

Testimony before the U.S.-China Economic and Security Review Commission

Hearing on *China in Space: A Strategic Competition?*

by

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April 25th, 2019

I. Introduction and Background:

I appreciate the opportunity to testify before the Commission. My name is Mike Gold and I am Vice President for Regulatory and Policy at Maxar Technologies (“Maxar”). Maxar combines four heritage businesses, Space Systems Loral (“SSL”), the world’s most prolific commercial communications satellite manufacturer and a global leader in space-based propulsion and robotics; DigitalGlobe, the world’s leading commercial source of satellite imagery, geospatial information, and location-based intelligence; Radiant Solutions, which provides state-of-the-art geospatial analysis and intelligence leveraging next-generation artificial intelligence (“AI”) and machine learning capabilities; and MDA, which develops and delivers advanced surveillance solutions, defense and maritime systems, radar geospatial imagery, and space-based robotics. Maxar has approximately 6,000 employees spread across numerous locations throughout the U.S. and Canada.

Today, I am here to focus on Maxar’s communications satellite manufacturing business which is executed by our heritage SSL team primarily out of facilities in California. Maxar traces its commercial satellite pedigree back to Philco and Ford Aerospace, and was one of the first tech companies to develop in Silicon Valley. We were in Silicon Valley when the only Apple presence existed via the numerous orchards that surrounded our facility. Since that time, our company has gone on to lead the world in commercial geosynchronous (“GEO”) satellite manufacturing, with more of our GEO satellites in orbit than any other company. Maxar boasts a total of roughly 270 satellites launched, with approximately 80 still in orbit, and an unprecedented 2,200 on-orbit years of experience.

However, due to the dramatic downturn in the GEO commercial satellite market, it is an extraordinarily challenging time, even for a leading company like Maxar. Over the course of the last few years, annual global GEO commsat orders have dipped from an average of 20 orders per year to just 8 orders per year for the last two years, with only two orders so far in 2019.¹ Further exacerbating these difficulties is new and robust competition from China.

¹ *Recently awarded GEO-Sat Contracts*, GUNTER’S SPACE PAGE, https://space.skyrocket.de/doc_sat/sat-contracts.htm (last updated Apr. 18, 2019); Satellite Industry Association, *State of the Satellite Industry* (2018), <https://www.sia.org/wp-content/uploads/2018/06/2018-SSIR-2-Pager-.pdf>.

II. China's Satellite Manufacturing Strategy and Successes:

China has made great strides in satellite manufacturing in a shockingly short amount of time. A little more than a decade ago, China lost both of its initial GEO communications satellites, Sinosat-2² and Nigcomsat-1,³ to solar array malfunctions in 2006 and 2008 respectively. Today, China has become a global leader in satellite manufacturing, producing 40 satellites in a two-year period, a rate that rivals the productivity of the U.S. and Europe.⁴

China's growth strategy has focused on establishing a 'Space Silk Road' developing regional customers by leveraging China's economic and political influence.⁵ Specifically, China has had great success in building, launching, and operating satellites for countries such as Venezuela, Nigeria, Pakistan, Sri Lanka, Belarus, and Laos.⁶ Satellite sales to these nations are part of a much broader economic and political plan to support Chinese strategic objectives via the Belt and Road initiative ("BRI") as described in an Observer Research Foundation Special Report on China's Design to Capture Regional SatCom Markets from July of 2018.

"That China is seeking resources as well as markets for its products through the BRI is known. The electromagnetic spectrum and geostationary orbital positions are also natural resources and heavily contested. The number of government and commercial entities owning a satellite is increasing. The international launch contracts not only give China revenue from the upstream activities (satellite manufacturing and launch) but also downstream business opportunities (space services – images or broadcasting) with some of the customers. China is developing its customers into regional hubs for satellite services.

For example, China is investing into SupremeSat to help it become the South Asian regional hub for space services. Where feasible, the satellites are being controlled by new companies established for this specific purpose. China could then obtain stakes in those companies such as NigComSat in exchange for funding its two new satellites. China will be entering into cost and revenue sharing satellite contracts with Pakistan. SupremeSat is receiving major funds from China. Chinese companies command 55 percent share in the LaoSat-1 joint venture company. When Belintersat-1 was purely interested in satellite services export revenue, NigComSat entered into a partnership for servicing Belarus' African market."⁷

China intends to capture a majority share of the global communications satellite and launch market by developing strong relationships with countries that are adverse to U.S. interests

² *Sinosat 2, 4 (Xinnuo 2, 4)/ZX 9A (ChinaSat9A)*, GUNTER'S SPACE PAGE, https://space.skyrocket.de/doc_sdat/sinosat-2.htm (last updated Dec. 11, 2017).

