note 5, at 2–5.

9. Waldrop, *supra* note 4, at 193–94.

10. *Id.*

11. See Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, Pub. L. No. 105-261, § 1513, 112 Stat. 1920 (1998) [hereinafter Strom Thurmond Act] (“[A]ll satellites and related items that are on the Commerce Control List of dual-use items in the Export Administration Regulations . . . on the date of the enactment of this Act shall be transferred to the United States Munitions List and controlled under section 38 of the Arms Export Control Act.”); Amendment to the International Traffic in Arms Regulations: Revision of U.S. Munitions List Category XV and Definition of “Defense Service”, 78 Fed. Reg. 31,444, (proposed May 24, 2013) (to be codified at 22 C.F.R. pts. 120, 121, 124) [hereinafter Proposed Rule I].

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 355

Fast-forward almost fifteen years. On January 2, 2013, President Barack Obama signed into law the National Defense Authorization Act for Fiscal Year 2013 (2013 NDAA).¹² The 2013 NDAA contained, among a great deal of controversial material, a provision that “effectively returned to the president the authority to determine which regulations govern the export of satellites and related articles.”¹³ With little fanfare, Congress ended the restrictions on satellite exports it put in place in 1999 in the aftermath of the Hughes and Loral incidents. Within the span of fifteen years, Congress had done a legislative one-eighty. Congress went from entrusting the protective State Department with all export control responsibility to giving the president the power to transfer export control to the less stringent Commerce Department.

This Comment examines the reasons behind Congress’s change of heart, as well as the real and potential effects of the change. In short, the effects of the change have been swift and have the potential to significantly impact the American commercial satellite industry. Both the State and Commerce Departments issued proposed rules mere months after the passage of the 2013 NDAA.¹⁴ This Comment argues that this regulatory movement is evidence of the American satellite industry’s thirst for less restrictive means to send American technology into space and that this congressional change of heart is just what the American satellite industry needs to regain the competitiveness the industry lost in the 1990s due to

12. National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239, § 1261, 126 Stat. 1632 (2012) (codified at 22 U.S.C. § 2778 (2012)) [hereinafter 2013 NDAA]; see also Charlie Savage, *Obama Disputes Limits on Detainee Transfers Imposed in Defense Bill*, N.Y. TIMES, Jan. 3, 2013, http://www.nytimes.com/2013/01/04/us/politics/obama-signs-defense-bill-with-conditions.html?_r=0, archived at <http://perma.cc/KTR5-JFWB>.

13. Proposed Rule I, *supra* note 11, at 31,444.

14. See *id.*; Export Administration Regulations (EAR): Control of Spacecraft Systems and Related Items the President Determines No Longer Warrant Control Under the United States Munitions List (USML), 78 Fed. Reg. 31,431 (proposed May 24, 2013) (to be codified at 15 C.F.R. pts. 732, 734, 736, 740, 742, 744, 748, 758, 772, 744) [hereinafter Proposed Rule II]; Amendment to the International Traffic in Arms Regulations: Revision of U.S. Munitions List Category XVI, 78 Fed. Reg. 6269 (proposed Jan. 30, 2013) (to be codified at 22 C.F.R. pts. 121, 123, 124, 125, 129); Amendment to the International Traffic in Arms Regulations: Revision of U.S. Munitions List Category IV, 78 Fed. Reg. 6795 (proposed Jan. 31, 2013) (to be codified at 22 C.F.R. pts. 120, 121, 123); Amendment to the International Traffic in Arms Regulations: Revision of U.S. Munitions List Category XI, 78 Fed. Reg. 45,018 (proposed July 25, 2013) (to be codified at 22 C.F.R. pt. 121).

restrictive export control regulation.¹⁵ This Comment also argues that, with the 2013 NDAA, Congress effectively acknowledged that it had overreacted by wrongfully scapegoating the United States satellite industry in an attempt to place blame elsewhere, when the government's own actions were truly at fault.

Part I discusses the circumstances under which the restrictive export control regime of the 1990s developed. Part II then argues that while concern is certainly justified, the economic impact of the new satellite export control regime will be overwhelmingly positive for America's satellite industry, posing minimal risk to America's national security interests. Part II also discusses whether the new export control regime goes far enough in addressing the concerns of commercial space entrepreneurs. Finally, this Comment concludes by arguing that Congress, by passing the 2013 NDAA, has come to terms with its legislative overreaction in the late 1990s and, as a result, the future of the American satellite industry is bright.

I. A HISTORY OF UNITED STATES SATELLITE EXPORT CONTROLS

To appreciate the gravity of the most recent change to the United States' satellite export control regime, it is helpful to look at the checkered regulatory past of space hardware and technology export controls by examining the regulation of communications satellites (comsats) over time. The focus on comsats is appropriate for various reasons, not the least of which is the size of the commercial satellite market and the well-documented impact export control regulations have on the market.¹⁶ Additionally, comsats have traditionally been classified as dual-use; that is, comsats have potential military applications, but they also have recognized civilian applications.¹⁷ Perhaps because of this dual-use classification,

15. Benjamin Sutherland, *Why the U.S. Space Industry Lags Behind Europe's*, NEWSWEEK (Jan. 30, 2009, 7:00 PM), <http://www.newsweek.com/why-us-space-industry-lags-behind-europes-77797>, archived at <http://perma.cc/3CT3-CXUF> ("The impact [of stringent American satellite export controls] is most keenly felt in the \$123 billion commercial-satellite business, which has been growing at more than 10 percent a year for more than a decade.").

16. See *id.*

17. Karri Allen, Comment, *Communications Satellites and U.S. Export Controls: Correcting the Balance*, 18 COMMLAW CONSPECTUS 463, 471 (2010).

governance of comsat export controls has drifted back and forth between two different regulatory bodies: the State Department and the Commerce Department. First, this Part discusses the differences between the State Department's and Commerce Department's approach to export controls, while the remaining sections address the critical points in history when satellite export licensing jurisdiction has been partially or completely transferred to one department or the other. This Part ends by taking a retrospective look at the changing face of the regulations that ultimately dictate the stringency of satellite export controls.

A. *A Jurisdictional Split*

The responsibility for the licensing of comsat exports has historically vacillated between the State Department and the Commerce Department.¹⁸ The State Department (through ITAR) and the Commerce Department (through EAR) regulate exports of sensitive space hardware and technology.¹⁹ ITAR governs all items that fall under a plethora of categories listed on the United States Munitions List (Munitions List), while EAR governs any items that fall under the Commerce Control List (CCL).²⁰ Thus, satellite manufacturers have not had the benefit of a single regulator; rather, jurisdiction over satellite export control has been anything but certain in the relatively brief period of time in which commercial satellite companies have sought access to space.

Justifications for these transfers of power and responsibility range from congressional interests in protecting sensitive technology to presidential interests in promoting an American satellite industry that has become the victim of extensive governmental red tape.²¹ Legal commentators and

18. Matthew D. Burris, *Tilting at Windmills? The Counterposing Policy Interests Driving the U.S. Commercial Satellite Export Control Reform Debate*, 66 A.F.L. REV. 255, 260–62 (2010).

19. DEPT'S OF DEF. & STATE, RISK ASSESSMENT OF UNITED STATES SPACE EXPORT POLICY i (2012), *available at* http://www.defense.gov/home/features/2011/0111_nsss/docs/1248_Report_Space_Export_Control.pdf, *archived at* <http://perma.cc/W68T-GWS7> [hereinafter 2012 RISK ASSESSMENT].

20. *Id.*

21. *See, e.g.*, 144 CONG. REC. 12,868 (1998) (statement of Rep. Gerald Solomon) (describing national security implications of Hughes and Loral incidents); *see also* 144 CONG. REC. 12,897 (1998) (statement of Rep. Joel Hefley) ("Under President Clinton, the licensing authority has been taken away from the

industry experts agree: the Commerce Department's EAR regime is much more business friendly and conducive to economic growth and competitiveness than the State Department's ITAR regime.²² The question is: why?

First, the departments have inherently different goals and incentives. The Commerce Department's mission is to promote "job creation, economic growth, sustainable development and improved standards of living for all Americans,"²³ while the State Department's goals are more national-security oriented.²⁴ Commercial benefits flow primarily from the former, not the latter.

More importantly, though, are the structural differences in the departments' regulatory regimes: the EAR and the ITAR. For example:

Proposals to reform the ITAR, such as imposing limits to licensing times and streamlined processes, are already covered in the EAR and management of the Commerce Department. The exceptions to licensing requirements available from the agency are much broader and easier to use in application than the license exemptions available from the State Department because the Commerce Department exceptions are listed in one place.²⁵

Even the State Department recognizes the difference between ITAR and EAR: "The EAR provides for flexible controls that can be applied or removed as technology becomes readily available on the global market and transitions away from predominantly military uses to commercial purposes."²⁶

State Department and given to the Department of Commerce. The Commerce Department's goal is to promote business, not to protect national security. Additionally, the veto power of the Department of Defense has been removed. Clearly, economic and commercial benefits have become the most important factor in this administration's licensing determinations.").

