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Background

Executive Summary

No. 1198

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COMMERCIAL SPACE COOPERATION SHOULD NOT HARM NATIONAL SECURITY

RICHARD D. FISHER, JR.

A current controversy in Washington, D.C., surrounds the possible leakage of sensitive missile technology to China during American commercial use of Chinese satellite launch services. The Clinton Administration has been quick to minimize the likelihood that China would use such missile technology or know-how to advance its military missile program. For example, on June 3, 1998, National Security Adviser Sandy Berger stated, "Satellites exported to China for launch are not used for military purposes, nor do they result in the transfer of missile technology." Yet, according to a U.S. Air Force intelligence finding approved by the Department of Defense's Defense Technology Security Administration (DTSA) and reortedly issued in May 1997, U.S. missile technology and information provided to China by Space Systems/Loral in a commercial satellite launch project may have helped China improve guidance systems for its ballistic missiles. Indeed, the DTSA reportedly concluded that "United States national security has been harmed."

This controversy strongly suggests that the Clinton Administration must reassess its priorities. Its desire to improve commercial space cooperation with China has outweighed the U.S. need to promote successful arms control with China and deter China's growing military missile capabilities.

Congress has begun investigating the serious security threat posed by such access to U.S. dual-use missile technology. China already may possess 18 8,000-mile-range intercontinental ballistic missiles (ICBMs) that are capable of reaching the United States; these old liquid-fueled missiles undoubtedly will be replaced by modern, solid-fueled, and highly mobile ICBMs. If information and technology gained by improvements to China's commercial space launch vehicles could be used to advance the capabilities of these military ballistic missiles, then the threat posed by these missiles to U.S. territory is much greater.

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Without a national ballistic missile defense system in place, both houses of Congress are right to be concerned. The bipartisan investigations should examine a variety of issues surrounding the possible transfer of U.S. missile technology to China, such as whether revenue from commercial

space cooperation in fact is subsidizing China's military missile program, and whether access to U.S.-made communications satellites is helping China's military improve its satellite communications network. Although there are concerns that campaign donors may have influenced the granting of presidential "waivers" that allow Chinese space launches of U.S. satellites in the face of sanctions, and that a Chinese aerospace official, with ties to that country's top leadership, may have helped to funnel foreign money to a U.S. political party, the most important concern for Congress today should be whether U.S. national security has been compromised.

The Clinton Administration's focus on commercial concerns is also questionable in light of its inability to convince China to sign the 1989 Missile Technology Control Regime (MTCR), which would bar China's sale of dangerous missile technology to such countries as Pakistan and Iran. The nuclear arms race between these two countries is complicated by China's assistance to Pakistan's nuclear program since the 1970s. Clearly, an emphasis on commercial space cooperation with China over arms control is the wrong approach. The Administration should place the greatest emphasis on national security issues when dealing with China. The proper strategy for U.S. relations with China should include:

- Suspending U.S. satellite exports to China pending the outcome of congressional investigations. This would send China the message that commercial space cooperation is less

important than protecting U.S. security interests.

- Rebuilding technology export controls and a multinational military technology control regime to replace the lapsed Coordinating Committee for Multilateral Export Controls.
- Building an effective defense against nuclear missiles in the face of an increased probability that China will build better medium- and long-range ICBMs.
- Devising a realistic arms control strategy toward China that rewards China's compliance, not its rhetoric.

The escalating missile competition in South Asia and China's missile modernization suggest potentially serious future threats to U.S. national security. Congress is correct to investigate the possibility that there has been a transfer of U.S. missile technology and know-how to China through commercial space cooperation. Unless the Clinton Administration readjusts its priorities to place the proper weight on national security in its dealings with China, the risks to security from continued commercial space cooperation remain too high. A far better approach for the Administration to take in developing a China policy should emphasize security and deterrence over commercial cooperation in such sensitive areas as space technology.

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Backgrounder

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COMMERCIAL SPACE COOPERATION SHOULD NOT HARM NATIONAL SECURITY

RICHARD D. FISHER, JR.

A current controversy in Washington, D.C., surrounds the possible leakage of U.S. missile technology to the People's Republic of China through the commercial use of Chinese satellite launchers. American companies are using Chinese space launch services to launch U.S. satellites with increasing frequency because they are less expensive than their counterparts in the United States. Yet, in at least one instance, U.S. technology that China's military could use to advance its military missile program may have been transferred through the commercial launch process. Acquiring such dual-use technology could allow China to build missiles capable of targeting the United States and its allies. The controversy surrounding this incident strongly suggests that the Clinton Administration's desire to promote commercial space cooperation with China has inappropriately outweighed its desire to resolve strategic security concerns with China. This imbalance in priorities may have caused Clinton Administration officials to minimize the likelihood that U.S. missile technology and know-how was transferred through commercial space cooperation.

The Clinton Administration tried to entice China to join a missile technology control convention by offering this increased civilian commercial space cooperation, but so far this effort has failed.

Yet China's role in the proliferation of nuclear weapons in South Asia, which helped to accelerate the nuclear race between India and Pakistan, may mean that even China now will begin to feel the need to improve its missile forces. This possibility increases the security threat to the United States and its allies significantly. Clearly, when President Bill Clinton meets President Jiang Zemin in China in the next few days, national security must receive greater emphasis than commercial space cooperation.

Both houses of Congress recently began investigating the serious issues surrounding the transfer of U.S. missile technology to China. Although National Security Adviser Samuel R. Berger has stated that "Satellites exported to China for launch are not used for military purposes, nor do they result in the transfer of missile technology,"¹ recent reports suggest the U.S.

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government has known for at least two years that China's military was using communications satellites made in the United States. Congress should ascertain whether national security has been compromised by Clinton Administration policies that promote commercial space cooperation—such as its decision to restrain the role of the Department of Defense in granting satellite export licenses—while failing to gain China's cooperation on missile proliferation and other security issues.

Congress should take the lead in developing new policies that emphasize the importance of protecting U.S. national security. The Clinton Administration should be encouraged to suspend U.S. commercial satellite launches from China until the congressional investigations are concluded. In addition, the United States should promote (1) a new multilateral military technology control regime to prevent the transfer of dangerous weapons and sensitive dual-use technology like communications satellites; (2) an effective defense for the United States against nuclear missile attack; and (3) a realistic arms control strategy toward China. Unless the Administration readjusts its priorities in its dealings with China—and places the proper weight on national security issues—the risks to security from continued commercial space cooperation with China will remain too high.