³ *NIGCOMSAT 1, 1R*, GUNTER'S SPACE PAGE, https://space.skyrocket.de/doc_sdat/nigcomsat-1.htm (last updated Dec. 11, 2017).

⁴ Caleb Henry, *Back-to-back commercial satellite wins leave China Great Wall hungry for more*, SPACENEWS (Aug. 22, 2017), <https://spacenews.com/back-to-back-commercial-satellite-wins-leave-china-great-wall-hungry-for-more/>.

⁵ Vidya Sagar Reddy, *China's Design to Capture Regional SatCom Markets*, ORF Special Report No. 70, 15 (July 2018), https://www.orfonline.org/wp-content/uploads/2018/07/ORF_SpecialReport_70_China_SatCom.pdf.

⁶ *Id.* at 2.

⁷ *Id.* at 16.

(e.g., Venezuela) and using such nations as gateways to pursue regional opportunities.⁸ Like other BRI projects, China is financing satellite launch and manufacturing. Politics clearly looms large in much of China's international satellite manufacturing and launch work, and may even have primacy over economic gains.⁹ China provides the capital via loans for allied nations to purchase China Great Wall Industry Corporation ("CGWIC") satellites, and it's currently unclear whether China can actually generate profits from these agreements or, alternatively, if China is simply willing to operate at a loss to enjoy nontrivial strategic and technological benefits.¹⁰

Although China has focused on developing nations and political allies, CGWIC is already achieving success with traditional satellite fleet operators. For example, in October of 2016, CGWIC won a breakthrough contract for a high-throughput Ka-band broadband satellite for Thailand's Thaicom via its subsidiary International Satellite Co. Ltd. for a value of \$208 million.¹¹ China followed this victory by winning another contract in May 2017, this time from Palapa Satelit Nusantara Sejahtera, a joint venture of Indosat Ooredoo and Pasifik Satelit Nusantara (PSN), for Palapa-N1, a high-throughput Ku-band satellite with 10 Gbps of capacity.¹² These two wins for CGWIC were the first instances of China taking away satellite manufacturing business that otherwise could have gone to American, European, or Japanese manufacturers.

CGWIC's success was based in no small part on aggressive financing. Specifically, when Maxar's heritage SSL business unit sought to compete for Palapa-N1 in 2016, we discovered that CGWIC was offering 70% financing to PSN which would be immediately available at contract signing. It normally takes at least 6 months after contract signing and often up to a year for satellite financing to be released. Because SSL couldn't even begin to compete with such aggressive financing terms, we did not pursue Palapa-N1, surrendering the jobs, revenue, and innovation that the satellite manufacturing work provided to China.

III. Policy Recommendations:

A. Revive the Export-Import Bank

Again, China is seeking to capture a majority share of the global satellite manufacturing market.¹³ The eventual loss of domestic commercial satellite manufacturing capabilities represents a nontrivial threat to the U.S. industrial base and national security. Therefore, at a moment when GEO telecommunications satellite sales are at an all-time low, Congress must move with alacrity to prevent yet another high-tech manufacturing capability from being lost to overseas competition.

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*

¹¹ Peter B. de Selding, *China wins breakthrough contract for Thaicom telecommunications satellite*, SPACE NEWS (Oct. 28, 2016), <https://spacenews.com/china-wins-breakthrough-contract-for-thaicom-telecommunications-satellite/>.

¹² Henry, *supra* note 4.

¹³ Reddy, *supra* note 5 at 16.

SSL's experience with Palapa-N1 is directly relevant to a potential solution. CGWIC won the Palapa-N1 primarily because it could offer aggressive financing and, without the Export-Import Bank ("Ex-Im" or the "Bank"), domestic satellite manufacturers will be unable to compete with Chinese or, for that matter, rival European and Japanese firms. Satellite development is an inherently long-term exercise. Financing is always required since revenue cannot be generated for years while a satellite is being manufactured and later deployed. Without financing, the economics of satellites would collapse, yet U.S. manufacturers have been facing this very scenario due to an incapacitated Ex-Im.