22. See, e.g., Waldrop, *supra* note 4, at 194; Jason A. Crook, *National Insecurity: ITAR and the Technological Impairment of U.S. National Space Policy*, 74 J. AIR L. & COM. 505, 511–12 (2009).

23. *About Commerce*, DEP'T OF COMMERCE, <http://www.commerce.gov/about-department-commerce> (last visited Mar. 16, 2014), *archived at* <http://perma.cc/SPE7-2X99>.

24. 144 CONG. REC. 12,897 (1998) (statement of Rep. Joel Hefley).

25. Allen, *supra* note 17, at 484. For a helpful graphic comparing and contrasting the State Department and Commerce Department's export control regimes, see *id.* at 485.

26. 2012 RISK ASSESSMENT, *supra* note 19, at 2–3.

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 359

Anecdotal evidence of the commercial space industry's frustration with ITAR is also informative. In a 2007 study, the Defense Department sent surveys to 274 space industry companies and business units asking questions related to export licensing and the current regime's impact on the economics of their industry.²⁷ Almost half of the surveyed companies had not applied for export licenses "due to the real or perceived problems with navigating the licensing process."²⁸ The survey also revealed that some "companies have changed or plan to change their business models to cope with ITAR and have considered or are currently considering a change to focus on domestic customers only."²⁹

The licensing regime under ITAR had extreme consequences. Indeed, "the reported loss of foreign sales due to ITAR was \$2.35 billion, mainly due to lengthy processing times."³⁰ Furthermore, the applicability of ITAR to space companies produced some absurd results. For example, when a spacecraft stand indistinguishable from a common coffee table and manufactured by the American company Bigelow Aerospace fell under ITAR control, Bigelow's attorney sarcastically opined, "[o]ne can only imagine the repercussions of Russian agents gaining access to the [spacecraft stand]. Its secrets could have easily been sold to Iran or North Korea, where America's enemies could someday use such technology to serve sandwiches or even tea on."³¹ Foreign companies have even created ITAR-free space hardware with no ITAR-regulated components to bypass the stringent United States export controls.³²

27. DEPT OF DEF., DEFENSE INDUSTRIAL BASE ASSESSMENT: U.S. SPACE INDUSTRY FINAL REPORT ix (2007), available at https://www.bis.doc.gov/index.php/forms-documents/doc_view/38-defense-industrial-base-assessment-of-the-u-s-space-industry-2007, archived at <http://perma.cc/3VHZ-6K75> [hereinafter BASE ASSESSMENT].

28. *Id.* at 47.

29. *Id.*

30. *Id.* at 42 (Three months was the average processing time for "Technical Assistance Agreement[s] (TAAs) . . . TAAs, granted by the U.S. Department of State, include marketing, proposal meetings/phone calls, international cooperation, and permission to hire foreign nationals.").

31. Mike N. Gold, *Lost In Space: A Practitioner's First-Hand Perspective on Reforming the U.S.'s Obsolete, Arrogant, and Counterproductive Export Control Regime for Space-Related Systems and Technologies*, 34 J. SPACE L. 163, 172–73 (2008); see also Burris, *supra* note 18, at 282–83.

32. Burris, *supra* note 18, at 282–83 ("The ITAR-free movement and the prospect of the new policy realities resulting therefrom have clearly made an

Despite the popular appeal of the EAR—or perhaps more appropriately, despite the shortcomings of ITAR—jurisdiction over satellite export control has continuously vacillated between the State Department and the Commerce Department, between ITAR and EAR, and between the Munitions List and CCL. Understanding the reasons behind these movements helps frame the 2013 NDAA’s important implications and explain why this change in regulatory approach has the potential to reshape the United States’ competitiveness in the commercial satellite industry.

B. Export Control Prior to 1996

Before 1993, “the export of both . . . satellite[s] and any information that might improve [satellite launch vehicles] was] subject to State Department licensing jurisdiction.”³³ State Department restrictions were historically less business-friendly than the regulations’ counterparts at the Commerce Department.³⁴ As the worldwide satellite industry began to boom, the effects of the restrictive State Department export controls became readily apparent through a dwindling American commercial satellite industry.³⁵ Perhaps because of this economic catalyst, licensing jurisdiction over certain commercial satellites shifted to the Commerce Department in 1993.³⁶ However, the transfer of jurisdiction was only partial because “licensing for improvements to any part of the [launch vehicle] rocket . . . remained with the State Department.”³⁷ This split in jurisdiction over satellite export control would soon have serious implications for American satellite

impact politically. Indeed, a senior staffer for the House Committee on Foreign Affairs told a satellite conference in March 2010 that the ITAR-free movement, “has changed the environment . . . significantly.” (quoting Jeff Foust, *Boring But Important Policy Developments*, SPACE REV. (Nov. 2, 2009), <http://www.thespace.com/article/1503/1>, archived at <http://perma.cc/A33H-VCVA>). Interestingly, the most notable company manufacturing ITAR-free satellites recently discontinued the ITAR-free product line after a State Department investigation. See Warren Ferster, *U.S. Satellite Component Maker Fined \$8 Million for ITAR Violations*, SPACE NEWS (Sept. 5, 2013), <http://www.spacenews.com/article/satellite-telecom/37071us-satellite-component-maker-fined-8-million-for-itar-violations>, archived at <http://perma.cc/EG3M-NGE4>.

33. COX REPORT, *supra* note 5, ch. 5, at 3.

34. Allen, *supra* note 17, at 463; see *supra* Part I.A.

35. See *supra* Part I.A.

36. COX REPORT, *supra* note 5, ch. 5, at 44.

37. *Id.* at 3–4.

manufacturers and exporters.

The first major switch in the United States' approach to satellite export control came on March 14, 1996, when President Bill Clinton moved the satellite licensing function from the State Department to the Commerce Department.³⁸ By October 1996, all jurisdiction over comsats had been transferred to the Commerce Department.³⁹ However, this encouraging step forward was short lived.

C. *The Hughes and Loral Satellite Incidents*

Two particular incidents, discussed further below, shaped the development and changes in United States satellite export control policy throughout the late 1990s. In 1995, a comsat manufactured by Hughes, an American company, exploded atop a Chinese rocket before it reached orbit.⁴⁰ In 1996, another Chinese rocket failed mid-flight and destroyed the American-built Loral Intelsat 708 satellite.⁴¹ Following the launch failures, Hughes and Loral each initiated post-launch investigations, which included review and analysis of sensitive technical data.⁴² After the companies transferred investigation findings to China, the United States government found that both companies violated United States export controls.⁴³ The Hughes and Loral launch failures and subsequent transfer of sensitive technological data would ultimately help shape American satellite export control regulations for the following two decades.

38. For an extensive, albeit speculative, discussion and article regarding the reasons behind President Clinton's decision to migrate the satellite licensing function from the State Department to the Commerce Department, see 144 CONG. REC. 12,880–86 (1998) (statement of Rep. Gerald Solomon); Jeff Gerth, *Democrat Fund-Raiser Said to Detail China Tie*, N.Y. TIMES, May 15, 1998, at A20, available at <http://www.nytimes.com/1998/05/15/us/democrat-fund-raiser-said-to-detail-china-tie.html>, archived at <http://perma.cc/D5UW-5QSQ>.

39. Ryan Zelnio, *A Short History of Export Control Policy*, SPACE REV. (Jan. 9, 2006), <http://www.thespacereview.com/article/528/1>, archived at <http://perma.cc/B2VB-6MZS>.

40. COX REPORT, *supra* note 5, ch. 5, at 40.

41. *Id.* ch. 6, at 100.

42. *Id.* ch. 5, at 42; *id.* ch. 6, at 107–08.

43. *Id.* ch. 5, at 68–69; *id.* ch. 6, at 164.

