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China: Possible Missile Technology Transfers from U.S. Satellite Export Policy - Background and Chronology

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Abstract

Members of Congress are concerned about whether U.S. firms have provided technology or expertise to China for use in its ballistic missile program and whether a series of decisions by the Clinton Administration on satellite exports have facilitated legal or illegal transfers of missile-related technology to China. The *New York Times* reported in April 1998 that the Justice Department is conducting an ongoing criminal investigation into whether Loral Space and Communications (of New York), and Hughes Electronics (of Los Angeles) violated export control laws. The firms are alleged to have shared their findings with China on the cause of a Chinese rocket's explosion while launching a U.S.-origin satellite in February 1996. In sharing their conclusions, the companies are said to have provided expertise that China could use to improve its ballistic missiles, including their guidance systems. This CRS report provides detailed background information, significant Congressional action, and a comprehensive chronology. The events summarized here, based on various open sources and interviews, pertain to various aspects of U.S. foreign and security policy. This report may be updated if there are significant developments.

NOTE

This CRS study was initiated at the request of the Committee on International Relations of the House of Representatives and is adapted for general Congressional use with permission of the Committee.

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Summary

Congress is investigating whether U.S. firms have provided expertise to China for use in its ballistic missile and space programs and whether a series of decisions by the Clinton Administration on satellite exports have facilitated legal or illegal transfers of military-related technology to China. Critics are concerned that the Clinton Administration relaxed export controls and monitoring of commercial satellites in moving the licensing authority from the State Department to Commerce Department. The concerns were prompted by *New York Times* reports in April 1998 that the Justice Department is conducting an ongoing criminal investigation into whether Loral Space and Communications Ltd. and Hughes Electronics Corp. violated export control laws. The firms are alleged to have shared their findings with China on the cause of a Chinese rocket's explosion while launching a U.S.-origin satellite in February 1996. In sharing their conclusions, the companies are said to have provided expertise that China could use to improve the accuracy and reliability of its ballistic missiles, including their guidance systems. News report have cited at least three classified reports as saying that U.S. national security has been harmed. In addition, the press reports alleged that President Clinton in February 1998 issued a waiver for sanctions that undermined the investigation by allowing the issuance of licenses for the export of assistance similar to that in question. Moreover, the *Times* article alleged that political considerations may have influenced the Administration's decision, since Loral's chairman was the largest personal donor to the Democratic National Committee for the 1996 election.

Loral issued a statement on May 18, 1998, denying allegations that it provided missile guidance technology to China. Loral denied that it and Hughes conducted an independent investigation to determine the cause of that launch failure. However, the company acknowledged that it formed a committee to review the Chinese investigation and that, contrary to its policies, "the committee provided a report to the Chinese before consulting with State Department export licensing authorities." Administration officials say that export licensing procedures and strict security measures (including monitoring by the Department of Defense) preclude any assistance to the design, development, operation, maintenance, modification, or repair of any launch facility or rocket in China. Moreover, effective export controls on dual-use technology (with military and civilian applications) allow U.S. exporters to compete while protecting U.S. security interests. Officials have publicly disputed that there were objections within the executive branch to allowing recent satellite exports to China.

This CRS report provides detailed background information, significant Congressional action, and a comprehensive chronology. The events summarized below, based on various open sources and interviews, pertain to various aspects of U.S. foreign and security policy, including missile nonproliferation, export controls on technology useful for missiles and/or satellites, and Presidential waivers of sanctions imposed on China after the Tiananmen crackdown.

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China: Possible Missile Technology Transfers From U.S. Satellite Export Policy — Background and Chronology

Introduction

Members of Congress are concerned about allegations that U.S. firms provided expertise to China that could be used in its ballistic missile and space programs and that a series of decisions by the Clinton Administration on satellite exports have facilitated legal or illegal transfers of sensitive military-related technology to China. The *New York Times* reported in April 1998 that the Justice Department is conducting an ongoing criminal investigation into whether Loral Space and Communications Ltd. (of New York), and Hughes Electronics Corp. (of Los Angeles) violated export control laws.[1] The firms are alleged to have shared their findings with China, without approval from the U.S. government, on the cause of a Chinese rocket's explosion while launching a U.S.-origin satellite in February 1996. In sharing their conclusions, the companies are said to have provided expertise that China could use to improve the accuracy and reliability of its ballistic missiles, including their guidance systems. Several classified government studies reportedly concluded that the U.S. technical assistance provided to China damaged U.S. national security by helping the Chinese to improve the guidance systems on their ballistic missiles.

In addition, the media reports allege that President Clinton in February 1998 issued a waiver of sanctions that undermined the investigation by allowing the issuance of licenses for the export of technology or expertise similar to that in question — despite "strong opposition" from Justice. Moreover, political considerations are alleged to have influenced the Administration's decision, since Loral's chairman was the largest personal donor to the Democratic Party in 1996.

This CRS report provides detailed background information, significant Congressional action, and a comprehensive chronology. The events summarized below, based on various open sources and interviews, pertain to various aspects of U.S. foreign and security policy:

- Presidential waivers for exports of satellites, including the latest waiver for Chinasat-8 (built by Loral) during an ongoing criminal investigation into

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[1] Gerth, Jeff. "Companies are Investigated for Aid to China on Rockets," and "Aerospace Firms' Ties with China Raise Questions," *New York Times*, April 4 and 13, 1998.

alleged assistance by Loral and Hughes to China's missile program; waivers are for sanctions imposed after China's Tiananmen Square crackdown;
- sanctions imposed for missile proliferation by China's space launch company, China Great Wall Industry Corporation;
- quotas on Chinese launches of satellites;
- controls on exports of U.S.-origin satellites and/or satellite technology;
- export controls to prevent technology transfers that could contribute to China's ballistic missile force and/or military satellites.