WHY COMMERCIAL SPACE COOPERATION IS UNDER SCRUTINY

Following a series of reports that China gained military and technical know-how from its space launches of commercial satellites for U.S. corporations, the House of Representatives voted

overwhelmingly (364 to 54) on May 20, 1998, to bar future satellite exports to China. This marked Congress's strongest action to date on the controversial issue of commercial space cooperation with China. Satellite exports to China—for launch or for sale—required presidential waivers from the sanctions imposed after the 1989 Tiananmen massacre. Since 1991, 11 waivers allowing the export of satellites to China for launches were issued by Presidents George Bush (3) and Bill Clinton (8). Indeed, China has launched 20 U.S.-made satellites for the United States, itself, and others.

The presidential waivers allow American companies to benefit from China's cheaper space launch prices, ranging from \$12 million to \$70 million per launch,² compared with U.S. launch prices that range from \$50 million to over \$100 million. Since 1989, the United States and China have regulated the price and number of annual Chinese commercial launches of U.S. satellites to protect the U.S. space launch industry. In 1995, for example, the United States agreed to allow China to price launches within 15 percent of U.S. costs, and to limit its number of launches to 15 by 2001.³

According to Merrill Lynch, U.S. commercial satellite revenues will grow from \$38 billion in 1997 to \$171 billion by 2007.⁴ Access to China's cheaper space launch vehicles (SLVs) could become more desirable, and a key element of future U.S. commercial space endeavors. The Motorola Corporation, for example, already plans to use Chinese SLVs to launch up to 18 satellites, following 6 it has launched already, to complete and maintain a 66-satellite global cellular voice

1. Samuel R. Berger, "Launching Satellites in China Is Good for the U.S.," *The Wall Street Journal*, June 3, 1998, p. A18.
2. Brian Harvey, *The Chinese Space Program* (Chichester, U.K.: Praxis, 1998), p. 80.
3. The agreement allows China, Russia, and Ukraine 15 to 20 launches of U.S. satellites each, up to 2001. For China, this number can increase to 17 if the average annual number of worldwide commercial launches exceeds 20. This agreement succeeded a 1989 agreement to allow 11 U.S. satellite launches on Chinese rockets from 1988 to 1994. In May 1997, however, a dispute over whether China had underpriced the launch of a Philippine satellite caused the United States Trade Representative to complain, and led to hints that the United States would not approve Chinese requests to increase the launch quota. See Warren Ferster, "U.S. Says China Violated Accord," *Space News*, May 19–25, 1997, p. 1.
4. Frank Sietzen and Simon Mansfield, "Report Predicts Satellite Revenues of \$171 Billion," *Spacecast Website* at <http://www.spacecast.com/spacecast/news/future-98i.html>, May 26, 1998.



and data constellation known as Iridium.⁵ By the end of 2006, China will launch 10 satellites for the Hughes Space and Communications Company's Globalstar system, a 56-satellite network that is set to compete with the Iridium.⁶ The Teledesic Company also intends to use Chinese launch services to loft part of its planned 288-satellite communications network.

The growth in commercial demand for Chinese launch services has coincided with the Clinton Administration's easing of export controls covering U.S. satellites. President Bush gave the U.S. Department of State the lead on issuing satellite export licenses. But President Clinton transferred the primary licensing authority for satellite exports to the Department of Commerce, an agency with commercial—*not* security—priorities. Following an intense bureaucratic struggle, in March 1996 President Clinton overrode the Department of State's October 1995 decision to retain its authority to review waivers.⁷

Because the Department of Commerce is charged with promoting U.S. economic interests, President Clinton's decision to give it primary licensing authority for satellite launches—a decision that was not announced until November 1996—demonstrated the willingness to place more emphasis on economic relations with China than security concerns. As a U.S. General Accounting Office (GAO) official testified, “[The

Department of] Defense's authority to influence the decision making process has diminished since the transfer.”⁸ The Clinton Administration claimed that the decision to switch licensing authority to the Department of Commerce reflected “agreement among State, Defense, and Commerce.”⁹ Former Secretary of State Warren Christopher reportedly opposed the shift in jurisdiction, however.¹⁰

The Clinton Administration also has claimed that its decision “did not relax our controls over the export of satellites, nor did it allow the transfer of sensitive technology.”¹¹ Yet the 1991 Arms Export Control Act requires sanctions against companies that sell dangerous missiles in violation of the 1989 Missile Technology Control Regime (MTCR). The MTCR prohibits the sale of missiles with a range of over 180 miles. At least since 1994, the Department of Commerce has argued that satellites do not fall under the definition of “missile-related” technology, as defined by the MTCR.¹² The Administration's decision to side with the Department of Commerce's definition of missile-related technology will weaken further the effect of the U.S. sanctions.

SECURITY IMPLICATIONS AND CONCERNS

The prospect of increased space launch and satellite commerce with China and the controversy over satellite export control may have caused the

5. This may allow Motorola to launch up to six Iridium satellites a year for a period of three years. See “China Gears Up for More Iridiums,” *Flight International*, May 13–19, 1998, p. 33; and Bruce A. Smith and Joseph C. Anselmo, “Operational Iridium Constellation in Place,” *Aviation Week and Space Technology*, May 25, 1998, p. 24.
6. “China to Launch 10 Satellites for Hughes Through 2006,” *Xinhua*, June 21, 1997.
7. Jeff Gerth and David E. Sanger, “How Chinese Won Rights to Launch Satellites for U.S.,” *The New York Times*, May 17, 1998, p. A1.
8. “Issues Related to Commercial Communications Satellites,” Testimony of Katherine V. Schinasi, Associate Director, Defense Acquisition Issues, National Security and International Affairs Division, U.S. General Accounting Office, before the Select Committee on Intelligence, U.S. Senate, 105th Cong., 2nd Sess., June 10, 1998, p. 14.
9. James E. Kennedy, special adviser to the White House Counsel, “Clinton's China Defense,” *The Washington Post*, June 1, 1998, p. A17.
10. Gerth and Sanger, “How Chinese Won Rights to Launch Satellites for U.S.”
11. Berger, “Launching Satellites in China Is Good.”
12. Bill Gertz, “Clinton Rescinded Bush's Policy on Exports,” *The Washington Times*, June 15, 1998, p. A15.