1. Hughes & Apstar 2

Before Hughes placed a comsat atop Chinese rockets, it first had to procure an export license for the launch.⁴⁴ Two years before the 1995 launch, Hughes submitted an application to the Commerce Department—the agency in charge of export licensing at that time—seeking export authorization for one of its comsats, the Apstar 2.⁴⁵ A few months later, the Commerce Department issued a license to Hughes permitting the temporary export of Apstar 2 to China exclusively for launch.⁴⁶ However, the “license restricted the export of detailed design, engineering, or manufacturing data . . . [and] required a State Department license for activities and technical data covered by the State Department Munitions List.”⁴⁷

In 1995, Apstar 2 launched as the primary payload on a Chinese Long March 2E rocket, which exploded fifty seconds after liftoff.⁴⁸ Following the failed attempt to insert Apstar 2 into orbit, Hughes’s Vice President, Donald Cromer, appointed a Failure Investigation Team to investigate all aspects of the failed launch.⁴⁹ Hughes officials considered obtaining a State Department license early on in their investigation, going so far as to notify the Commerce Department in writing of the launch failure and “stating that future discussions with China might require a State Department license and that Hughes would submit a State Department license, if necessary.”⁵⁰ Hughes’s attorneys researched what transfers of technical data to Chinese authorities would necessitate a State Department license and concluded that, “with the exception of limited satellite and telemetry data, all other PRC requested data would require a State Department license.”⁵¹

At the time of the Apstar 2 explosion, the regulatory scheme for comsats was particularly muddled: “Despite the shift to Commerce Department in 1993 of licensing jurisdiction for certain commercial satellites, the State Department still was solely responsible in 1995 for the licensing of any technical

44. Waldrop, *supra* note 4, at 193.

45. COX REPORT, *supra* note 5, ch. 5, at 40.

46. *Id.*

47. *Id.*

48. *Id.*

49. *Id.* at 42.

50. *Id.* at 43–44.

51. *Id.* at 44.

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 363

data that could improve PRC rockets.”⁵² This jurisdictional mess forced Hughes representatives to meet with the Commerce Department in 1995 to discuss what, if any, State Department licensing the Failure Investigation Team needed to obtain to discuss their findings with Chinese authorities.⁵³ The consensus at the end of the meeting was that any information that could lead to improvements of China’s Long March 2E rockets would require a State Department license, distinct from Hughes’s initial Commerce Department license for the satellite’s launch.⁵⁴

After investigation into the Apstar 2 incident, Hughes determined that a structurally deficient rocket fairing, the demise of which was exacerbated by excessive vibration, was the root cause of the explosion.⁵⁵ Coincidentally, this was the same conclusion Hughes had come to after an analysis of a 1993 failure of a similar Long March 2E rocket, which the United States government also investigated for a potential violation of American export controls.⁵⁶ China, though, did not agree with Hughes on the ultimate cause of the launch failure and was convinced that the interface between the satellite and the rocket was truly at fault.⁵⁷ Despite this disagreement, both parties agreed on a solution that would improve the rocket’s fairings as well as the satellite interface.⁵⁸

Presumably in an attempt to help China improve its Long March 2E rockets, Hughes transferred materials to China that included a final failure investigation report.⁵⁹ Prior to sending the documents to the Chinese, however, Hughes sought approval from and provided copies of the documents to the Commerce Department’s export licensing department.⁶⁰ The Commerce Department authorized the transfer of all the documents in late 1995.⁶¹ As an early sign of the regulatory regime’s jurisdictional flaws, some of the transferred materials included information that the Commerce Department had

52. *Id.* at 40.

53. *Id.* at 46.

54. *Id.*

55. *Id.* at 59.

56. *Id.* at 50–51, 65.

57. *Id.* at 65.

58. *Id.*

59. *Id.* at 60, 62.

60. *Id.* at 60.

61. *Id.* at 62.

deemed appropriate under Hughes's Commerce Department export license, but would later be held by the State Department to require a State Department license.⁶²

After the completion of a government investigation stemming from worries that sensitive data had been transferred to China, the Defense Department found that "the conclusions outlined in the Hughes/Apstar materials provided to the PRC . . . were sufficiently specific to inform the PRC of the kinds of launch vehicle design or operational changes that would make the Long March 2E (and perhaps other launch vehicles as well) more reliable"⁶³ The Defense Department concluded that the information Hughes provided to China could have had particularly helpful military applications; namely, the information could have improved the efficacy of China's ballistic missiles.⁶⁴ In 1999, the Justice Department conducted a criminal investigation of Hughes's export control violations, but decided against filing charges.⁶⁵

The Hughes comsat incident ended in 2003 when Hughes and the State Department announced a \$32 million settlement.⁶⁶ In a written statement memorializing the settlement agreement, the chief executive of Hughes acknowledged "the 'nature and seriousness of the offenses charged by the Department of State, including the harm such offenses could cause to the security and foreign policy interests of the United States.'"⁶⁷

2. Loral & Intelsat 708

Loral, another American company, contracted with China to launch a comsat it had manufactured for Intelsat, the world's largest commercial satellite services provider.⁶⁸ Rather than obtaining Commerce Department licenses for the launch, however, Loral applied for and received two licenses from the State Department in 1992 and 1993 that permitted the launch

62. *Id.* at 63–64.

63. *Id.* at 68–69.

64. *Id.*

65. Andy Pasztor, *Boeing, Hughes Settle Case Over Satellite Technology*, WALL ST. J. (Mar. 5, 2003, 4:36 PM), <http://online.wsj.com/news/articles/SB1046893957378720160>, archived at <http://perma.cc/RR4X-GDH5>.

66. *Id.*

67. *Id.* (quoting Hughes Chief Executive Jack Shaw)

68. COX REPORT, *supra* note 5, ch. 6, at 100.

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 365

of the Intelsat satellite in China.⁶⁹ The Long March 3B rocket carrying the Loral satellite tipped over before clearing the launch tower and flew parallel to the ground for twenty-two seconds before crashing into a hillside, destroying the rocket and satellite in the process.⁷⁰ Shortly after the incident, Chinese-controlled launch authorities created two separate investigative groups to analyze the crash and pinpoint a cause for the rocket's failure.⁷¹ The results of the Chinese investigation led China to conclude that "a failure in the inertial measurement unit within the control system of the rocket" caused the Long March 3B rocket to fail.⁷² Despite these initial results, an American insurance brokerage firm required an independent review of the Chinese investigation before the space insurance industry would insure future launches from China.⁷³

China invited Loral to sit on the Independent Review Committee (Review Committee) that would review the Chinese investigation; Loral in turn invited experts from Loral, Hughes, and other American aerospace companies to join the committee as well.⁷⁴ The Review Committee met in California and China and drafted a preliminary report detailing its findings, which Loral provided to China in May 1996.⁷⁵ Following a news report from a widely read industry publication detailing Loral's interactions with China via the Review Committee, the State Department and Defense Department began investigating the documents the committee ultimately transferred to China.⁷⁶ Importantly, after receiving the Review Committee's report, China "discarded its original [launch failure] analysis" and changed its findings to match those of the Review Committee, signaling that the Review Committee had assisted China in correctly identifying issues with Chinese rocket technology.⁷⁷ Following the government's investigation into potential export control violations, the Defense Technology Security Administration stated in a 1997 assessment of the Review

69. *Id.* at 109.

70. *Id.* at 100.

71. *Id.* at 107.

72. *Id.*

73. *Id.* at 107–08.

74. *Id.* at 108–09.

75. *Id.* at 109–10.

76. *Id.* at 113.

77. *Id.* at 114.

Committee's activities that "[t]he significant benefit derived by China from these activities [is] likely to lead to improvements in the overall reliability of their launch vehicles . . . and ballistic missiles and in particular their guidance systems."⁷⁸

In 2002, Loral agreed to pay a \$14 million fine to the State Department in addition to spending \$6 million "to improve its compliance procedures over seven years."⁷⁹ The settlement, which included the largest payment by an American company under the Arms Export Control Act in history until Hughes's settlement in 2003, relieved Loral from a federal inquiry into whether it had violated export control regulations without requiring an admission of guilt.⁸⁰ Federal authorities had "charged the company with 64 counts of violating rules governing the transfer of sensitive technologies."⁸¹ Although the Loral settlement occurred prior to Hughes's, the settlement agreements contained stunningly similar language signaling how serious the export control violation had been. For instance, in announcing the settlement, "Loral executives 'acknowledge[d] the nature and seriousness of the offenses alleged by the department in the draft charging letter, including the risk of harm to the security and foreign policy interests of the United States'"⁸²

3. The Impact

The Hughes and Loral incidents resulted in millions of dollars in fines and changed the landscape of American satellite export control regulations. The media attention and national security implications surrounding the incidents culminated in congressional action largely because of an influential document referred to as the Cox Report.⁸³

78. *Id.* at 164 (quoting the Defense Technology Security Administration's 1997 assessment of the Independent Review Committee activities).

79. Christopher Marquis, *Satellite Maker Fined \$20 Million in China Trade Secrets Case*, N.Y. TIMES (Jan. 10, 2002), <http://www.nytimes.com/2002/01/10/world/satellite-maker-fined-20-million-in-china-trade-secrets-case.html>, archived at <http://perma.cc/JG8L-4R26>.

80. *Id.*

81. *Id.*

82. *Id.* (quoting Loral's agreement with the State Department).