Background

China Great Wall Industry Corporation

China Great Wall Industry Corporation (CGWIC, or China Great Wall) has been China's commercial space launch company since 1986. It is a state-owned corporation in China's defense-related aerospace industry. China Great Wall is a subsidiary of the China Aerospace Corporation (abbreviated by China as CASC), which oversees China's space as well as missile research and development establishment. CASC and its subordinate companies, research academies, and factories develop and produce strategic and tactical ballistic missiles, space launch vehicles, surface-to-air missiles, cruise missiles, and military (reconnaissance, communications, or other) and civilian satellites. CASC was established in 1993. It was previously known as the Ministry of Aerospace Industry, which was also known as the Seventh Ministry of Machine Building.

China reportedly launched its first satellite, Dongfanghong ("East is Red") on April 24, 1970. By the end of 1997, China reportedly had launched 40 domestic satellites: 17 retrievable reconnaissance satellites, 3 meteorological satellites, 8 communications and broadcasting satellites, and 12 "experimental" (possibly military) satellites. China is using the satellites and space technology to enhance its national defense, economy, and international prestige.[2] On April 7, 1990, China Great Wall launched a foreign satellite, Asiasat, for the first time.[3] Since then, the company has expanded its foreign business, especially with U.S. firms such as Hughes Electronics, Lockheed Martin, and Loral Space and Communications. China probably seeks foreign capital and technology to apply to its domestic satellite research and development efforts, in part to lessen reliance on purchasing foreign satellites. For example, the president of the Chinese Academy of Space Technology said that the Chinese Dongfanghong (East is Red) satellites match the capacities of advanced satellites built by Hughes, but are backward in satellite navigation and

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[2]Chou Kuan-wu, "China's Reconnaissance Satellites," *Kuang Chiao Ching* (in Hong Kong), March 16, 1998; translated in FBIS.

[3]For commercial space launches in general, see CRS Issue Brief 93062, *Space Launch Vehicles: Government Requirements and Commercial Competition*, and CRS Report 98-575, *China's Space Program: A Brief Overview Including Commercial Launches of U.S.-Built Satellites*, by Marcia S. Smith.

stabilization technologies. The Academy hopes to sell its satellites at world standards by 2000.[4]

China has experienced a number of embarrassing and costly failed satellite launches. In 1992, a Chinese rocket stalled while attempting to launch the Optus-B1 satellite and another rocket exploded and destroyed the Optus-B2 satellite (both built by Hughes). In 1995, A Long March rocket exploded and destroyed the Apstar-2 satellite (built by Hughes). In 1996, another Chinese rocket exploded and destroyed the Intelsat satellite (built by Loral). Aside from the dramatic explosions, other problems have prevented the Chinese rockets from successfully launching satellites into the correct orbits.

China's aerospace industry has shifted from denying all responsibility in failed launches of foreign satellites to expressing willingness to work with foreign companies in determining the causes of explosions and other failures. This practice may have been a strategy to learn from foreign companies methods to improve China's rockets, satellites, and other related space technology. China may also have been requested by insurance companies and satellite manufacturers to share information about problems in Chinese rockets to show that the problems were being solved.

Missile Technology or Expertise

Security Concerns. One question in the controversy involves the applicability of satellite-launch technology to the modernization of China's ballistic missiles. China Great Wall uses the Long March series of rockets to launch satellites. China's "Long March (LM)" ("*Chang Zheng*") space launch vehicles (SLVs) are related to its "East Wind" ("*Dong Feng*" (DF)) intercontinental ballistic missiles (ICBMs). China has used the LM rockets to launch its own satellites (since 1970) and foreign satellites (since 1990). The Long March boosters are also produced as China's CSS-3 (DF-4) and CSS-4 (DF-5A) ICBMs deployed in the Second Artillery, the strategic missile force of the People's Liberation Army (PLA), China's military. China's launch facilities, such as the Xichang Satellite Launching Center in Sichuan province, are at PLA bases.

Corresponding Designations

	U.S.	Chinese
ICBM:	CSS-3	DF-4
ICBM:	CSS-4	DF-5A
SLV:	LM	CZ

A review of open sources finds agreement that the first Long March rockets used to launch satellites were derived from ballistic missiles developed earlier and that there has been parallel research and development for the modernization of the SLVs and ICBMs.[5] The CSS-3 ICBM has also been produced as the booster for the

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[4]Parker, Jeffrey. "China to Expand Rocket Production," *Reuters*, August 25, 1993.

[5]Defense Intelligence Agency, *Handbook of the Chinese People's Liberation Army*, November 1984; John Wilson Lewis and Xue Litai, *China Builds the Bomb* (Stanford

(continued...)

LM-1 SLV. The CSS-4 ICBM has also been used as the booster for the LM-2, LM-3, and LM-4 series of SLVs. In a 1984 publication, the Defense Intelligence Agency (DIA) called the LM-1 SLV the "booster variant" of the CSS-3, and LM-2 the "booster variant" of the CSS-4. Indeed, this factor has made it difficult to accurately count the numbers of ICBMs that China has produced and allows for China to increase the potential number of ICBMs available for deployment.

Future developments in China's ICBM program are believed to be related to that in the space launch program. U.S. intelligence reportedly has gained information about developments in China's ICBMs from information about Chinese SLVs.[6] *Jane's Space Directory 1997-98* notes that China is not known to use liquid oxygen/kerosene engines that are used extensively in other countries, "reflecting the space variants' parallel development alongside storable propellant long range missiles." China has used a variant of the LM-2C with a smart dispenser to launch two Iridium satellites from one rocket, in several launches. In addition, China reportedly will add a new solid-propellant third stage (TS) to introduce a new LM-2E/TS SLV. This third stage may have a multiple-satellite dispenser to launch up to 12 satellites. China reportedly is developing new land-mobile, solid-fuel DF-31 and DF-41 ICBMs for deployment in the next century. China's ICBMs are not believed to have MIRVs (multiple independently targeted reentry vehicles), although such a capability is reportedly in development.[7]

When the Reagan Administration first decided to allow China to launch U.S.-origin satellites, it cited the need to protect "legitimate U.S. national security interests" and promised Congress that an agreement would be concluded with China to safeguard U.S. technology from "possible misuse or diversion."[8] Such an agreement on technology safeguards was signed on December 17, 1988, but apparently required renegotiation. A new agreement was signed on February 11, 1993. One question concerns whether China has abided by these agreements.