Although the Ex-Im was reauthorized by Congress in 2015, the Bank is unable to approve any transactions greater than \$10 million in value since it lacks a quorum of three voting board members.¹⁴ The Bank has been in this position for nearly five years and the economic impact on American businesses has been devastating. At the peak of Ex-Im's activity in 2012, the Bank financed \$35.8 billion in transactions, supporting thousands of small businesses and 255,000 U.S. jobs.¹⁵ In 2017, Ex-Im supported just \$3.4 billion in transactions, less than 10 percent of its activities from five years earlier.¹⁶ Moreover, \$43 billion worth of export deals for U.S. businesses are currently being held up due to Ex-Im inaction, resulting in massive amounts of jobs, innovation, and revenue going overseas to countries with active Export Credit Agencies ("ECAs").¹⁷

"Because EXIM is sidelined, El Al is outfitting its new fleet of Boeing planes with Rolls Royce engines made in the UK instead of GE engines from Ohio. A \$2 billion Egyptian order of industrial equipment—which translates to at least 10,000 jobs—will be sourced in Canada and Europe, not the U.S., for the same reason. Many U.S. companies are losing contracts or being forced to source from abroad as we step aside while country after country steps up to help their companies win deals we leave on the table. Today, there are nearly 100 ECAs around the world."

- Fred P. Hochberg, former Chair of the U.S. Export-Import Bank¹⁸

Without Ex-Im, competing in what is already a very difficult global satellite manufacturing market could become problematic. Even once the Ex-Im is fully revived, competing with CGWIC in particular will be difficult, since the financing provided by the Ex-Im pales in comparison to aggressive ECA support that China is providing to its manufacturers. China and other nations are exploring how to or already have gone beyond traditional ECA activities, while the U.S. has been unable to even resuscitate Ex-Im, leaving domestic high-tech companies that are vital to the U.S. industrial base and the country's national security at a dramatic disadvantage relative to China and every other industrialized nation which have uniformly embraced ECAs.

¹⁴ Thomas Wade, *Four Years On—Reauthorizing the Export-Import Bank: A Policy Evaluation*, AMERICAN ACTION FORUM (Jan. 15, 2019), <https://www.americanactionforum.org/insight/four-years-on-reauthorizing-the-export-import-bank-a-policy-evaluation/>.

¹⁵ Fred P. Hochberg, *The Senate is making a big mistake as it drags its feet over EXIM Bank confirmations*, CNBC (July 18, 2018, 11:39 AM), <https://www.cnbc.com/2018/07/17/ex-im-bank-needs-senate-support-to-save-us-jobs.html>.

¹⁶ *Id.*

¹⁷ Wade, *supra* note 14.

¹⁸ Hochberg, *supra* note 15.

American companies just want a chance to compete on an even playing field, or at least one that isn't tipped completely toward foreign competition.

The Trump administration recently acknowledged the vital importance of the Ex-Im to both the nation's economy and security. Last month, Larry Kudlow, the Director of the U.S. National Economic Council, called the Ex-Im Bank a "financial tool and a national security weapon".¹⁹ Combined with traditional favorable views of the Bank from Democrats, Ex-Im should enjoy bipartisan support. However, the Senate has yet to take action and it's unclear when or if this will change. Therefore, I implore this Commission in its recommendations to Congress to strongly support the restoration of the Ex-Im Bank, not only to help America compete with China economically but, as Larry Kudlow described, as a vital means of defending our country.

B. Export Control Reform

While necessary, export controls can, and often have been, implemented in a counterproductive fashion.²⁰ Due to legitimate concerns over Chinese investments in Silicon Valley and venture capital funds, the FY 2019 National Defense Authorization Act called for the Department of Commerce to establish appropriate controls for "emerging and foundational technologies".²¹ These emerging and foundational technologies include a wide variety of critical capabilities such as artificial intelligence, quantum computing, and advanced robotics.²²

Again, while export controls in these areas are justified, particularly relative to China, the Departments of Commerce, State, and Defense, as well as other Executive Branch agencies, must not implement controls in a counterproductive manner. Many of these emerging and foundational technologies are being developed in a global fashion involving cross-border financing and substantive international collaborations. If U.S. companies are constructively prohibited from entering into these global partnerships and obtaining foreign financing, American efforts and progress will be stymied. Accordingly, when America withdraws from advancing global technological development, it provides an excellent opportunity for China to fill the leadership void.

Therefore, in its recommendations to Congress and the Executive Branch, this Commission should endorse a balanced approach to export controls, wherein higher walls are constructed around smaller areas. Specifically, any new export controls for emerging and foundational

¹⁹ Jeffrey Rodack, *Kudlow Dubs Beleaguered Ex-Im Bank a 'National Security Weapon,'* NEWSMAX (Mar. 28, 2019, 1:26 PM), <https://www.newsmax.com/newsfront/larry-kudlow-banks-security-exports/2019/03/28/id/909139/>.