83. 144 CONG. REC. 12,881 (1998) (statement of Rep. Gerald Solomon) ("Beginning in April of this year, Mr. Speaker, the *New York Times* has focused on the somewhat sordid history of the transfer of American satellite technology to Communist China. These press accounts have asserted, Mr. Speaker, that

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 367

On June 18, 1998, the House of Representatives overwhelmingly passed a measure creating the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China (Cox Committee).⁸⁴ As Congress passed the resolution creating the Cox Committee, members chimed in with their support and concerns, most of which were aimed at getting to the bottom of the Hughes and Loral incidents:

The resolution before the House will establish a select committee to answer, among other things, did the transfer of technology contribute to the enhancement of the accuracy of nuclear armed intercontinental ballistic missiles of the People's Republic of China, missiles that right this minute are aimed at the United States of America?⁸⁵

The House record was filled with *New York Times* articles detailing the Hughes and Loral incidents, relationships between President Clinton and Hughes executives, and the potential threat to national security posed by satellite companies' transfer of sensitive technical data to China.⁸⁶ The motivations behind the Cox Committee were undoubtedly political to a certain extent: President Clinton had transferred

American national security has been severely damaged, and campaign contributions may have been a factor in the decisions made."); *see also id.* at 12,901 (statement of Rep. Christopher Cox) ("All of these media reports give rise to a number of unanswered questions that will be the object of the Select Committee's focus. There is no more important question before the Select Committee than the one with which we will begin. 'Has the reliability or accuracy of nuclear missiles in the arsenal of the People's Liberation Army been enhanced; and, if so, how did this happen?"); Waldrop, *supra* note 4, at 194–95 ("The Cox Report sparked other changes to export control legislation, as well. For example, [Department of Defense] now must monitor every single contact between foreign launch services and U.S. satellite manufacturers. The intelligence community also plays a larger role in export decisions. Also, Congress must be notified about ongoing investigations.").

84. 144 CONG. REC. 12,901 (409 yeas and 10 nays).

85. *Id.* at 12,881.

86. *See id.* at 12,881–89; Jeff Gerth, *U.S. Business Role in Policy on China is Under Question*, N.Y. TIMES (Apr. 13, 1998), <http://www.nytimes.com/1998/04/13/world/us-business-role-in-policy-on-china-is-under-question.html>, archived at <http://perma.cc/5ZHY-MFL7> ("The Administration's China policy has come under intense scrutiny in the last year. Congressional investigators have been examining whether China sought to influence policy through illegal campaign contributions to Democratic candidates in 1996. The connection, first suggested in intelligence reports and echoed by Senator Fred Thompson, the Tennessee Republican who led hearings on campaign finance, was never proved.").

licensing jurisdiction to the Commerce Department during the time of the Hughes and Loral incidents and there was evidence that he had received significant campaign contributions from Hughes executives.⁸⁷ Politics aside, Congress agreed to establish the Cox Committee, albeit with limited jurisdiction to focus on the transfer of technology to China, and not so broad a scope as to include unilateral subpoena and deposition powers.⁸⁸

The Cox Committee delivered the Cox Report to Congress in January 1999.⁸⁹ The “Cox Report roundly criticized the export control record of the Clinton Administration with respect to China, and set forth thirty-eight recommendations for changes to that policy.”⁹⁰ The report’s effect was immediate. Export controls became more stringent, and the intelligence community began to play a larger role in export decisions.⁹¹ The Cox Report ultimately “shaped the debate on the law and policy of export controls”⁹² in 1999 and would have a lasting impact on the United States’ approach to export control for years to come.

D. *The 2013 NDAA*

In May 2012, Representatives Adam Smith, Buck McKeon,

87. 144 CONG. REC. 12,881, 12,884–85 (1998) (statement of Rep. Gerald Solomon).

88. *Id.* at 12,894 (statements of Rep. Jonas “Martin” Frost III) (“Finally, Mr. Speaker, my Committee on Rules Democratic colleagues and I are particularly concerned about the breadth and scope of this investigation. This resolution rightfully empowers the Select Committee with the authority to make a full and complete inquiry into not just technology transfers which may have contributed to the enhancement of the offensive capabilities of the People’s Republic of China and its effect on the national security concerns of the United States, but other issues relating to export policies and the influence of campaign contributions. These are legitimate areas of investigation, but I am concerned that the authorities granted in this resolution are so broad that the Select Committee could go on working well into the future.”).

89. COX REPORT, *supra* note 5, Overview, at ii.

90. Christopher F. Corr, *The Wall Still Stands! Complying with Export Controls on Technology Transfers in the Post-Cold War, Post-9/11 Era*, 25 HOUS. J. INT’L L. 441, 505 (2003).

91. Waldrop, *supra* note 4, at 194–95 (“The Cox Report sparked other changes to export control legislation, as well. For example, [Department of Defense] now must monitor every single contact between foreign launch services and U.S. satellite manufacturers. The intelligence community also plays a larger role in export decisions. Also, Congress must be notified about ongoing investigations.”).

92. William M. McGlone & Michael L. Burton, *Economic Sanctions and Export Controls*, 34 INT’L LAW. 383, 398 (2000).

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 369

Dana Rohrabacher, and Kevin McCarthy put forth an amendment (Smith Amendment) to the 2013 NDAA that “[w]ould remove commercial satellites and related components from the United States [M]unitions [L]ist.”⁹³ The bipartisan amendment returned to the president the power to transfer satellite export control from the State Department and ITAR’s Munitions List to the Commerce Department and EAR’s CCL.⁹⁴ In marking the introduction of the amendment, Representative Don Manzullo noted that “[t]his amendment has been a long time in coming. Congress overreacted back in 1998 to move export licensing decisions for [comsats] . . . to the highly restrictive [M]unitions [L]ist.”⁹⁵ It is important to note that the 2013 NDAA only authorizes the president to determine which export control regime governs the export of commercial satellites. The 2013 NDAA does not provide for immediate removal of commercial satellites from the Munitions List, which must occur through administrative rulemaking procedures.⁹⁶

But given the history of sensitive technology transfer and national security issues discussed above, what made Congress change course between the late 1990s and 2012? One explanation is purely economic. The transfer of satellite export control responsibility back to the State Department may have stemmed from serious national security concerns, but the transfer had a chilling effect on the economic strength of America’s commercial satellite industry. Within ten years of the State Department’s takeover of satellite export control, the United States’ share of the global satellite manufacturing market had fallen almost 25 percent.⁹⁷ At least one foreign company began to manufacture “ITAR-free” satellites to avoid

93. H.R. REP. NO. 112-485, at 43 (2012).

94. 158 CONG. REC. H2792 (daily ed. May 16, 2012) (statement of Rep. Rick Larsen) (“Tomorrow we may be debating an amendment that would grant the administration authority to remove commercial satellites and components from the Munitions List to the Commerce Control List. I would strongly urge my colleagues to support this amendment.”).

95. 158 CONG. REC. H3006 (daily ed. May 17, 2012) (statement of Rep. Donald Manzullo).

96. Proposed Rule I, *supra* note 11, at 31,444.

97. *Export Controls on Satellite Technology: Hearing Before the Subcomm. on Terrorism, Nonproliferation & Trade*, 111th Cong. (2009) (statement of Rep. Gerald Connolly) (“[I]n 1997, U.S. companies controlled 65.1 percent of the world satellite manufacturing market. By 2007 that was down to 41.4 percent.”).

the burdensome regulations.⁹⁸ One supporter of the Smith Amendment, Representative Howard Berman, recognized that “[t]reating commercial satellites and components as if they were lethal weapons, regardless of whether they’re going to friend or foe, has gravely harmed American space manufacturers—a view borne out by numerous studies [and] industry assessments”⁹⁹ In urging fellow congressmen and women to support the Smith Amendment, Representative Berman claimed that the “amendment also supports U.S. national security. It includes a strict prohibition on any satellite exports to China—the original concern that caused Congress to transfer all satellites to the Munitions List—as well as to Iran, North Korea, Syria, Sudan, and Cuba.”¹⁰⁰ In its final form, however, the 2013 NDAA prohibited only satellite transfers to China, North Korea, and “[a]ny country that is a state sponsor of terrorism.”¹⁰¹

Another related catalyst for the Smith Amendment and Congress’s change of heart might have been the Obama Administration’s Export Control Reform Initiative.¹⁰² The initiative, announced by the Obama Administration in late 2010, sought to reform the Munitions List and other export control regulations with “the goal of strengthening national security and the competitiveness of key U.S. manufacturing and technology sectors by focusing on current threats and adapting to the changing economic and technological landscape.”¹⁰³ The Smith Amendment also seemed in line with

98. Peter B. de Selding, *China Launches New Communications Satellite*, SPACE.COM (June 10, 2008, 10:11 AM), <http://www.space.com/5487-china-launches-communications-satellite.html>, archived at <http://perma.cc/T8LZ-852V> (“For Thales Alenia Space, the launch highlighted the fact that the French-Italian firm is alone among the world’s major commercial satellite builders to be able to export satellites to China for launch on the Chinese rockets. The other manufacturers all use U.S.-built components whose export to China is barred by current U.S. technology-export policy.”).