Loral's Case. Specifically, the focus of the investigation is on Space Systems/Loral (SS/L), Loral's subsidiary in Palo Alto, CA, which chaired a review

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[5](...continued)
University Press, 1988); Lennox, Duncan, "China's Development of Ballistic Missiles," *Jane's Intelligence Review*, August 1991; Phillip S. Clark, "Chinese Launch Vehicles — Chang Zheng 1," "Chinese Launch Vehicles — Chang Zheng 2," "Chinese Launch Vehicles — Chang Zheng 3," "Chinese Launch Vehicles — The Rest of the Story," "Chinese Launch Vehicles — Further Details," *Jane's Intelligence Review*, November 1991, May 1992, August 1992, October 1992, June 1993; John Wilson Lewis and Hua Di, "China's Ballistic Missile Programs," *International Security*, Fall 1992; Iris Chang, *Thread of the Silkworm* (BasicBooks, 1995); "People's Republic of China: Offensive Weapons, *Jane's Strategic Weapon Systems*, September 1997; *Jane's Space Directory 1997-98.*

[6]Pincus, Walter, "U.S. Gains Intelligence Data in China Launches," *Washington Post*, June 13, 1998.

[7] On China's ICBMs currently deployed and under development, see: CRS Report 97-391, *China: Ballistic and Cruise Missiles*, by Shirley A. Kan and Robert D. Shuey.

[8] "Export of U.S. Satellite to China for Launch," *Department of State Bulletin*, November 1988.

committee on the launch failure of February 1996. As for Loral's case, Acting Undersecretary of State John Holum confirmed on April 9, 1998, that after the accident in February 1996, the Department of State "became aware that there may have been a violation." The case was referred to the Department of Justice for investigation. He said that there are "strong legal remedies" for violations of export control laws, including a denial of future licenses.

Loral issued a statement on May 18, 1998, saying that allegations that it provided missile guidance technology to China are false. Loral also says that it did not advise China "on how to fix any problems with the Long March rocket." The company states that "the Chinese alone conducted an independent investigation of the launch failure [in February 1996] and they determined that the problem was a defective solder joint in the wiring — a `low-tech' matter." Loral denied that it and Hughes conducted an independent investigation to determine the cause of that launch failure. However, at the insistence of insurance companies, which required non-Chinese confirmation of resolutions of problems with Long March rockets, Loral formed a committee of several satellite companies, including Hughes, to review the Chinese investigation. According to Loral, the review committee obtained information from the Chinese and was not formed to help them solve their problems. The review agreed with the Chinese conclusion (that a defective solder joint was responsible), without performing tests or providing any test data to the Chinese. The committee did note that further tests by China would be required to establish certainty. Loral says that, during the review, it discussed the committee's work with U.S. officials. As far as Loral's engineer's can determine, the statement says, "no sensitive information — no significant technology — was conveyed to the Chinese."

Loral has further explained that in April 1996, at China's request, Dr. Wah L. Lim, a Senior Vice President and engineer at Loral, chaired a review committee to study China's technical evaluation of the cause of the accident on Feb. 15, 1996. Loral says China had identified the problem as residing in the inertial measurement unit (IMU) of the guidance system of the rocket. Loral believed that it did not have to request a U.S. government license and monitoring. The first meeting was held in Palo Alto, CA, and the second, in China. The Chinese participated in the reviews.

Nevertheless, Loral admitted that, contrary to its policies, "the committee provided a report to the Chinese before consulting with State Department export licensing authorities." According to Loral, as soon as its executives found out in May 1996, the company notified the Departments of State and Defense. In June 1996, Loral provided to the U.S. government a detailed, written report concerning all communications with China. Loral adds that it is in full cooperation with the Justice Department in its investigation and with Congressional committees. Loral concludes that based upon its own review, it "does not believe that any of its employees dealing with China acted illegally or damaged U.S. national security." In addition, the statement says that Loral's chairman, Bernard Schwartz, was not personally involved in any aspect of this matter. "No political favors or benefits of any kind were requested or extended, directly or indirectly, by any means whatever." Loral also denies any connection between the launch failure in February 1996 and the Presidential waiver for another Loral-built satellite in February 1998. The export license for the latest launch (for Chinasat-8) "applied the strictest prohibitions on technology transfer and specified that any new launch failure investigation would

require a separate license." Loral stresses that it complies strictly with export control laws and regulations.

Administration officials say that export licensing procedures and strict security measures (including monitoring by the Defense Department of pre-launch meetings and the launches) preclude any assistance to the design, development, operation, maintenance, modification, or repair of any launch facility or rocket in China. Moreover, Undersecretary of Commerce William Reinsch testified to Congress on April 28, 1998, that effective export controls on dual-use technology (with military and civilian applications) allow U.S. exporters to compete while protecting U.S. security interests. He disputed that there were objections within the executive branch to allowing recent satellite exports to China, saying that since November 1996 (when the licensing jurisdiction was transferred from the Department of State to Commerce), the Commerce Department has issued three export licenses for satellites to be launched from China — with the concurrence of all agencies.

However, at least three classified studies have found serious concerns about the U.S. firms' assistance to China's ballistic missile modernization program. A classified report at the Department of Defense's Defense Technology Security Administration (DTSA) reportedly concluded on May 16, 1997, that Loral and Hughes transferred expertise to China that significantly enhanced the guidance and control systems of its nuclear ballistic missiles and that "United States national security has been harmed," according to the *New York Times* (April 13, 1998 and June 27, 1998). These concerns were first raised in a classified report at the Air Force's National Air Intelligence Center (NAIC) in March 1997 and supported by the State Department's Intelligence and Research Bureau (INR), according to the *Washington Post* (June 7, 1998). These reports apparently prompted the Justice Department's investigation.