Clinton Administration to ignore simmering concerns over security. More satellite launches from China, however, will increase the number of opportunities that important technology could be transferred to China's missile program. The overwhelming vote in the House of Representatives to halt commercial satellite cooperation reflects bipartisan frustration with the Administration over key security issues, such as: (1) the possible leakage of U.S. missile technology or know-how to China; (2) perceived lax policies toward export controls of products to China; (3) possible influence over satellite export decisions by campaign donors; and (4) allegations that Chinese aerospace executives—perhaps in collusion with China's highest leaders—sought to purchase political influence.¹³

In the near future, Congress will investigate these deeply intertwined issues. Representative Christopher Cox (R-CA) will direct a select committee in the House; in the Senate, investigations will take place in the Intelligence Committee chaired by Senator Richard Shelby (R-AL) and in the Government Affairs Committee under Senator Fred Thompson (R-TN). The Senate Foreign Relations and House National Security and International Relations Committees will hold hearings as well.

China's Access to U.S. Technology

The most important security issue for Congress to consider is whether U.S. missile technology or know-how has been transferred to China's military

program through commercial space cooperation. Evidence that this may have occurred, for example, is an exchange of information between a committee led by Space Systems/Loral and Hughes Electronics officials and the Chinese involved with the launch of a commercial satellite in 1996. The committee issued a report assessing the Chinese analysis of the failure of its Long March rocket in February 1996, which discussed "[r]ocket guidance and control systems."¹⁴ Loral officials immediately admitted this information had gone to the Chinese. The Department of State later charged that this transfer of information violated U.S. arms control laws. In May 1997, the Defense Technology Security Administration (DTSA) of the Department of Defense is reported to have approved an Air Force intelligence finding that the Loral crash review indeed had passed technology that could have helped China to improve its guidance systems for its ballistic missiles.¹⁵ The conclusion of the DTSA report, that "United States national security has been harmed,"¹⁶ provoked an ongoing investigation by the U.S. Department of Justice. Space Systems/Loral officials have said that "No 'secret' or 'classified' information was ever discussed with the Chinese or included in any reports provided to the Chinese."¹⁷ And U.S. defense officials explained that, when a U.S. satellite goes to China for launch, every aspect of its delivery and launch is monitored by officials at the Department of Defense and other agencies to ensure that Chinese technicians do not tamper with it.¹⁸ There is not sufficient public information available to

13. For reporting and analysis on the interrelationship between satellite export licensing and Chinese influence, see Jeff Gerth, "U.S. Business Role in Policy on China Is Under Question," *The New York Times*, April 13, 1998, p. A1. See also Jeff Gerth and John M. Broder, "Papers Show White House Staff Favored a China Satellite Permit," *The New York Times*, May 23, 1998, p. A1; Jeff Gerth, David Johnston, and Don Van Natta, "Democrat Fund-Raiser Said to Detail China Tie," *The New York Times*, May 15, 1998, p. A1; Jeff Gerth and David E. Sanger, "How Chinese Won Rights to Launch Satellites for U.S.," *The New York Times*, May 17, 1998, p. A1; editorial, "China, Missiles and Clinton," *The Wall Street Journal*, May 22, 1998, p. A16; editorial, "Quid Pro Quo? A China Chronology," *The Washington Times*, May 22, 1998, p. A-22; and Bill Gertz, "Chinese Delivery," *National Review*, June 1, 1998.

14. Gerth, "U.S. Business Role in Policy on China," p. A1.

15. Roberto Suro and John Mintz, "Bungled Report, Bureaucracy Collide in China Waiver," *The Washington Post*, May 31, 1998, p. A16.

16. Gerth, "U.S. Business Role in Policy on China," p. A8.

17. Space Systems/Loral, "China Issues," Fact Sheet, May 18, 1988.



judge, however, whether the United States has been successful in this endeavor.

Nonproliferation experts, such as Henry Sokolski, executive director of the Nonproliferation Policy Education Center in Washington, D.C., have noted that U.S. know-how often is transferred indirectly when American companies validate Chinese improvements to their launchers to increase reliability and capability.¹⁹ To validate China's missile system improvements, American companies essentially tell the Chinese whether their improvements or modifications will work. They may not provide direct information, but the information they provide could help the Chinese confirm that their technical solutions conform to U.S. knowledge or experience. American companies are inclined to help Chinese launch efforts in this manner in order to reduce the launch failures of the Long March rockets and to ensure the completion of their contracts.

Sokolski has stated that, coinciding with the launching of U.S. satellites, China has mastered technical problems that could improve its military missile capabilities. These improvements include:

- **System integration.** In the 1990 launch of its Hughes AsiaSat I satellite, the Chinese learned how to build clean rooms that allow for satellite launch integration. This knowledge could enable the Chinese to launch more sophisticated military satellites.
- **Use of post-boost vehicles.** During the 1995 launch of the Martin Marietta AsiaSat II, China perfected a new solid-fuel kick-motor to place satellites in the proper orbit. This technology is similar to a post-boost vehicle that could be

used to give nuclear warheads a new flight path after launch. A better post-boost vehicle also could make the warheads of China's intercontinental ballistic missiles (ICBMs) more difficult to intercept.

- **Smart-dispenser, multiple warhead technology.** In 1997 and 1998, Motorola used a Chinese-made "smart dispenser" to place two Iridium satellites in orbit per launch. Although China has had the ability to launch multiple satellites since 1981,²⁰ the new dispenser for the Motorola satellites is much more sophisticated than the version China used in 1981. Its technology is similar to that used in multiple independently targetable re-entry vehicle (MIRV) missile warhead dispensers. U.S. Air Force General Eugene Habinger recently disclosed that China is trying to develop multiple warhead-capable missiles.²¹ Multiple warheads could be used to attack possible targets in the United States and elsewhere and defeat missile defenses.