99. 158 CONG. REC. H2997–98 (daily ed. May 17, 2012) (statement of Rep. Howard Berman).

100. *Id.* at H2998.

101. 2013 NDAA, *supra* note 12, § 1261(c)(2)(C).

102. Press Release, The White House, President Obama Lays the Foundation for a New Export Control System to Strengthen National Security and the Competitiveness of Key U.S. Manufacturing and Technology Sectors (Aug. 30, 2010), <http://www.whitehouse.gov/the-press-office/2010/08/30/president-obama-lays-foundation-a-new-export-control-system-strengthen-n>, archived at <http://perma.cc/H9ZC-KSQP>.

103. *Id.*; see also Proposed Rule I, *supra* note 11, at 31,444 (referencing the initiative); Proposed Rule II, *supra* note 14, at 31,431 (referencing the initiative).

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 371

the recommendations of a 2012 risk assessment completed by the State and Commerce Departments at the behest of Congress.¹⁰⁴

The Senate stood alongside the House in supporting the Smith Amendment. Senator Michael Bennet of Colorado spoke about a bill he had put forth earlier in 2012 that sought to reform the United States' satellite export control regime.¹⁰⁵ Before being reassured by the Chairman of the Armed Services Committee that the House version of the 2013 NDAA contained provisions addressing export control reform, Senator Bennet remarked that “[u]nder the current law, satellites must be subject to the most restrictive export controls regardless of whether they are sensitive, militarily significant, or widely available outside of the U.S. This has both diminished our Nation’s economic competitiveness and our national security.”¹⁰⁶

That there was little opposition to the Smith Amendment itself highlights the overwhelming popularity (or, at least, lack of interest) among congressional members. The 2013 NDAA, which included the Smith Amendment as well as controversial material addressing various national security concerns, passed the House with 315 yeas and 107 nays, while the Senate passed the bill with 81 yeas and 14 nays.¹⁰⁷

E. The Changing Face of Munitions List Category XV

Between 1993 and today, the United States' export control regime with regard to satellite hardware and technology has been inconsistent at best. Tracing the history of one particular provision of ITAR's Munitions List offers a glimpse into the cumbersome nature of satellite export controls. From the

104. See 2012 RISK ASSESSMENT, *supra* note 19, at i, 8–9 (defining a list of recommended actions for Congress to take, some of which the Smith Amendment would accomplish).

105. 158 CONG. REC. S7389 (daily ed. Dec. 4, 2012) (statement of Sen. Michael Bennet).

106. *Id.*

107. H.R. 4310 (112th): National Defense Authorization Act for Fiscal Year 2013 (On the Conference Report), GOVTRACK.US, <https://www.govtrack.us/congress/votes/112-2012/h645> (last visited Sept. 18, 2014), *archived at* <http://perma.cc/VYE8-THVB>; H.R. 4310 (112th): National Defense Authorization Act for Fiscal Year 2013 (On the Conference Report), GOVTRACK.US, <https://www.govtrack.us/congress/votes/112-2012/s229> (last visited Aug. 3, 2014), *archived at* <http://perma.cc/6R9T-D8ZB>.

language of Category XV's paragraph (a), the Munitions List category associated with spacecraft systems and related articles, it is easy to see that Congress has yet to settle on a satellite export control regime that satisfies both America's national security and economic concerns. From 1993 until 1996, the Munitions List broadly required licensing for "[s]pacecraft and associated hardware, including ground support equipment, specifically designed or modified for military use."¹⁰⁸ After only minor changes to the space-related Munitions List category between 1996 and 1999,¹⁰⁹ Congress edited the provision in reaction to the Hughes and Loral incidents.¹¹⁰ Language that was narrowly tailored to military application became much broader: "Spacecraft, including communications satellites, remote sensing satellites, scientific satellites, research satellites, navigation satellites, experimental and multi-mission satellites."¹¹¹ Military application was no longer a prerequisite to State Department licensing. Munitions List Category XV(a) changed most dramatically as a result of the 2013 NDAA. Now, subsection (a) contains an exhaustive list of satellite or space-object characteristics, rather than broad categories of equipment, that make a particular item subject to the more extensive ITAR regime.¹¹² For example, satellites that "[h]ave radar remote sensing capabilities or characteristics" or "[p]rovide Positioning, Navigation, and Timing (PNT)" fall under the purview of the Munitions List, but "commercial satellites" as a broad category do not. This move from broad-sweeping categories to characteristics or functionalities of space objects is an important business-minded development and is indicative of the United States' new approach to satellite export control.

108. 22 C.F.R. § 121.1 (1993); *see also* Amendments to the International Traffic in Arms Regulations (ITAR), 58 Fed. Reg. 47,637 (Sept. 10, 1993) (establishing a new Category XV on the Munitions List for spacecraft and related systems).

109. 22 C.F.R. § 121.1 (1996) ("Spacecraft, including satellites, specifically designed or modified for military use."); *see also* Removal of Commercial Communications Satellites and Hot Section Technology From State's USML for Transfer to Commerce's CCL, 61 Fed. Reg. 56,895 (Nov. 5, 1996).

110. *See* Amendments to the International Traffic in Arms Regulations (ITAR): Control of Commercial Communications Satellites on the United States Munitions List, 64 Fed. Reg. 13,679 (Mar. 22, 1999).

111. 22 C.F.R. § 121.1 (1999).

112. Proposed Rule I, *supra* note 11, at 31,449.

II. THE NEW EXPORT CONTROL REGIME

The 2013 NDAA ushers in a new era of satellite export control. It would be easy to characterize the implications of America's most drastic change in export control policy in almost two decades as purely positive given the overwhelming support for the bill in Congress and the commercial satellite industry's concerns with the now-outdated regime. But if Congress saw fit in 1998 to apply the strict ITAR to all satellite exports due to national security concerns, the recent, swift change in policy may give rise to valid concerns. However, these national-security concerns, while valid, should not overshadow the positive impact the 2013 NDAA will have on the commercial satellite industry moving forward. Furthermore, although the 2013 NDAA and associated State Department and Commerce Department rulemakings are positive signs for the commercial satellite industry, the 2013 NDAA did not go far enough. Certain satellite technology will still be constrained by the ITAR or EAR regimes, and Congress and executive agencies should improve upon the new regime's foundation and make exceptions for satellite technology that poses little risk to America's national security. This Part begins by assessing the positive effects of the most recent change to the United States' export control regime, while the second section discusses the potential risks. Part II concludes by discussing the future of export control in the United States as it relates to the commercial satellite industry.

A. *Positive Effects*

The 2013 NDAA authorizes the president to decide which space objects are governed by which export regime. Its likely beneficial effects include: (1) economic gain and increased competitiveness for the United States' commercial satellite industry; (2) decreased red tape for the small businesses and entrepreneurs that are entering the satellite and space industry market at an impressive rate; and (3) a better foundation for future export control changes.

1. The Economics of It All

There is no doubt that economics played the primary role

in bringing about significant satellite export control reform. The change in policy was in part a reaction to a 2012 risk assessment of the United States' export control policy conducted by the Departments of State and Commerce (2012 Report).¹¹³ The 2012 Report was written at the behest of Congress, which required the risk assessment as part of the National Defense Authorization Act for Fiscal Year 2010 (2010 NDAA).¹¹⁴ The 2012 Report is helpful in assessing the potential positive economic effects of reform because it highlighted the many negative economic impacts of the more restrictive ITAR regime.¹¹⁵ In fact, the report was scathing: "Current law forces the U.S. Government to continue to protect commonly available satellites and related items on the [Munitions List], thus impeding the U.S. ability to work with partners and putting U.S. manufacturers at a disadvantage, but providing no noticeable benefit to national security."¹¹⁶

Indeed, there was extensive evidence that pegged restrictive ITAR export controls to the United States' decreasing competitiveness in the commercial satellite industry. During the debates over the passage of the 2013 NDAA, the sponsor of the Smith Amendment spoke to these economic harms:

The cumbersome nature of [our satellite export] regime has significantly harmed the U.S. satellite industry. We've gone from having 65 percent of that market worldwide to less than 25 in the last 15 years. Getting back to a competitive place with that industry is critical to our national security. Those are companies that we're going to depend on to provide us the best equipment to best protect this Nation.¹¹⁷

Another report sponsored by the Defense Department found that "[a]lthough less than 1% of ITAR license applications were denied from 2003–2006, the reported loss of foreign sales due to ITAR was \$2.35 billion, mainly due to lengthy processing

113. 2012 RISK ASSESSMENT, *supra* note 19, at i.