Also, the Justice Department had expressed concerns about the February 1998 Presidential waiver for the Chinasat-8 satellite. A memorandum, dated February 12, 1998, written by National Security Adviser Samuel Berger for President Clinton, acknowledged that the Justice Department "cautioned" that such a waiver "could have a significant adverse impact on any prosecution that might take place" in Loral's case.[9] Finally, there is little public information on the export licenses issued by the State Department for technical assistance agreements (TAAs) concerning the transfer of technical assistance and data needed to mate satellites to launch vehicles.

Applicability of Technology. Beyond the 1996 incident involving Loral and Hughes, there are wider concerns that the policy of allowing China to launch U.S.-built satellites effectively subsidizes and assists China's modernization of its ballistic missiles. Observers point out that the same Chinese companies are involved in both civilian and military programs and much of the technology used in launching satellites can be used in military programs, such as modernization of ballistic missiles. The Justice Department is now also investigating Hughes' report on the

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[9] The memorandum was printed in the *New York Times*, May 23, 1998.

launch failure on January 26, 1995, a report that the Commerce Department approved for release to China without consulting the Pentagon.[10]

Some are especially concerned about Chinese launches in 1995 and 1996 of three satellites built by Hughes which were not monitored by the Defense Department. On June 18, 1998, Jan Lodal, Principal Deputy Under Secretary of Defense for Policy, testified to a joint hearing of the House National Security and International Relations Committees that there were three launches that were not monitored by the Defense Department, because the satellites did not require State Department licenses and monitoring had been tied to licenses from the State Department for Munitions List items. The Director of DTSA, Dave Tarbell, testified to the Senate Select Committee on Intelligence on July 15, 1998, that the three unmonitored launches took place in January 1995 (Apstar-2), July 1996 (Apstar-1A), and August 1996 (Chinasat-7). The Department of Defense then concluded that full monitoring should be required for satellites licensed by the Commerce Department, and the requirement was added after late 1996, he said. Nevertheless, Tarbell stated that "we are not aware of any transfer of technology from these unmonitored launches that contributed to China's missile or military satellite capabilities." Hughes responds that its security measures prevented unauthorized technology transfers. In addition, Senator Kyl reported on July 16, 1998, that there was no monitoring of pre-launch technical exchanges on the mating of satellites to the launch vehicles for three satellite projects: Optus B-3 (Hughes), Echostar-1 (Martin Marietta), and Chinastar-1 (Lockheed Martin). Critics say that monitoring of these technical meetings is more crucial than monitoring the launches.

Beyond the question of whether sensitive technology or technical expertise in connection with satellite launches was transferred to China, there is disagreement on the extent to which such transfers have military benefit in the context of China's current modernization of its nuclear-armed ballistic missiles and space systems. Some, including officials in the Clinton Administration, stress differences between the Chinese SLVs and ICBMs and that there have been no *authorized* missile technology transfers to China. Jan Lodal, Principal Deputy Under Secretary of Defense for Policy, testified that there is "an important distinction between the space launch vehicles and the military ICBMs, which are different items. And the ICBMs, which are deployed today, have technologies in them that are considerably different from those technologies that are in the space launch vehicles. They have some overlapping technologies, of course. But we ... do not believe that there has been any transfer of these sensitive technologies. We don't have any evidence that there's been transfer of these sensitive technologies to their military programs that have made an impact on the Chinese military programs."[11]

John Pike, Director of the Space Policy Project at the Federation of American Scientists, also argues that there are significant differences between China's ballistic

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[10] Anselmo, Joseph C. and James R. Asker, "U.S. Broadens Probes of China Tech Transfer" and "Hughes Defends China Security," *Aviation Week and Space Technology*, June 29 and July 6, 1998.

[11] Joint Hearing of the House National Security and International Relations Committees, "U.S. Policy Regarding Export of Satellites to China," June 18, 1998.

missiles and the Long March SLVs.[12] He says that the Long March SLVs are longer than the CSS-4 ICBM, so they flex more during ascent. They also have bigger nose cones to hold satellites that are bigger than warheads. These characteristics have resulted in stresses on the Long March. He also says that deploying two satellites from one Long March (as China has done for Iridium) is very different from launching MIRVs. Warheads, unlike satellites, are designed to survive greater vibrations and the heat of reentering the atmosphere.

Other experts stress that there are commonalities between the technology as well as technical expertise used in rockets and missiles. A Senate subcommittee provided a graphical comparison of the applicability of technology in SLVs and ballistic missiles prepared by the Central Intelligence Agency (CIA).[13] In general terms, the CIA compared 11 categories of technology and equipment. Six, or more than half, of the categories are the same for the SLV and ICBM; four categories are similar; while only missiles contain warheads.

Technology and equipment generally unique to ballistic missiles:
- warhead

Technology and equipment that are similar in SLV and ICBM (comparison requires case-by-case analysis):
- reentry vehicle
- payload separation
- inertial guidance and control systems
- strap-on boosters

Technology and equipment that are same in SLV and ICBM:
- staging mechanisms
- propellants
- air frame, motor cases, liners, and insulation
- engines or motors
- thrust vector control systems
- exhaust nozzles

Henry Sokolski (Executive Director of the Nonproliferation Policy Education Center and a Defense official in the Bush Administration) argues that "all of our satellite transfers have helped China perfect its military rocketry." He also writes that "intangible technology" is critical to the timely, reliable, and accurate placement of satellites into space as well as launches of warheads against targets by ballistic missiles. Intangible technologies include: coupling load analysis, guidance data packages, upper-stage solid rocket propellant certification, upper-stage control design validation, lower-stage design validation, and general quality assurance. Also, multi-satellite dispensers, or smart dispensers, can be used as multiple-warhead dispensers,

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[12] "The China Satellite Debate," *Proliferation Brief*, June 23, 1998.