Increased Threat to National Security

A more general concern about the military implications of commercial space launch cooperation with China derives from the basic similarity between ICBMs and SLVs. Historically, early U.S. and Soviet ICBMs were used for SLVs; and India's SLV program assists its long-range missile efforts today. Significantly, both ICBMs and SLVs contain interchangeable elements, including engines, structure, staging, guidance systems, system integration, and payload deployment.²² Chart 1 illustrates the near-equivalence of China's DF-5A ICBM and the Long March LM-2C satellite

18. Conclusion based on conversations with U.S. officials involved in this process.

19. Henry Sokolski, "U.S. Satellites to China: Unseen Proliferation Concerns," *International Defense Review*, April 1994, pp. 23–26; Space Technology Transfers and Missile Proliferation, Testimony before the Commission on the Ballistic Missile Threat, April 10, 1998; "Beyond The Loral-Hughes Controversy: A Decade of U.S. Satellite Transfers and Their Military Significance," Presented before a Seminar of the Council for the Defense of Freedom, May 18, 1998.

20. In September 1981, a Chinese FB-1 launcher, which is based on the DF-5 ICBM, launched three satellites. This is viewed as an indication that China at that time was working on a multiple-warhead capability for its missiles.

21. Bill Gertz, "China's Nukes Could Reach Most of U.S.; Russians Also Beefing Up Missiles, Top General Says," *The Washington Times*, April 1, 1998, p. A1.



B 1198

Chinese Civil and Military Missiles

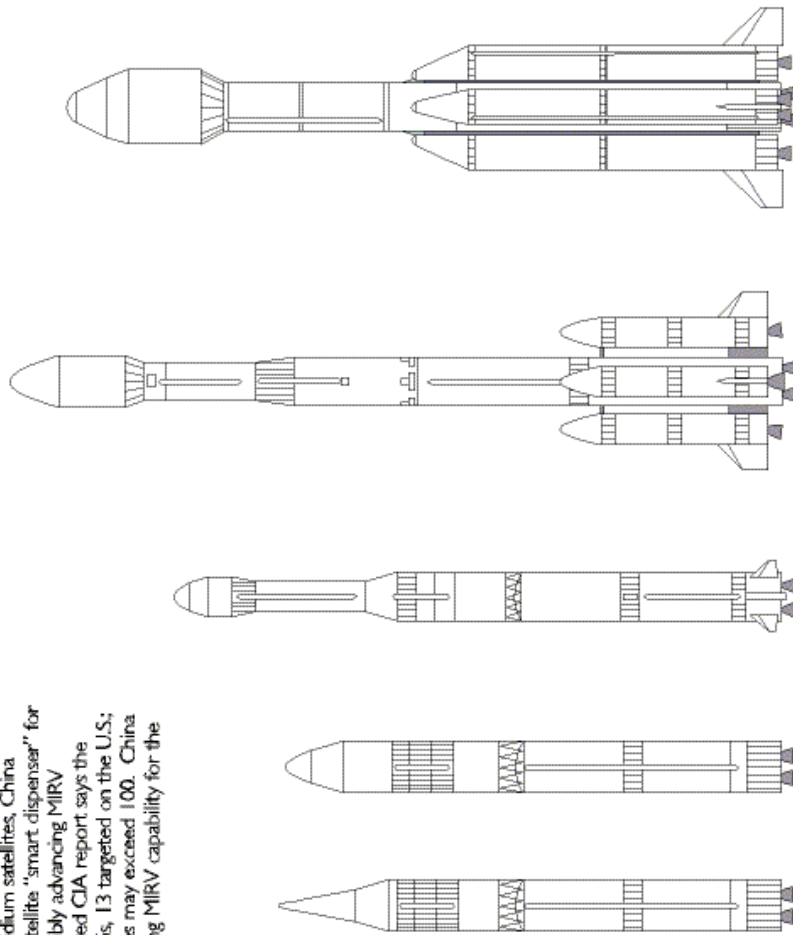
Long March Space Launch Vehicles Derived from DF-5 ICBM

DF-5A = LM-2C

For Motorola's Iridium satellites, China developed a 2-satellite "smart dispenser" for the LM 2C, possibly advancing MIRV capability. A leaked CIA report says the PLA has 18 DF-5s, 13 targeted on the U.S.; plausible estimates may exceed 100. China may be developing MIRV capability for the DF 5.

Future PLA ICBMs

Both the DF-31 and the DF-41 are in development, for estimated deployment in the next decade. Both will be solid-fueled, and may be mobile and MIRV-capable. While both are indigenous programs, Russian missile and TEL technology may be used.



MAZ TEL***

Transporter/Erector/Launcher

Function	DF-5A	LM-2C	LM-3B	LM-2E (Improved)**	DF-31**	DF-41**
Diameter	3.35m	3.35m	3.35m	?	?	?
Length	36m (est)	35.14m	53m	?	?	?
Payload	?	?	4,800kg	8,800kg	MIRV?	MIRV
Range	13,000km	X	X	X	8,000km	12,000km
Year Operational	1986	1986	1995	2000?	2000?	2005+?
	(DF-5, 1981)					

Notes: * LM-2E could be used for manned spaceflight. ** Notional configuration. *** At least one MAZ TEL has been purchased from Belarus.



launcher. In fact, 11 of the liquid-fueled Long March series of launchers are derived from the DF-5 ICBM.

Although National Security Adviser Berger has written that “The satellites exported to China for launch are not used for military purposes, nor do they result in the transfer of missile technology,”²³ the recent DTSA report indicates that some U.S. know-how more than likely was transferred during the commercial space launches. This know-how could help China to improve its existing strategic missile force. Conventional defense policy accepts that, for nearly two decades, China probably has had a small nuclear missile force designed for retaliation or deterrence.²⁴ A recently leaked U.S. Central Intelligence Agency report notes that China already has 18 8,000-mile-range DF-5 ICBMs that can reach the United States today, and about 25 2,850-mile-range DF-4 medium-range ballistic missiles.²⁵ Some Chinese military analysts note that even some transference of U.S. know-how from commercial endeavors may not increase the gravity of the threat already facing the United States from these existing missiles.²⁶

Congress should question the confidence that the Clinton Administration and the defense intelligence community place on their own assessments of China’s current missile force. Some reports that appeared in 1996 suggest the United States may be

underestimating China’s missile force. For example, during the 30th anniversary celebration of China’s Second Artillery (its specialized missile force) in 1996, China’s military press reported the completion of a decade-long project to build what is speculated to be a large missile base inside a mountain range.²⁷ A curious report that also appeared in 1996 estimates that China may have over 120 to 150 DF-5 missiles, which could be modified to carry as many as six one-megaton nuclear warheads.²⁸ If China is concealing ICBMs in a mountain base, then even marginal improvements to its ICBMs derived from U.S. technical know-how would contribute to a greater potential missile threat.