114. National Defense Authorization Act for Fiscal Year 2010, Pub. L. No. 111-84, § 1248, 123 Stat. 2190 (2009) [hereinafter 2010 NDAA].

115. 2012 RISK ASSESSMENT, *supra* note 19, at ii.

116. *Id.*

117. 158 CONG. REC. H7384 (daily ed. Dec. 20, 2012) (statement of Rep. Adam Smith).

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 375

times.”¹¹⁸ This fact indicates that the national security benefits may not be worth the economic costs, especially in an increasingly global market for military equipment and technology.

America’s loss has certainly been the world’s gain. The biggest beneficiaries of the United States’ convoluted satellite export control regime have been European firms, “which have now mastered the gamut of satellite technology, from component manufacturing to assembly, launch and in-orbit management.”¹¹⁹ ITAR is responsible for a change in European firms’ attitudes toward American space hardware technology because, “[w]hen building, launching or operating satellites and other spacecraft, many [European firms] have come to believe [that] American know-how is now a liability.”¹²⁰ This sentiment is reflected in market statistics: “In 1998, the year before ITAR took effect, U.S. firms accounted for 73 percent of the world [commercial satellite] market. Two years later U.S. market share had plunged to 27 percent. During the same period, Europe’s share rose from about a quarter to more than half.”¹²¹

While national security is often cited to justify the restrictive ITAR regime, the State and Commerce Departments agree that:

Applying more stringent export control policies and practices than are imposed by other advanced satellite-exporting countries places the U.S. satellite industry at a distinct, competitive disadvantage that undermines the U.S. space industrial base to the detriment of U.S. national security, while doing nothing to protect the technological advances that are critical to giving our war fighters the advantages that U.S. technology can afford them.¹²²

Thus, improving the economic position of the United States’ space industry worldwide seems to have an interesting, and perhaps counter-intuitive, side effect: improving national security. Furthermore, it is unclear if the stringent satellite

118. BASE ASSESSMENT, *supra* note 27, at x (stating that the average processing time for an ITAR application was three months).

119. Sutherland, *supra* note 15.

120. *Id.*

121. *Id.*

122. 2012 RISK ASSESSMENT, *supra* note 19, at 1.

export controls enshrined in ITAR even resulted in their purported national security benefits.¹²³

Although the quick and full recovery of the United States' commercial satellite industry is anything but certain, industry participants have reason to be optimistic. The literature on the subject, including survey responses from industry participants, appears to indicate that ITAR was one of the major barriers to economic success and competitiveness overseas.¹²⁴ European firms were competing against United States firms on the basis of American companies' more stringent export controls, but this competitive advantage is seemingly gone. Where companies once turned to marketing ITAR-free satellites to circumvent burdensome regulations,¹²⁵ satellite manufacturers and exporters no longer need to acquire licenses that were approved a majority of the time anyway.¹²⁶ Now that many of the burdens are gone, the satellite industry can begin to grow organically, perhaps enough to make up for lost time and growth throughout the 1990s and early 2000s.

2. Treating Satellites Differently on the Basis of Function

In June 1998, Representative Lee Hamilton commended a newspaper article before the House that aptly foretold the effect of Congress's rash reaction to the Hughes and Loral incidents.¹²⁷ The article, co-written by a former National Security Advisor and a former Under Secretary of State for Political Affairs, ended with a warning:

If careful analysis determines that these safeguards have substantially achieved their objectives, then the imposition of blanket prohibitions on satellite launches by China would largely miss the point. On the one hand, it would not deal

123. Sutherland, *supra* note 15 ("The damage to U.S. commercial interests might be worthwhile if it truly protected military technologies. But it doesn't, many experts argue. Many of the technologies that militaries rely on—satellites for communications, munitions-guidance systems and unmanned aerial vehicles, to name a few—are now widely and legally available worldwide. A consensus is now emerging that export controls have actually hurt America's national security by chipping away at the ability of U.S. firms to innovate.").

124. BASE ASSESSMENT, *supra* note 27, at x, 42.

125. See de Selding, *supra* note 98.

126. BASE ASSESSMENT, *supra* note 27, at 40.

127. 144 CONG. REC. 11,696 (1998) (statement of Rep. Lee Hamilton).

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 377

with concerns about how campaign contributions—from Americans, to say nothing of Chinese—might influence government decisions in ways which produce commercial advantage. On the other hand, it could prove to be worse than redundant with the safeguards already in place, because it would both place American industry at a competitive disadvantage and do needless damage to our critically important relationship with China.¹²⁸

Unfortunately, what the former National Security Advisor predicted ultimately came to pass. The significant red tape put in place by the Strom Thurmond Act worked quickly to place America's commercial satellite industry at a disadvantage from a regulatory perspective.¹²⁹ Much of the commercial space industry's concern regarding the restrictive ITAR did not stem from disbelief in the United States' stated national security concerns; rather, the space industry's qualm with ITAR derived from the restrictions imposed on otherwise legitimate attempts to export satellite hardware or technology. For example, satellites launched into space for the sole purpose of scientific research would have to comply with regulations that were originally aimed at, and more appropriate for, military satellites. In addition, communications satellites, while having potential military applications, are relatively harmless when launched for purely commercial purposes. These frustrations are so commonly felt industry-wide that one lawyer wrote an article titled *Exporting Commercial Satellite Technology: Coping in the Current Regulatory Environment*.¹³⁰ When an industry must "cope" with regulations not present in other countries, the regulated country inevitably fails to attract worldwide business, all else being equal.¹³¹

Thus, businesses and industry professionals express legitimate and justified concerns with ITAR on an

128. Brent Scowcroft & Arnold Kanter, *What Technology Went Where and Why*, WASH. TIMES, June 5, 1998, <http://www.fas.org/news/china/1998/ed3.html>, archived at <http://perma.cc/9RGW-4BB7>.

129. See *supra* Part II.A.1.

130. Jonathan M. Epstein, *Exporting Commercial Satellite Technology: Coping in the Current Regulatory Environment*, ABA AIR & SPACE LAW., Fall 2001, at 17, available at <http://www.hklaw.com/publications/Exporting-Commercial-Satellite-Technology-Coping-in-the-Current-Regulatory-Environment-10-01-2001/>, archived at <http://perma.cc/5EYJ-3HVT>.

131. See Sutherland, *supra* note 15.

administrative front. But the 2013 NDAA and corresponding agency rules should go a long way toward assuaging the administrative burdens on commercial satellite manufacturers, operators, and exporters. For example, one fundamental administrative burden imposed by the old regime was the many export licensing requests that commercial satellite companies had to submit to the State Department; these simply would not have been required in most other space-faring countries.¹³² After Congress enacted the Strom Thurmond Act, which granted the State Department exclusive jurisdiction over *all* satellite exports, the United States became the only space-faring country that “control[led] all commercial satellites and related items, including technology, as munitions items.”¹³³ Furthermore, before the 2013 NDAA gave the president authority to reassign export control for commercial communications satellites and related hardware, the “United States [was] the only country that [controlled] reexport of foreign-origin satellites containing U.S.-origin satellite-related items. Some countries allow[ed] their items to be incorporated into a third party satellite and then reexported without further restrictions.”¹³⁴ Under the 2013 NDAA’s permissive language authorizing the president to determine the proper satellite export control regime, these draconian administrative barriers are poised to crumble. The law that gave sole satellite export jurisdiction to the State Department no longer exists. This basic but important equalizer should bring the United States more in line with other space-faring nations’ commercial satellite industries.

Even when commercial satellite businesses applied for licensing under ITAR, the export licensing process had become prohibitively cumbersome and slow. For example, between 2003 and 2006, the State Department’s processing time of one type of license under ITAR grew from one and a half months to over three months.¹³⁵ The process had become so burdensome and regulation-heavy that export control compliance costs averaged \$49 million per year between 2003 and 2006.¹³⁶

To some extent, the 2013 NDAA merely changes which

132. 2012 RISK ASSESSMENT, *supra* note 19, at 1.

133. *Id.*

134. *Id.*

135. BASE ASSESSMENT, *supra* note 27, at x, 42.

136. *Id.* at 35.

government agency commercial satellite companies will approach to obtain export licenses from the State Department to the Commerce Department. Shifting red tape is not the same as destroying it. But most small businesses and established market participants find the EAR much more conducive to commercial enterprises, making the 2013 NDAA a step in the right direction.¹³⁷

3. Building on the New Foundation

Over time, the list of space objects that are regulated through the State Department and ITAR has become narrower and more specific. This change was purposeful. By creating a specific list based on satellite characteristics and features rather than broad categories of application,¹³⁸ the State Department is attempting to “describe more precisely the articles warranting control on the [Munitions List].”¹³⁹ As a consequence, the State Department is effectively using one administrative rule to transfer export control jurisdiction to the Commerce Department for a broad array of space objects.