[13] Hearing of the Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, "The Benefits of Commercial Space Launch for Foreign ICBM and Satellite Programs," May 21, 1998.

thus assisting China's reported efforts to develop a capability in MIRVs for its ICBMs.[14] China has used such dispensers to launch multiple satellites for Iridium.

Two experts at the Monterey Institute of International Studies also point out that a significant portion of the components, technology, and expertise used in the research and development of SLVs are "virtually interchangeable" with that of ballistic missiles. These overlaps include: launching multiple satellites from a single SLV and delivering multiple warheads on a single missile. Similar technology involves upper stage control systems (separation and ignition of the upper stage, attitude control, and spin release of satellites), satellite dispensers (delivery of multiple satellites to separate orbits), coupling load analysis (to assure launches without damaging payloads), upper stage solid-fuel engines, and kick motors (to deliver satellites into correct orbits).[15]

Nevertheless, they also argue that having the capability to launch multiple satellites does not translate into having a military capability to deliver MIRVs. Delivering multiple reentry vehicles into planned trajectories is more difficult than launching multiple satellites into orbit. MIRV capability requires greater precision. Reentry vehicles, unlike satellites, do not have their own kick motors. A MIRV capability requires rocket motors that can stop and restart.

However, *Jane's Space Directory 1997-1998* reported that China developed a restartable, cryogenic (extremely low temperature) stage 3 for the LM-3 SLV. A classified study by the Air Force's National Air Intelligence Center (NAIC) reportedly concluded that the new Chinese-developed "smart dispenser," an upper-stage booster used to launch two satellites for Iridium on one LM 2C/SD rocket, could be modified to deploy multiple re-entry vehicles, according to the *Washington Times*, July 14, 1998. Nevertheless, the report noted that there is no evidence that China is using the dispenser for warheads. A Pentagon spokesman said on July 14, 1998, that Motorola provided data to allow the Chinese to attach satellites to the dispenser that they designed without U.S. help and that releasing multiple satellites and targeting multiple warheads require different technology.

Sanctions

China Great Wall has been affected by two categories of sanctions imposed on China: those imposed after the Tiananmen crackdown and those imposed for missile proliferation. In 1990, the United States imposed post-Tiananmen sanctions as required in the Foreign Relations Authorization Act for FY1990 and FY1991 (P.L. 101-246). Sec. 902(a) requires suspensions in programs related to: (1) Overseas Private Investment Corporation, (2) Trade and Development Agency, (3) exports of Munitions List items, (4) exports of crime control equipment, (5) export of satellites for launch by China, (6) nuclear cooperation, and (7) liberalization of export controls. Suspensions (3) and (5) affected export of satellites to China. Sec. 902(b) allows

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[14] Sokolski, Henry, "US Satellites to China: Unseen Proliferation Concerns," *International Defense Review*, April 1994; "Selling China the Rope...," *Weekly Standard*, June 1, 1998.

[15] Lamson, James A. and Wyn Q. Bowen, "'One Arrow, Three Stars:' China's MIRV Program," *Jane's Intelligence Review*, May 1997.

Presidential waivers of those suspensions by reporting that "it is in the national interest" to terminate a suspension.

As for sanctions related to missile proliferation, on April 30, 1991, the Bush Administration denied licenses for the export of U.S. parts for a Chinese satellite, the Dongfanghong-3, citing "serious proliferation concerns." On May 27, 1991, President Bush declared sanctions on China for transferring to Pakistan technology related to the M-11 short-range ballistic missile. These sanctions, required by Sec. 73(a) of the Arms Export Control Act (P.L. 90-629) and Sec. 11B(b)(1) of the Export Administration Act (P.L. 96-72), were intended to enforce the Missile Technology Control Regime (MTCR). These sanctions, which took effect on June 16 and 25, 1991, denied export licenses and waivers of sanctions for: (1) high-speed computers to China, which can be used for missile flight testing; (2) satellites for launch by China; and (3) missile technology or equipment. They affected two Chinese aerospace corporations: China Great Wall and China Precision Machinery Import Export Corporation. President Bush waived these sanctions on March 23, 1992, after China agreed to abide by the MTCR guidelines.

The Clinton Administration had to impose similar sanctions on August 24, 1993, after China was again determined to have transferred M-11 related equipment to Pakistan. A total of 11 Chinese defense industrial companies were sanctioned, including China Great Wall again. Beginning in 1993, the U.S. aerospace industry and aerospace company executives lobbied against sanctions and for expansion of satellite exports to China. China, on October 4, 1994, agreed not to export ground-to-ground missiles inherently capable of delivering at least 500 kg to at least 300 km — an understanding the U.S. side sought to include the M-11 missiles under the MTCR. On November 1, 1994, the Clinton Administration waived those sanctions.

Waivers

Since sanctions were imposed after the Tiananmen crackdown in 1989, Presidents Bush and Clinton have issued 13 waivers for 20 satellite projects (each project may involve more than one satellite), based on "national interest," on a case-by-case basis, to allow the export to China of U.S.-origin satellites or components subject to export controls. (See Table below.) Waivers have been increasingly issued for satellites used by China — not just launched from China. Some waivers under P.L. 101-246 have specified whether sections 902(a)(3) and 902(a)(5), on Munitions List items and satellites, applied; others simply referred to section 902 or 902(a).

Also, the policy of allowing China to launch U.S.-built satellites has been tied to the missile nonproliferation policy, because the same company was involved in both. Nevertheless, during the two periods of sanctions on China Great Wall and other Chinese companies for missile proliferation, one Presidential waiver of post-Tiananmen sanctions was issued (on July 13, 1994) for China Great Wall to launch U.S.-built satellites. The Clinton Administration has considered supporting China as a partner in the MTCR, issuing a blanket waiver of sanctions on satellites, and increasing the quota on the numbers of satellites China is allowed to launch — in

return for further cooperation in missile nonproliferation, according to a Secret March 12, 1998, National Security Council memo printed in the *Washington Times.*[16]

[16] See: CRS Issue Brief 92056, *Chinese Proliferation of Weapons of Mass Destruction: Current Policy Issues*, by Shirley A. Kan.