Possible U.S. Business Subsidies to China’s Military Missile Program

In addition to the possibility of missile and dual-use technology leakage, U.S. commercial use of Chinese SLV services may provide direct or indirect subsidies of People’s Liberation Army (PLA) missiles. How? In China, the PLA controls the design, production, marketing, and launching of both civilian and military space launch vehicles. For example, the Commission of Science, Technology, and Industry for National Defense controls commercial space launches and (under China’s State Council and the Central Military Commission [CMC] of the Chinese Communist Party

22. William R. Graham, Ph.D., Testimony before the Senate Committee on Governmental Affairs, Subcommittee on International Security, Proliferation, and Federal Services, on “Benefits of Commercial Space Launch Assistance and Use For Foreign Intercontinental Ballistic Missile Programs,” 105th Cong., 2nd Sess., May 21, 1998.

23. Berger, “Launching Satellites in China Is Good for the U.S.”

24. China has declared on many occasions that it will not be the first to use nuclear weapons.

25. Bill Gertz, “China Targets Nukes at U.S.,” *The Washington Times*, May 1, 1998, p. A1.

26. Opinion of Bates Gill, Monterey Institute of International Studies, quoted in Bradley Graham, “Chinese Missile Gain Questioned,” *The Washington Post*, May 31, 1998, p. A16. See also “Missile and Space Launch Vehicle Technology and Export Controls,” Prepared Testimony of John Pike, Director, Space Policy Project, Federation of American Scientists, before the Senate Government Affairs Committee, International Security, Proliferation and Federal Services Subcommittee, 105th Cong., 2nd Sess., May 20, 1998, p. 3.

27. See “Development of the Second Artillery Corp.,” *Xinhua*, July 7, 1996, in *FBIS-CHI-96-173*. U.S. officials have not confirmed publicly the existence of such a base.

28. Yang Zheng, “China’s Nuclear Arsenal,” at <http://www.bme.med.ualverta.ca/~fwang/nuc-ch>, October 10, 1996. The real name and credentials of this analyst are not known. This analysis far exceeds conventional estimates for China’s nuclear and missile forces, but one U.S. government expert told this author that its estimates are plausible.



Politburo²⁹) the research, development, production, and acquisition of high-technology weapons. It has an important military intelligence-gathering function and it pays special attention to ensure that gains in civilian technology benefit military programs.³⁰ It also runs China's three space launch facilities for both commercial and military missions.

Development and production of space launch vehicles are carried out by the First Academy of the China Aerospace Corporation, which also develops and produces China's ICBMs, medium- and short-range ballistic missiles, cruise missiles, and satellites. The corporation's marketing arm, the China Great Wall Industries Corporation, negotiates contracts and interacts with foreign companies that are interested in using China's SLV services. The China Great Wall Industries Corporation has been accused of being a conduit of funds between China and the U.S. Democratic National Committee.³¹ It also has been involved in the sale of 180-mile-range M-11 missiles to Pakistan. Because of the sale of this missile in 1993, both the China Aerospace Corporation and the China Great Wall Industries Corporation were subject to U.S. sanctions.

Another concern is that revenue from U.S. use of Chinese space launch services could go to China's missile-producing organizations. Based on

an average launch price of about \$40 million,³² China could gain about \$1.56 billion in revenue from its U.S. satellite launches, including future Iridium and Globalstar satellite launches.³³ One government source who wishes to remain unnamed explained to this author that revenues from space launches are divided between the Commission of Science, Technology, and Industry for National Defense (which receives 45 percent), the China Aerospace Corporation (45 percent), and the China Great Wall Industries Corporation. The intertwined nature of China's civilian and military missile and space programs indicates that at least some of the profits from U.S. commercial satellite launches could be subsidizing China's missile development programs, including the improvement of its ICBMs.

Possible PLA Use of U.S.-Made Communication Satellites

According to a recent news report, U.S. intelligence sources have known for two years that the PLA has been using U.S.-made satellites, despite sanctions that have banned the sale of military equipment to China since 1989.³⁴ The PLA could have additional access to U.S. satellites through the Asia Pacific Telecommunications Company, which partners China's Commission of Science, Technology, and Industry for National Defense, the Ministry of Posts and Telecommunications, and

29. The CMC is the most powerful subcommittee of the Politburo, and includes Party Chairman and President Jiang Zemin, CMC Vice Chairman and Defense Minister Chi Haotian, and CMC Vice Chairman and PLA Chief of Staff General Jiang Wianan.

30. For more on the role of this agency, see Shirley A. Kan, "China: Commission of Science, Technology, and Industry for National Defense and Defense Industries," *CRS Report for Congress*, No. 96-889-F, updated December 3, 1997.

31. An executive of China Great Wall Industry Corporation, PLA Lieutenant Colonel Liu Chao-ying, reportedly gave \$300,000 to fundraiser Johnny Chung, who then gave \$100,000 to the Democratic National Committee. Liu is the daughter of General Liu Huaqing, who retired last year as Principal Vice Chairman of the CMC. Liu Huaqing was a leading architect of China's military modernization program for more than a decade. The CAC has denied any wrongdoing, and China's government has denied that it was seeking to buy influence. See Gerth, "Democrat Fund-Raiser"; John Diamond, "Chinese Admit Democrats Got Funds," *Associated Press*, May 18, 1998; and Steven Mufson, "Chinese Firm Denies It Got Sensitive Technology from U.S.," *The Washington Post*, May 23, 1998, p. A16.

32. Derived from the range of launch prices in Harvey, *The Chinese Space Program*, p. 80.

33. The average of \$40 million derived from prices in Harvey, *The Chinese Space Program* (p. 80), multiplied by a projected 39 launches of U.S. satellites.

34. Jeff Gerth, "Reports Show Chinese Military Used American-Made Satellites," *The New York Times*, June 13, 1998, p. A1.



the China Aerospace Corporation with companies in Hong Kong and Thailand.³⁵ Its Apstar satellite network uses two Hughes HS 376 communications satellites and one Space Systems/Loral FS-1300 communications satellite.³⁶ The presence of the Commission of Science, Technology, and Industry for National Defense in this partnership indicates that the PLA, at a minimum, has the ability to make use of these satellites for military missions.