The narrow, characteristics-based list¹⁴⁰ provides a smart and flexible working model from which the State and Commerce Departments can pivot in later rulemaking proceedings. It will likely answer the concerns of a significant number of United States space-industry companies because it is less broad in scope. In a survey of over 250 space companies and business units, 60 percent called for the government to update United States export control lists more often so as to accurately reflect worldwide technological and competitive change.¹⁴¹ A narrow list means the list can be updated using a piecemeal approach to address specific future concerns. Congress need not be involved in the changes; the commercial satellite industry and other interested parties can petition the State and Commerce Departments for more appropriate rules over time through the traditional administrative rulemaking process. Given the popularity of the 2013 NDAA with Congress, however, there is a good chance that any substantial changes

137. See *supra* Part I.A.

138. See *supra* Part I.E.

139. Proposed Rule I, *supra* note 11, at 31,444.

140. *Id.*

141. BASE ASSESSMENT, *supra* note 27, at x, 42.

to the United States' export control regime in the future will be less burdensome than in the 1990s, when the Hughes and Loral incidents were at the forefront of Congress's attention.

By lifting the congressional mandate requiring all satellite exports to be licensed through the State Department, Congress gave the State and Commerce Departments room to begin responding to industry complaints through notice and comment rulemaking. Before the passage of the 2013 NDAA, satellite industry participants that desired a change in export licensing restrictions had to go through Congress because the Strom Thurmond Act had placed all satellites on the State Department's Munitions List.¹⁴² The more nimble administrative rulemaking proceedings provide a better outlet and a solid foundation for future, recurring updates to export control as technology and competitive markets change.

B. Potential Risks

With these indisputable gains come certain national security risks, including the risk that the Commerce Department and its EAR are ill-suited to address potential national security concerns through the licensing process. This section (1) discusses the national security risks posed by the Hughes and Loral incidents and whether those risks are addressed in the 2013 NDAA, and (2) assesses whether the Commerce Department is ready and able to tackle the licensing of commercial satellites.

1. National Security: Hughes and Loral Revisited

The most obvious and critical negative consequence of the 2013 NDAA is its potential impact on national security. To assess the potential national security risks associated with the amended language of Category XV of the Munitions List, one need only look to the congressional debate over the Strom Thurmond Act, including congressional hearings surrounding the Hughes and Loral incidents.

The rhetoric surrounding the debates preceding the passage of the Strom Thurmond Act was reminiscent of the

142. Strom Thurmond Act, *supra* note 11, § 1513.

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 381

Red Scare of the early 20th Century.¹⁴³ The Republican House took special issue with the Clinton Administration's connection with Hughes, but such political worries took a back seat to national security concerns.¹⁴⁴ One member of Congress commented:

The Department of Defense issued a statement that said American security interests have been harmed. That is the Department of Defense for the Clinton administration, very serious statement [sic]. It is clear that our policy with respect to transferring satellite technology to China has been detrimental to the United States. There may have been criminal activities, and we need to further explore this issue.¹⁴⁵

This rhetoric is representative of much of the congressional debate surrounding the passage of the Strom Thurmond Act. A quick thought experiment using the proposed rule changes by the State and Commerce Departments may help to illustrate the risk associated with the 2013 NDAA's impact on satellite export controls. Imagine that the Hughes incident happened in 2013 under the updated regime, including a version of the proposed rules currently before the State Department and Commerce Department. The facts are exactly the same except the nation providing launch services for Hughes is Country X rather than China—remember: under the updated regime, companies are banned from exporting satellites to China, North Korea, or any state sponsors of terrorism.

Under the old regime, Hughes violated American export controls when, with explicit approval from the Commerce

143. See 144 CONG. REC. 12,881 (1998) (statement of Rep. Gerald Solomon) (“Beginning in April of this year . . . the *New York Times* has focused on the somewhat sordid history of the transfer of American satellite technology to Communist China. These press accounts have asserted . . . that American national security has been severely damaged, and campaign contributions may have been a factor in the decisions made.”); see also *id.* at 12,901 (statement of Rep. Christopher Cox) (“All of these media reports give rise to a number of unanswered questions that will be the object of the Select Committee’s focus. There is no more important question before the Select Committee than the one with which we will begin. ‘Has the reliability or accuracy of nuclear missiles in the arsenal of the People’s Liberation Army been enhanced; and, if so, how did this happen?’”).

144. See *id.* at 12,881, 12,901.

145. 144 CONG. REC. 9,905 (1998) (statement of Rep. Duncan Hunter).

Department, it transferred launch failure investigation materials to China that had the potential to assist China in making more reliable ballistic missiles.¹⁴⁶ Under the updated regime, it seems that Hughes's initial request would once again require licensing from the Commerce Department through the satellite's presence on the EAR's CCL. If the launch of the satellite failed and an investigation ensued, it is evident that any transfer of technical data with potential military application would require a State Department export license, just like Hughes needed a State Department license to transfer sensitive data to China in the mid-1990s. Thus, if Congress intended the 2013 NDAA to address the problems specifically caused by the Hughes and Loral incidents while making economic progress in the satellite industry, it is unclear whether the recent change in policy will prevent similar incidents from occurring again in the future. The updated regime has the same potential to fail as the old regime. Where the updated regime succeeds, however, is in its treatment of satellites with no obvious military application. The updated regime provides the flexibility modern satellites require, but also addresses the national security concerns the old regime sought to address.

Furthermore, whether the updated regime's similar treatment of an incident akin to the Hughes and Loral launch failures is a problem at all is an open issue, as it is unclear that the Hughes and Loral incidents ever posed the national security concerns outlined in the Cox Report.¹⁴⁷ This is especially relevant for a discussion of the 2013 NDAA's potential risks because if the Hughes and Loral incidents never posed a threat to America's national security in the first place, then the 2013 NDAA's negative national security implications are less severe. Importantly, in the years after the Hughes and Loral accidents, various reports sought to disprove Congress's initial concern regarding the transfer of missile technology to China.¹⁴⁸ One particular report, written by Stanford

146. See ALASTAIR IAIN JOHNSTON ET AL., THE COX COMMITTEE REPORT: AN ASSESSMENT 9–11, 82 (Michael M. May ed., 1999), available at <http://iis-db.stanford.edu/pubs/10331/cox.pdf>, archived at <http://perma.cc/FYJ9-NHFG>.

147. *Id.* at 89, 91.

148. *Id.* at 82 (“While numerous reports have been published criticizing the conclusions of the nuclear section (e.g., the President’s Foreign Intelligence Advisory Board’s ‘Rudman [R]eport’), much less has been published challenging the missile and space accusations, although both Loral and Hughes have

2015] OVERREACTION THAT DESTROYED AN INDUSTRY 383

University's Center for International Security and Cooperation, expressed doubt as to the validity of many of the claims made within the Cox Report.¹⁴⁹

Based on my analysis of the process leading to the committee's conclusions, I would advise that considerable caution be observed before using the report's information as a basis for export-control policy and legislation; for understanding of the PRC's present and future missile force capabilities and their threats to U.S. interests; and for assessing the PRC espionage threat to U.S. commercial satellite technology.¹⁵⁰

If the relative risk of sensitive technology transfers was always low, there may never have been a reason to transfer sole satellite export licensing authority to the State Department in the first place. The Strom Thurmond Act, in its embodiment of fear over the Hughes and Loral incidents, may truly have been an overreaction that destroyed an industry. If so, the 2013 NDAA does nothing drastic to change export controls from a national security perspective, and the minimal historical evidence that commercial satellite exports help foreign powers improve their military technology becomes moot.

2. Is the Commerce Department Ready and Able?

There is also a concern over the Commerce Department's ability to properly handle satellite export licensing responsibility. Senator John McCain, during a Senate hearing on the transfer of satellite technology to China in 1998, insisted that the Commerce Department was not the agency best suited to handle satellite export controls.¹⁵¹ Because the Commerce Department's licensing decisions had traditionally been predicated on political and economic factors rather than national security concerns, Senator McCain felt the Commerce Department was ill-equipped to properly assess national

vigorously denied the charges of export regulation and license violations.”).