Table: Presidential Waivers of Post-Tiananmen Sanctions for Exports of Satellites or Parts to China

Satellite Project (may have multiple satellites per project)	End-User	Manufacturer	Waiver
Asiasat-1	Asia Satellite	Hughes	12/19/89
* Asia Satellite Telecommunications is a consortium based in Hong Kong and owned by China International Trust and Investment Corporation (CITIC) of China, Cable and Wireless of Britain, and Hutchison Telecommunications Ltd. Of Hong Kong.			
Aussat (Optus)	Australia	Hughes	4/30/91
Freja	Sweden	various U.S.	
* In the first waiver, President Bush had waived sanctions for Aussat satellites, but he reissued a new waiver and licenses. He also denied export licenses for U.S. components for a Chinese satellite, Dongfanghong-3 (waived later).			
Asiasat-2	Asia Satellite	Martin Marietta	9/11/92
Apsat (or Apstar)	APT Satellite	Hughes and Loral	
Intelsat-708	Intelsat	Loral	
Starsat		(canceled)	
AfriSat (AfriStar)	Afrispace	Alcatel	
Dongfanghong-3	China	China	
Iridium	Iridium	Lockheed Martin	7/2/93
Intelsat-8	Intelsat	Lockheed Martin	
Echostar	Echostar	Martin Marietta	7/13/94
Mabuhay (Agila 2)	Philippines	Loral	2/6/96
Chinastar-1 (Zhongwei-1)	China	Lockheed Martin	2/6/96
* Used by China Oriental Telecom Satellite Co.			
Chinasat-7	China	Hughes	2/6/96
Asia Pacific Mobile Telecommunications (APMT)	APT Satellite	Hughes	6/23/96
* Various Chinese state-owned companies invest in the project.			
Globalstar	Globalstar	Loral/Alcatel	7/9/96
Fengyun 1	China	China	11/19/96
SinoSat-1	China	Alcatel/ Aerospatiale	11/23/96
* Cooperative product between Daimler-Benz Aerospace and China Aerospace Corp.			
Chinasat-8	China	Loral	2/18/98

Congressional Action

Hearings

Since the Reagan Administration's decision in September 1988 to begin to allow U.S.-built satellites to be launched from China, Members of Congress have expressed concerns about the implications for U.S. national security. After the press reports in April 1998, several Congressional committees have held open and closed hearings:

Joint Economic Committee, April 28, 1998.
Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, May 21, 1998.
Senate Intelligence Committee, June 4, 1998.
Senate Intelligence Committee, June 5, 1998.
Senate Intelligence Committee, June 10, 1998.
Senate Foreign Relations Committee, June 11, 1998.
House National Security/International Relations Committees, June 17, 1998.
House National Security/International Relations Committees, June 18 and 23, 1998.
Senate Foreign Relations Subcommittee on East Asian/Pacific Affairs, June 18, 1998.
Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, June 18 and July 8, 1998.
Senate Intelligence Committee, June 24, 1998.
House Science Committee, June 25, 1998.
Senate Foreign Relations Committee, June 25, 1998.
Senate Governmental Affairs Committee, June 25, 1998.
Senate Intelligence Committee, July 8, 1998.
Senate Armed Services Committee, July 9, 1998.
Senate Intelligence Committee, July 15, 1998.
Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, July 29, 1998.

Investigations

In addition, House Speaker Gingrich announced on May 19, 1998, that he wanted to create a select committee, headed by Congressman Cox, to investigate the various allegations concerning this case. The House voted on **H.Res. 463** (Solomon) (409-10) on June 18, 1998, to create a Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China. The Select Committee has nine members: five Republicans (Representatives Cox, Goss, Hansen, Bereuter, and Weldon) and four Democrats (Representatives Dicks, Spratt, Jr., Roybal-Allard, and Scott). The special panel plans to conclude its investigation and issue a report by January 2, 1999.[17]

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[17] Also see CRS Report 98-549, *Transfer of Missile and Satellite Technology to China: A Summary of H.Res. 463 Authorizing a House Select Committee*, by Stephen W. Stathis; Francesca Contiguglia, "China Panel Hires Staff, Starts Meeting," *Roll Call*, June 29, 1998.

On May 20, 1998, Senate Majority Leader Lott announced the creation of a Task Force, led by Senator Shelby (chairman of the Intelligence Committee) and includes Senators Thurmond, Helms, Thompson, Cochran, Kyl, and Hutchinson. On May 29, Senate Democratic Leader Daschle approved a Democratic Task Force, with Senators Kerrey, Biden, Sarbanes, Glenn, Leahy, Levin, Kerry, and Feinstein.

On July 14, 1998, Senator Lott made a floor statement on interim findings that sensitive U.S. technology relating to satellite exports has been transferred to China and that those transfers provided military benefits. He reported five "major interim judgments:"

- the Clinton Administration's export controls on satellites are wholly inadequate;"
- sensitive technology related to satellite exports has been transferred to China;
- China has received military benefit from U.S. satellite exports;
- the Administration has ignored overwhelming information regarding Chinese proliferation and has embarked on a de facto policy designed to protect China and U.S. satellite companies from sanctions under U.S. proliferation laws;
- new information has come to light about China's efforts to influence the U.S. political process.

Senator Shelby stated on July 14, 1998, that "some of the tendencies of the evidence tend to support" Senator Lott's statement, but that "the Intelligence Committee has not reached any preliminary judgment." The Pentagon's spokesman, Kenneth Bacon, responded to Senator Lott by saying that this Administration has submitted requested documents to Congress and had inherited safeguards from previous Administrations that prevent inappropriate technology transfers to China.