It also has been reported that a Lockheed-Martin Chinastar communications satellite launched from China on May 30, 1998, will be operated by the China Orient Telecom Satellite Company. This company has been linked to the Commission of Science, Technology, and Industry for National Defense. The report notes that Chinastar will be used "for military communications and [for] supporting PLA business interests."³⁷ Further, China is using the German company Teledix help to build a better communication satellite, the domestic Sinosat-1.

The case of Hughes Space and Communication's employment of satellite project manager Shen Jun illustrates the difficulty of protecting U.S. satellite technology from use by the PLA. Shen, a dual Chinese-Canadian citizen, is the son of General Shen Rongjun, vice chairman of the Commission of Science, Technology, and Industry for National Defense. General Shen also ran China's military satellite programs.³⁸ Federal investigators are examining whether the younger Shen provided information in 1995 and 1996 that could have

helped China's military satellite program.³⁹ Hughes officials have indicated that Shen probably would not have access to information of interest to China's military.⁴⁰

Since the Persian Gulf War, the PLA has sought to develop a survivable "C⁴I" (command, control, communication, computers, and intelligence) network to gather and distribute intelligence and issue commands. By one estimate, China's government devotes 20 percent of the country's telecommunications budget to efforts to build better communications capabilities for the PLA.⁴¹ With an effective communications satellite network, the PLA would be able to use real-time data to coordinate operations combining missile, air, and naval forces. This is critical in modern warfare, and a current PLA weakness. China also is developing a direct-broadcast satellite, the DFH-4, which will have the ability to transmit military information directly to small units equipped with mobile satellite transceivers. Before this satellite is ready in a few years, the PLA may use foreign satellites owned by firms in which the Commission of Science, Technology, and Industry for National Defense and the China Aerospace Corporation have a financial stake.

Some people have countered these concerns by claiming that China's military use of U.S.-made communications satellites gives the United States intelligence on China's military activities because it will be easier for the United States to intercept signals.⁴² But this claim assumes that the United States can decipher China's code encryption and

35. "Company Plans Asian Satellite," *Space News*, June 1-7, 1992.

36. Launch dates: Apstar 1 (Hughes HS 376), July 21, 1994; Apstar 2 (HS 601), launched but destroyed on January 25, 1995; Apstar 1A (HS 376), July 3, 1996; Apstar 2R (Lockheed-Martin FS-1300), October 16, 1997.

37. Craig Covault, "Chinese Army May Use Next U.S. Satellite," *Aviation Week and Space Technology*, June 1, 1998, p. 22.

38. Jeff Gerth, "U.S. Rethinking a Satellite Deal Over Links to Chinese Military," *The New York Times*, June 18, 1998, p. A1.

39. John Diamond, "U.S. Scientist's Tie to China Probed," Associated Press, June 18, 1998.

40. *Ibid.*

41. "Fiber Optic Communications Technology," *Zhongguo Dianzi Bao*, December 1, 1995, p. 3, in *FBIS-CST-96-005*, and Liu Dongsheng, "Telecommunications: Greater Sensitivity Achieved," *Jeifangjun Bao*, September 8, 1997, p. 5, in *FBIS-CHI-287*.

42. Walter Pincus, "U.S. Gains Intelligence Data in Chinese Launches," *The Washington Post*, June 13, 1998, p. A18.



carries the potential price of helping China to build a better and more secure communications network that is essential for modern military operations.

Potential Danger to U.S. Satellite Operations.

Some Members of Congress are concerned that China may have gained knowledge of U.S. encrypted codes for satellite control signals that could allow China to interfere with U.S. satellites. The encrypted code information reportedly may have been obtained from the wreckage of a Loral FS-1300 communications satellite destroyed in the failed launch of a Long March SLV in February 1996. The coded information was on a circuit board in the command processor box that allows ground controllers to change the attitude of the satellite. The box survived the crash. China, however, blocked U.S. officials from the crash site for five hours. When U.S. officials were allowed to investigate the wreckage, they found that the critical circuit board was missing from the control processor box.⁴³ According to a *New York Times* report, a "senior Defense Department official" stated "we have to assume they [the Chinese] do have it."⁴⁴ The encrypted code information in the circuit board, if successfully reverse-engineered by the Chinese, could provide information on U.S. communication security methods. It also raises the possibility that China potentially could interfere with U.S. satellites. Representative Curt Weldon (R-PA) was told by the National Security Agency (NSA), which protects U.S. encryption systems, that it "adopted new space encryption algorithms" following the 1996 satellite loss. This would make U.S. communication with satellites more secure. But on Jun 24, the NSA reversed its previous statement to Weldon, saying that encryption changes

following the 1996 satellite loss were "unrelated" to that incident.⁴⁵

Future Chinese Missile and Military Space Ambitions

The United States should examine China's missile modernization and space development plans to better ascertain its future ambitions. China currently is developing three new ICBMs—the 5,000-mile-range DF-31; its submarine-borne counterpart, the JL-2; and the 7,200-mile-range DF-41. These missiles are expected to be solid-fueled, contain multiple warheads, and be mobile. Better post-boost launch vehicles and multiple-warhead technology are critical to the effectiveness of these missiles. China also is building better medium- and short-range ballistic missiles as well as a new class of long-range land-attack cruise missile similar to the U.S. Tomahawk. Finally, it is interested in antimissile, antisatellite, and military laser technology.

Overall, China has demonstrated it has ambitious plans for military and civilian use of space. It may seek Russian and Western assistance to build its radar satellites,⁴⁶ which, unlike regular imaging satellites that are limited by cloud cover, can be used to follow U.S. naval forces in Asia in all weather conditions. This capability could be used to target U.S. forces with new ballistic and cruise missiles or attack aircraft. China is developing an improved imaging satellite and, like the United States, can be expected to use commercial imaging satellites for military purposes. Furthermore, to coincide with the 50th anniversary of the founding of the People's Republic of China in 1999, China is expected to launch its first manned space mission.⁴⁷ This program is receiving extensive

43. Robert S. Greenberger, "U.S. Faces Probe of Role in Aiding China in Analyzing 1995 Rocket-Launch Crash," *The Wall Street Journal*, June 24, 1998, p. A8.