149. *Id.*

150. *Id.*

151. Allen, *supra* note 17, at 481 (citing *Transfer of Satellite Technology to China: Hearing Before the S. Comm. on Commerce, Science, & Transportation*, 105th Cong. 5–6 (1998) (statement of Sen. John McCain)).

security concerns related to sensitive technology and hardware.¹⁵² Although Senator McCain's comments came before the issuance of the Cox Report, the Cox Report substantiated Senator McCain's claim.¹⁵³ Faced with Hughes's launch failure investigation reports, the Cox Report found that the Commerce Department rubber-stamped the documents for transmission to China.¹⁵⁴

To some extent, the American satellite export control regime post-2013 NDAA looks much like the export control regime that characterized the period between 1993 and 1998. Prior to the Strom Thurmond Act, the Commerce Department licensed commercial satellite exports generally, but the State Department retained control over the export of technical data that could assist foreign countries in developing or improving military rocket systems.¹⁵⁵ This split in jurisdiction led to much of the controversy surrounding the Hughes and Loral incidents.¹⁵⁶ In the Hughes case especially, split jurisdiction caused miscommunication and licensing issues.¹⁵⁷ The Commerce Department's approval of the transfer of materials to China under the satellite's original Commerce Department license was later found to violate the State Department's ITAR.¹⁵⁸ Because under today's regime the State Department retains jurisdiction over technical data that could improve foreign nations' military prowess,¹⁵⁹ there is no reason the Hughes incident could not happen again. In other words, the complicated aspect of export licensing that deals with potential military application, the type of work Senator McCain was worried the Commerce Department could not handle, is still reserved for the State Department. The new characteristics-based approach to defining satellites subject to export control demarcates the jurisdictional line between the Commerce Department and State Department in much clearer terms after the 2013 NDAA than the approach taken between 1999 and 2012.

152. *See id.*

153. *See supra* Part I.C.

154. *See supra* Part I.C.

155. *See* COX REPORT, *supra* note 5, ch. 5, at 3–4.

156. *See supra* Part I.C.

157. *See supra* Part I.C.1.

158. *Id.*

159. *See supra* Part II.A.3.

C. *New Technologies, New Problems*

The proposed language of Munitions List Category XV shows unmistakable signs of progress with regard to improving America's competitiveness in the global commercial satellite market.¹⁶⁰ That being said, the 2013 NDAA and corresponding proposed rules from both the Commerce Department and State Department may not go far enough in excluding certain satellite technologies from ITAR regulations.

One notable omission from the proposed rule changes is the Global Positioning System (GPS) subsection of Category XV of the Munitions List.¹⁶¹ The GPS subsection provides that the State Department, under ITAR, has export licensing authority over "[GPS] receiving equipment specifically designed, modified or configured for military use; or GPS receiving equipment . . . [d]esigned for producing navigation results above 60,000 feet altitude and at 1,000 knots velocity or greater . . ."¹⁶² Most satellites contain GPS-receiving equipment that can produce navigation results that fall within the Munitions List provisions out of necessity given satellites' ultimate destination in space: low Earth orbit.¹⁶³ Theoretically, this one provision within the Munitions List could transfer an entire satellite from the Commerce Department's EAR to the State Department's ITAR.

The GPS Munitions List provision should be a cause for concern among entrepreneurs currently breaking into the commercial satellite industry. Space entrepreneurs with limited access to capital will inevitably choose certain satellite technologies that offer affordable access to space, including GPS units manufactured to operate at levels in excess of those outlined in the Munitions List. One of these technologies, the CubeSat, is becoming increasingly popular.¹⁶⁴ A CubeSat is a

160. See Proposed Rule I, *supra* note 11, at 31,444.

161. See *id.*

162. 22 C.F.R. § 121.1, Category XV(c)(2) (2014).

163. *Orbital Parameters*, AUSTL. SPACE ACAD., <http://www.spaceacademy.net.au/watch/track/leopars.htm> (last visited Aug. 3, 2014), *archived at* <http://perma.cc/RU3Y-392K> (defining low Earth orbit to include satellites at a minimum of 200km above sea level with a velocity of at least 7.79km/s, well above the ranges listed on the Munitions List).

164. See, e.g., Klaus Schmidt, *CubeSats and Robotics on Station Thursday*, SPACE FELLOWSHIP (Feb. 28, 2014, 5:47 AM), <http://spacefellowship.com/news/art37414/cubesats-and-robotics-on-station-thursday.html>, *archived at* <http://perma.cc/MUM9-XCCE>.

type of nano-satellite¹⁶⁵ that is a ten-centimeter cube with a mass of up to 1.33 kilograms.¹⁶⁶ This CubeSat standard, to which a nano-satellite must conform to be considered a “CubeSat,” began as a collaborative effort between Professor Jordi Puig-Suari at California Polytechnic State University and Professor Bob Twiggs at Stanford University in 1999.¹⁶⁷ The primary purpose behind the development of the CubeSat standard was to provide affordable access to space for small payloads.¹⁶⁸ These small satellites are commonly put on rockets as a secondary payload for larger satellites.¹⁶⁹ After being placed into orbit, the small satellites are activated and are incredibly useful given their size.¹⁷⁰ Some entrepreneurs are using CubeSats for their potential for remote sensing; others use them to allow primary school students access to a type of in-orbit research lab.¹⁷¹ The potential uses for nano-satellites appear limitless, but new ventures created to take advantage of the nano-satellite platform may very well run into ITAR obstacles, even in the face of new improvements in the United States’ export control policy.

To accommodate future innovation and a booming commercial industry, future iterations of the ITAR and EAR should include a categorical exception for satellites that

165. Nano-satellite is a term identifying satellites within a particular weight group. Weight classifications are often used to identify small satellite sub-groups. For example, a nano-satellite is a satellite weighing between one and ten kilograms. See Neta Palkovitz & Tanja Masson-Zwaan, *Orbiting Under the Radar: Nano-Satellites, International Obligations and National Space Laws*, in PROCEEDINGS OF THE INTERNATIONAL INSTITUTE OF SPACE LAW 2012 566, 567 (2012).

166. CUBESAT PROGRAM, CAL POLYTECHNIC ST. U. SAN LUIS OBISPO, CUBESAT DESIGN SPECIFICATION REV. 12, at 5 (2009), available at http://www.srl.utu.fi/AuxDOC/tke/radmon/cubesat_standard.pdf, archived at <http://perma.cc/YQ58-C4UL> [hereinafter CUBESAT DESIGN SPECIFICATION].

167. *Id.*

168. *Id.*; see also Davide Castelvechi, *Affordable Orbital: Tiny Satellites Make for Democratic Access to Space*, SCI. AM. (Feb. 9, 2011), <http://www.scientificamerican.com/article/cubesats-photos/>, archived at <http://perma.cc/JK3G-9CM8> (“Developing, testing, launching and operating a space science mission typically costs hundreds of millions to billions of dollars, but a new breed of satellites lowers the price tag to just \$100,000 or so.”).

169. CUBESAT DESIGN SPECIFICATION, *supra* note 166, at 5.

170. *See id.*

171. See Stephen Clark, *Earth Observation Satellites Deployed from Space Station*, SPACEFLIGHT NOW (Mar. 4, 2014), <http://www.spaceflightnow.com/station/exp38/140304flock/#.UyaNB15sgZE>, archived at <http://perma.cc/6CFX-N8SF>; ARDUSAT.COM, <http://www.ardusat.com/> (last visited Sept. 18, 2014), archived at <http://perma.cc/X65X-3KBY>.

conform to the CubeSat standard. The logic that motivated the change to the ITAR to include commercial satellites on the Munitions List does not extend to CubeSat technology. All CubeSats should be exempt from complying with the ITAR because of their unique form factor, their commercial availability, and their open-source nature. The CubeSat standard was publically developed, and is publically available (i.e., open source).¹⁷² Satellites conforming to the CubeSat standard are becoming increasingly available at consumer-level prices.¹⁷³ With their increased availability and affordability, CubeSats warrant exclusion from the updated export controls to prevent would-be entrepreneurs from abandoning industry-disrupting ideas because of burdensome regulations.

New technologies will undoubtedly come along that require the United States' satellite export control regime to change once again. With the 2013 NDAA, the government's ability to pivot has never been greater.

CONCLUSION

The 2013 NDAA not only returned to the president the authority to determine which export control regime would have jurisdiction over commercial satellites, it also returned to the American space industry a great deal of competitive power. The economic payoff and potential for future legislation to further improve upon the United States' export control regime outweigh the potential risks that may arise due to the more lax export control standards. As a result of Congress coming to terms with its overreaction in the 1990s, the future of the American commercial space industry looks bright. Space entrepreneurs are leveraging technology that was not imaginable a decade ago. The latest changes to America's export control regime go a long way toward enabling the faster and smarter development of space.

172. CUBESAT DESIGN SPECIFICATION, *supra* note 166, at 1.

173. See, e.g., *CubeSats*, BLUE CANYON TECHS., http://bluecanyontech.com/all_products/cubesats/ (last visited June 2, 2014), archived at <http://perma.cc/SKM6-N2AV>.