Legislation

The House-passed National Defense Authorization Act for FY 1999 (**H.R. 3616**) includes amendments (sections 1206-1209) passed on May 20, 1998, that expresses the sense of Congress that the United States should not enter into new agreements with China involving space or missile-related technology (Spence, agreed 417-4); prohibits U.S. participation in investigations of Chinese launch failures (Bereuter, agreed 414-7); prohibits transfers of missile equipment or technology to China (Hefley, agreed 412-6); and prohibits the export or re-export of U.S. satellites to China (Hunter, agreed 364-54). Also, section 1212 would return control over licensing export of satellites from the Commerce Department to the State Department (under the Munitions List controlled under the Arms Export Control Act).

On June 4, 1998, Senator Hutchinson submitted an amendment to the Senate-passed Defense Authorization Act for FY 1999 (**S. 2057**), which was ordered to lie on the table. It sought to amend the language authorizing Presidential waivers of post-Tiananmen sanctions by substituting a narrower basis ("in the vital national security interest") for the current language ("in the national interest"), and add a requirement for the President to submit a detailed justification for each waiver.

On July 22, 1998, Senator Hutchinson filed but did not offer Amendment 3250 to the Senate-passed Defense Appropriations Act for FY 1999 (**S. 2132/H.R. 4103**) to transfer the export control of satellites back to the State Department and require

a detailed justification for Presidential waivers of post-Tiananmen sanctions for exports of satellites or defense articles. On July 30, 1998, Senator Kyl proposed Amendment 3398 to this bill to limit the use of funds pending the establishment of the position of Deputy Under Secretary of Defense for Technology Security Policy who would also serve as the director of DTSA.

Chronology

Note:[18]

Date	Event
1988	
9/9/88	The Reagan Administration notified Congress that it will approve the first export licenses for the use of Chinese space launch services (for one Asiasat and two Aussat satellites).
12/17/88	The United States and China signed an agreement to establish security procedures to safeguard U.S. satellite technology.
1989	
Jan. 1989	The United States and China signed an agreement for six years under which China agreed to charge prices for commercial launch services "on a par" with Western competitors and to allow China to launch nine U.S.-built satellites through 1994.
6/4/89	Crackdown on peaceful, political demonstrators in Beijing.
12/19/89	President Bush waived sanctions for export of Aussat-1, Aussat-2, and Asiasat communications satellites for launch from China, under sec. 610 of the Department of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations act 1990 (P.L. 101-162).
1990	
2/16/90	P.L. 101-246 enacted to require post-Tiananmen sanctions, including suspensions in approving exports to China of Munitions List items and satellites.
4/7/90	China Great Wall Industry Corporation, using a LM-3 rocket, launched a foreign satellite, Asiasat (built by Hughes), for the first time.
1991	

[18] For overview of U.S.-China relations, see CRS Report 97-484, *China-U.S. Relations: Chronology of Developments During the Clinton Administration*, by Kerry Dumbaugh.

4/30/91	President Bush waived sanctions under Sec. 902(b) of P.L. 101-246 to allow exports of Aussat-1 and -2 and Freja satellites for launch from China in part because China was not the end-user. President Bush denied a license to export U.S. satellite components for a Chinese satellite, Dongfanghong-3, citing "serious proliferation concerns." In addition, *Space News* (May 6-12, 1991) reported that President Bush's denial was to punish China for attempting to obtain classified missile-related technology. The license to export parts for Dongfanghong-3 was requested by a German firm, but the U.S. components were produced by M/A-COM, Inc. (Burlington, MA).
6/16/91	The Bush Administration announced sanctions to be imposed on China for transferring missile related technology to Pakistan. The sanctions affected high technology trade with China, covering (1) high performance computers, (2) satellites for launch from China (except for the Freja and Aussat satellites), and (3) sanctions for missile proliferation as required by the Arms Export Control Act and Export Administration Act (imposed on China Great Wall Industry Corp. and China Precision Machinery Import/Export Corp.). The U.S. sanctions were intended to enforce the MTCR.
6/25/91	The sanctions on the two Chinese state-owned companies for missile proliferation in Pakistan took effect.
11/21/91	After Secretary of State James Baker visited Beijing, the Chinese foreign ministry issued a vague statement that China "intends to abide" by the MTCR.
1992	
2/1/92	According to the Bush Administration, the Chinese foreign minister sent a secret letter to the U.S. Secretary of State promising to abide by the MTCR.
2/22/92	The Chinese foreign ministry issued a statement saying that "China will act in accordance with the guidelines and parameters of the existing missile and missile technology control regime in its export of missiles and missile technology," after the United States effectively lifts the June 1991 sanctions.
3/22/92	Aborted launch of Aussat (Optus-B1) satellite from China after LM-2E rocket malfunctioned and the rocket stalled on the launch pad. *Beijing Review* (Nov. 2-8, 1992) reported that the rocket's malfunction was caused by a fault in the ignition system which triggered an emergency shut-down.
3/23/92	The Bush Administration effectively waived the sanctions imposed in June 1991 on China for missile proliferation.
8/14/92	China successfully launched the Optus-B1 satellite (built by Hughes).

9/11/92 — President Bush waived sanctions under P.L. 101-246 to allow exports of five satellites (Asiasat-2, Apsat, Intelsat-7A, Starsat, and AfriStar) for launch from China and parts for China's Dongfanghong-3.

10/23/92 — Under the Bush Administration, the State Department issued a rule to amend section 38 of the Arms Export Control Act. The rule transferred commercial communications satellites that do not have certain sensitive characteristics (under nine categories) to the export licensing control of the Commerce Department. Military satellites and communications satellites with any of the nine categories of sensitive characteristics remained on the State Department's Munitions List.

Nov. 1992 — China may have supplied M-11 short-range ballistic missiles or related technology to Pakistan, according to President Clinton's report to Congress submitted in May 1993. This transfer may have been taken in retaliation for President Bush's decision in September 1992 to sell F-16 fighters to Taiwan.