44. Eric Schmitt, "Coded U.S. Device Missing in Wreck of Chinese Rocket," *The New York Times*, June 24, 1998, p. A22.

45. Eric Schmitt, "White House Plays Down Loss in China in '96," *The New York Times*, June 25, 1998, p. A15.

46. For more information on China's use of foreign military technology to assist its military modernization, see Richard D. Fisher, Jr., "How America's Friends Are Building China's Military Power," Heritage Foundation *Background* No. 1146, November 5, 1997.

47. Tim Furniss, "Orbital Aspirations," *Flight International*, April 22-28, 1998, p. 60.



assistance from Russia, and the Chinese space capsule is expected to resemble Soyuz, the principal Russian space capsule. China also is considering space stations, moon exploration, and space shuttles.⁴⁸ Like the United States, China can be expected to adapt the lessons and technology it learns from these civilian space programs to military use to meet its security goals.

China's Lack of Commitment to Arms Control

The Clinton Administration reportedly has proposed that, if China joined an agreement to limit missile technology exports, greater civilian space cooperation with the United States would follow.⁴⁹ For the Sino-U.S. summit this month, the Administration reportedly offered China a space cooperation agreement entailing scientific cooperation in the areas of earth observation, atmospheric science, sensors, and scientific exchange programs. The U.S. National Aeronautics and Space Administration and China's Space Administration and State Science and Technology Commission would monitor the agreement and "exchange scientific data freely and without restriction."⁵⁰ The Clinton Administration also may consider allowing China to join the International Space Station project.⁵¹ These offers would be contingent on China's agreeing to halt its sale of missiles and missile technology to rogue states by joining the MTCR. China, however, consistently has refused to join this regime. There is no indication that China has been

impressed by previous U.S. attempts to link arms control to civilian space cooperation. During a meeting to prepare for the June summit, Chinese officials reportedly told Secretary of State Madeleine Albright that China was not ready to join the MTCR.⁵²

The MTCR historical record with China is complex. In January 1992, after President Bush imposed sanctions on China for selling 180-mile-range M-11 missiles to Pakistan, China told the Bush Administration it would adhere to the restrictions of the MTCR (but not join). President Bush responded by issuing waivers to allow China to launch five satellites. Then, in apparent retaliation for the U.S. sale of F-16s to Taiwan in 1992, China sold more M-11s to Pakistan. This prompted the Clinton Administration, in August 1993, to levy sanctions on 11 Chinese aerospace entities, including the China Great Wall Industries Corporation, an agent for the sale of M-11s to Pakistan.

By January 1994, following heavy lobbying by U.S. satellite makers, the Clinton Administration had exempted commercial communications satellites from the sanctions. And it ended the 1993 sanctions after China promised, again, in October 1994 to abide by the MTCR. Since then, China is believed to have supplied Pakistan with the parts needed to build a missile in the class of 360-mile-range DF-15.⁵³ China also reportedly sold technology to enable Iran to build ballistic missiles.⁵⁴ In March 1998, White House National Security

48. Phillip Clark, "Chinese Designs on the Race for Space," *Jane's Intelligence Review*, April 1997, pp. 180, 182; and Chapter 7 of Harvey, *The Chinese Space Program*.

49. Bill Gertz, "Space Deal May Enhance China's Missile Program," *The Washington Times*, April 29, 1998, p. A1.

50. *Ibid.*

51. Frank Sietzen and Simon Mansfield, "Clinton May Propose China Aboard Station," *Spacecast* Web site at <http://www.spacer.com/spacecast/news/iss-98d.html>, May 26, 1998.

52. Jim Mann, "China Rejects Joining Missile-Control Group, U.S. Officials Say," *The Los Angeles Times*, April 17, 1998, p. A8.

53. The Pakistani Haft-3 is reported to be based on DF-15 missile technology. See Andrew R. Koch and W. P. S. Sidhu, "South Asia Goes Ballistic, Then Nuclear," *Jane's Intelligence Review*, June, 1998, p. 37; and Joseph Bermudez, "A Silent Partner," *Jane's Defence Weekly*, May 20, 1998, p. 16.

54. Bill Gertz, "China Sold Iran Missile Technology," *The Washington Times*, November 21, 1996, p. A14; "China Joins Forces with Iran on Short-Range Missile," *The Washington Times*, June 17, 1997, p. A3; and "Russia, China Aid Iran's Missile Program," *The Washington Times*, September 10, 1997, p. A1.



Council arms control adviser Gary Samore is reported to have argued in a memo, as a reason to help persuade China to sign the MTCR, that doing so would offer China “substantial protection from future U.S. missile sanctions.”⁵⁵ It is not known whether Samore’s opinion is completely shared by the Clinton Administration, but it represents an inclination to use only carrots and avoid using any sticks regarding arms control and China.

China joined the Nuclear Non-Proliferation Treaty (NPT) in 1992. The NPT seeks to control the spread of nuclear technology to non-nuclear states. China assisted Pakistan’s nuclear program since the 1970s, however, after India’s first nuclear test in 1974. This technical assistance proved critical in Pakistan’s testing of six nuclear devices between May 28 and 30, 1998. China also may have sold Iran nuclear technology that is applicable to its nuclear weapons program, although Iran’s financial difficulties may have impeded such sales. Clearly, China appears less willing to abide by the NPT than the Clinton Administration has suggested.

STRATEGIC POLICIES FOR GREATER SECURITY

President Clinton hopes to advance in Beijing what his Administration calls a “strategic partnership,” but he may find China’s leaders resistant to U.S. demands that China control the building or trafficking of nuclear missiles and nuclear weapons technology. As the issues surrounding the possible transfer of missile technology to China are investigated, clearly, close attention should go to China’s missile and space plans, as well as to those of the Clinton Administration to pursue arms control with China. Congress should encourage the Administration to bring to the table clear policies that promote strategic deterrence and responsible Chinese behavior. Without a clear strategy that places emphasis on national security concerns

over commercial space cooperation, the Clinton Administration may find a strategic partnership difficult to sustain.