²⁰ See Michael N. Gold, *The Wrong Stuff: America's Aerospace Export Control Crisis*, 87 NEB. L. REV. (2008), <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1025&context=nlr>, 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 (2008), and Mike N. Gold, *Thomas Jefferson, We Have a Problem: The Unconstitutional Nature of the U.S.'s Aerospace Export Control Regime as Supported by Bernstein v. U.S. Department of Justice*, 57 CLEV. ST. L. REV. 629 (2009).

²¹ John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232; See also Review of Controls for Certain Emerging Technologies, 83 Fed. Reg. 58201 (proposed Nov. 19, 2018) (to be codified at 15 CFR pt. 744), <https://www.federalregister.gov/documents/2018/11/19/2018-25221/review-of-controls-for-certain-emerging-technologies>.

²² See Review of Controls for Certain Emerging Technologies, 83 Fed. Reg. 58201.

technologies can and should address concerns over Chinese competition. However, any such regulations should be balanced with rules and reforms allowing U.S. companies to enter into robust partnerships and joint collaborations with NATO and major non-NATO allies. Export controls are a double-edged sword which must be wielded carefully in order to avoid harming the very interests that are meant to be defended.

C. Satellite Servicing and In-Space Assembly

Per Congressional testimony in 2017 from the Director of National Intelligence, Dan Coats, America has never been more dependent upon its orbital assets and they have never been under greater threat.²³ China and Russia are developing directed energy weapons, conducting missile tests, and deploying robotic systems, all with the goal of gaining the ability to disable America's critical public and private sector satellites.²⁴ Therefore, it's vital that the U.S. take action to bolster the resilience of our space-based infrastructure.

Maxar Technologies is developing robotic systems that will be able to service satellites in orbit. For example, Maxar is supporting NASA's Restore-L mission which, for the first time, will result in a robotic system that will refuel a satellite in low Earth orbit ("LEO"). Maxar is also supporting NASA's In-Space Robotics, Manufacturing, and Assembly ("IRMA") Tipping Point program to build and demonstrate space-based robotics that can assemble parts of a satellite after it achieves orbit. Additionally, DARPA is working on the Robotic Servicing of Geosynchronous Satellites ("RSGS") program to create a robotic vehicle that can repair and refurbish satellites. The capabilities resulting from programs such as Restore-L, Tipping Point, and RSGS will substantially enhance the resilience of all of America's orbital assets, diluting if not eliminating the efficacy of many anti-satellite systems in a peaceful, commercial fashion.

However, for these new systems to come to fruition, continued support from both Congress and the Executive Branch will be required. Therefore, the Commission should recommend to Congress that full funding be provided to programs such as Restore-L and IRMA.

Moreover, the Commission should recommend that NASA, the Department of Defense, and other federal agencies, leverage in-space satellite servicing systems and in-space assembly capabilities as customers. While the federal government is not able to provide direct subsidies and financial support in the robust manner that we see in China and Europe, what government agencies and departments can do is leverage the power of the purse to become an active customer for these capabilities. In the words of Doug Loverro, former Deputy Assistant Secretary of Defense for Space Policy, we eventually won't be able to outspend China in space, but we can 'out entrepreneur them'.²⁵ If U.S. Government entities purchase satellite refueling, repair, and in-space assembly services, these capabilities will be developed and matured by companies such as Maxar, unleashing the power and efficiencies of the private sector in support of protecting America's orbital assets. For all of these reasons, the Commission should

²³ *Worldwide Threat Assessment of the US Intelligence Community: Hearing on Worldwide Threats Before the S. Comm. On Armed Services*, 115th Cong. (2017) (statement of Dan Coats, Dir. of Nat'l. Intelligence).

²⁴ *Id.*

²⁵ Doug Loverro, Dinner Keynote Address before the Commercial Space Transportation Advisory Committee (October 2016).

recommend to the Executive Branch that all relevant agencies and departments take every opportunity to act as customers for American satellite servicing and in-space assembly capabilities.

IV. Conclusion:

China is emerging as a strong competitor in the communications satellite manufacturing field, aggravating the already numerous challenges that domestic companies such as Maxar face. The Commission should therefore strongly recommend that Congress and the Executive Branch work together to resuscitate the Export-Import Bank as quickly as possible. Moreover, the Commission should recommend that future export controls for emerging and foundational technologies must be implemented in a manner that allows U.S. companies to lead and innovate in collaboration with NATO and major non-NATO allies. Finally, the U.S. Congress and the Executive Branch need to move with alacrity to support the development and growth of domestic satellite servicing and in-space assembly programs to enhance the resilience of America's critical orbital assets. If the Commission makes these recommendations and they are adopted by Congress and the Executive Branch, American economic and national security will both be much stronger in relation to China and the rest of the world.