In the past, the Clinton Administration’s policy of engagement has proved unsuccessful in crafting a true strategic partnership with China, with both sides seeking the same goals. In fact, President Clinton’s lofty rhetoric cannot disguise the fact that the risks of future confrontation with China have increased. China used missiles to intimidate Taiwan in 1995 and 1996, and its future missile forces are being tailored for possible military operations over Taiwan.⁵⁶ The recent nuclear tests in Pakistan and India, and the ensuing nuclear missile race between these hostile neighboring countries, is partially the result of China’s support of Pakistan’s missile and nuclear ambitions, which the Clinton Administration was unable to stop. As a result, China now may be forced to increase its own missile forces, creating new dangers for U.S. interests in the Middle East and Asia.

In light of these developments, the United States has an immediate need to engage China in effective arms control initiatives. Although U.S. commercial interests can be advanced by participating in China’s current and future space program, it is in the interest of neither the United States nor its allies for China to build a larger, more effective nuclear missile arsenal. The United States should link commercial space cooperation with China with its acceptance of globally accepted nonproliferation behavior. Any approach that results in rewards for China’s aggressive nuclear and missile behavior will undermine the leverage the Clinton Administration has with China, diminish U.S. influence globally, and threaten U.S. security.

The Clinton Administration and Congress should seek a new strategy that includes such strong national security policies as:

55. Bill Gertz, “U.S. May Help China on Missiles; But Beijing Must Halt Tech Exports,” *The Washington Times*, March 18, 1998, p. A1.

56. See Richard D. Fisher, Jr., “China’s Arms Require Better U.S. Military Ties with Taiwan,” Heritage Foundation *Backgrounder* No. 1163, March 11, 1998, pp. 6–7.



- **Suspending U.S. satellite exports to China pending the outcome of congressional investigations.** The May 20 vote in the House of Representatives to suspend satellite exports to China was the correct response to the reports that cooperative commercial endeavors may have helped transfer important U.S. missile technology to China. Regardless of the outcome of the investigations, the United States should send a strong message to China that it is deeply concerned. The commercial interests of U.S. aerospace companies (as well as China's apparent ability to exploit the U.S. campaign finance system and the use of presidential waivers) should not weaken U.S. resolve to defend U.S. national security interests.
- **Rebuilding U.S. technology export controls.** The possibility that China obtained U.S. technical missile know-how and the growing demand in China for military missile and space technology are indications that the United States should revise its technology export control regime. The Clinton Administration weakened controls over militarily useful technology after the end of the Cold War. It also presided over the dismantling of the Coordinating Committee for Multilateral Export Controls (COCOM), which successfully denied the Soviet Union access to a great deal of Western military technology and sensitive commercial dual-use technology with military applications. And, in 1996, it transferred leading authority over satellite exports from the Department of State to the Department of Commerce. A Cabinet department charged with promoting trade and commercial interests is not an appropriate place for decision-making about defending national security interests. Each of these decisions should be reconsidered, and, at a minimum, the 1996 decision should be reversed.
- **Devising a new international export control organization,** considering China's uncertain nuclear and space intentions and the increased danger of nuclear missile proliferation. Such a body should focus on preventing U.S. companies, as well as those of its allies, from selling weapons and military technology to China and other states that could use such technology to threaten the United States and its allies.⁵⁷ The goal of such a body should be to rebuild international controls over military technology and militarily sensitive dual-use technology in a manner promoted by the now-lapsed COCOM.
- **Building an effective defense against nuclear missiles.** The nuclear and missile race between India and Pakistan and the increased possibility that China will expand its nuclear missile forces are factors that emphasize the U.S. need to have an effective defense against nuclear missiles. The Clinton Administration's refusal to abandon the self-defeating restrictions of the 1972 Anti-Ballistic Missile Treaty, which prevent adequate testing and deployment of missile defenses, amounts to unilateral disarmament in the face of escalating global threats. The Administration's missile defense efforts, which center on a small number of ICBM-derived, ground-based missile interceptors, are woefully inadequate. President Bush's 1991 proposal to combine space-based, anti-missile interceptors and lasers with ground-based antimissile systems laid the groundwork for the correct strategy. President Clinton's decision in 1993 to abandon this strategy was a strategic mistake. Had Bush's vision been fulfilled, countries like India, Pakistan, and China today would be less inclined to invest in missiles that the United States could shoot down. Conversely, the absence of an effective U.S. missile defense system contributes to the willingness of states to build nuclear missiles, and undermines national security.
- **Devising a realistic arms control strategy toward China.** The Clinton Administration's approach, stressing incentives over requiring responsible Chinese actions, only undermines

57. For more information, see Fisher, "How America's Friends Are Building China's Military Power."



China's respect for the United States and the prospects for achieving successful arms control. The United States should condemn China's nuclear assistance to Pakistan, and it should remind China that, in the 1980s, it was instrumental in preventing China's neighbors, South Korea and Taiwan, from building nuclear arms. If China has any hope of future commercial and civilian space cooperation, it must show its good intentions by signing and abiding by the MTCR. In addition, the United States should build effective missile defense and laser-based theater missile defense systems and deploy them in Asia to defend its allies.

China must make a choice: It can participate in a regime of nuclear system transparency and control for Asia and benefit from the potential sharing of U.S. nuclear missile defense technology; or it can build a new range of nuclear systems and spark an arms race among other countries to build nuclear defenses. China should realize that, by providing these states with a non-nuclear missile deterrent, their desire to develop nuclear weapons to deter China's nuclear missiles would be lessened. China's decision will determine the response of the United States.

CONCLUSION

Although the Clinton Administration has asserted that commercial space cooperation does not result in the transfer of missile technology, there is evidence that it does—and, in fact, that it has. In the face of serious bipartisan concern, Congress is right to investigate the serious issues surrounding the possible transfer of U.S. missile technology to China. Congress deserves to be told what has happened, and what the Administration plans to do about it. To assess the threat to national security more accurately, Congress should ask the Administration to present a detailed analysis of the current and future capabilities of China's nuclear missile force. Members of Congress have the opportunity to exercise sorely needed leadership in this critical security area. A strategic approach toward China that emphasizes security and deterrence and places the Clinton Administration's desire for commercial space cooperation in proper perspective is necessary. The Administration has lost sight of the country's most important concerns, and its misplaced priorities may have damaged the prospect for achieving arms control and peaceful relations with China in the future.

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