12/21/92 — A Chinese LM-2E launch vehicle exploded and destroyed the Australian Optus-B2 satellite (built by Hughes) it was carrying. After the explosion, Chinese officials denied that Chinese rockets were responsible, blaming the satellite built by Hughes. *Aviation Week and Space Technology* (Jan. 30, 1995) reported that Hughes and China Great Wall Industry Corp. agreed to declare the cause of that failure to be undetermined. Some experts, however, reportedly identified the premature opening of the launch vehicle's payload fairing as causing the accident.

1993

2/11/93 — After renegotiating security procedures, the United States and China signed a new agreement on satellite technology safeguards, superseding the agreement of 12/17/88.

5/28/93 — President Clinton decided to extend most-favored-nation trade status to China with conditions on human rights, but no linkage to weapons proliferation. Nonetheless, after persistent reports that China was continuing to transfer missile components to Pakistan — if not complete M-11 short-range ballistic missiles, the President also reported to Congress that "at present, the greatest concern involves reports that China in November 1992 transferred MTCR-class M-11 missiles or related equipment to Pakistan."

7/2/93 — President Clinton waived sanctions under P.L. 101-246 to allow exports to China of Iridium and Intelsat-8 satellites for launch from China.

8/16/93 Hughes and CGWIC issued a joint statement after seven months of "vigorous and cooperative investigation" into the cause of the explosion on 12/21/92. The statement did not identify a cause, with each side denying blame.

8/24/93 The Clinton Administration determined that China had shipped M-11 related equipment (not missiles) to Pakistan and imposed sanctions required by the Arms Export Control Act and Export Administration Act. The sanctions were imposed on Pakistan's Ministry of Defense and 11 Chinese defense industrial aerospace entities, including China Great Wall Industry Corp. The sanctions denied U.S. government contracts and export licenses for missile equipment or technology (items in the MTCR annex) for two years. Exports of satellites were affected because of components such as "kick motors" used on missiles and installed on some satellites to boost them into orbit.

8/26/93 The U.S. aerospace industry lobby, including the Aerospace Industries Association, called on the Clinton Administration to weaken the missile proliferation sanctions.[19]

8/31/93 One week after imposing sanctions, Assistant Secretary of State Winston Lord said that "we're ready at any time to sit down with the Chinese, both to try to find a way to lift the sanctions if they cooperate but also to explain more fully the MTCR and its revised guidelines."

9/25/93 National Security Adviser Anthony Lake told the Chinese ambassador that the Clinton Administration was willing to negotiate a waiver of the sanctions, but a more formal and binding Chinese commitment than the one made in November 1991 was needed.

10/20/93 The *Washington Post* reported that top executives of U.S. satellite manufacturers, Martin Marietta Corp. and Hughes Aircraft Co., were lobbying intensively for the Clinton Administration to waive the export ban for satellites. Reportedly due to these objections from private industry (which were supported by the Commerce Department), the National Security Council (NSC) reviewed the decision to implement the sanctions. In September 1993, Norman R. Augustine, chairman of Martin Marietta, wrote a letter to Vice President Al Gore, arguing that the sanctions "present U.S. companies as an unreliable supplier." Some Members of Congress supported the export of satellites for launch from China.

11/9/93 The CEO of Hughes Aircraft Company, C. Michael Armstrong, delivered a speech in which he objected to the inclusion in the

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[19]"Statement by Don Fuqua, President of the Aerospace Industries Association, on the Imposition of U.S. Economic Sanctions on China," August 26, 1993; Steven Greenhouse, "Aerospace Industry Seeks Weaker Sanctions on China," *New York Times*, August 28, 1993.

sanctions of commercial communications satellites. He also said that he "asked the President of the United States to review the situation."

11/16/93 National Security Adviser Anthony Lake wrote a memo to President Clinton proposing the NSC's interpretation of the sanctions imposed in August to allow the export of two satellites controlled by the Commerce Department, but not the five controlled by the State Department. State had argued that all satellite licenses were suspended under the sanctions, but Commerce argued that sanctions did not cover any licenses. The President approved the NSC's recommendation.

11/19/93 President Clinton met with Chinese President Jiang Zemin at the Asian Pacific Economic Cooperation (APEC) meeting in Seattle. On the eve of the meeting, press reports said that the Administration had formally proposed waiving the sanctions in return for another Chinese promise, in more detail and with more authority, not to export MTCR-class missiles.

1994

1/6/94 The Clinton Administration announced a new policy exempting commercial communication satellites from sanctions for missile proliferation imposed on 8/24/93, facilitating export licenses for one Hughes and two Martin Marietta satellites.

4/2/94 A Chinese weather satellite exploded in a plant.

7/13/94 President Clinton waived sanctions under P.L. 101-246 for the Echostar satellite to be exported for launch from China.

7/21/94 A Chinese LM-3 rocket launched the Apstar-1 satellite (built by Hughes).

8/28/94 A Chinese LM-2E rocket launched Australia's Optus-B3 satellite (built by Hughes).

Sept. 1994 Secretary of Commerce Ron Brown led trade delegation to China, including Bernard Schwartz, Loral's chairman.

10/4/94 Secretary of State Warren Christopher and Foreign Minister Qian Qichen issued a joint statement in which the United States agreed to waive the August 1993 sanctions (for missile proliferation) and China agreed not to export "ground-to-ground missiles" that are "inherently capable" of delivering at least 500 kg to at least 300 km (an important understanding meant in part to include the M-11 missiles under the MTCR guidelines).

11/1/94 The Administration's waiver of the sanctions for missile proliferation took effect.

11/30/94 China launched its Dongfanghong-3 satellite, but failed to launch it into the correct position due to a fuel leak.

Dec. 1994 President Clinton selected Armstrong of Hughes to head the Export Council.

1995

1/26/95 A Chinese LM-2E launch vehicle exploded after liftoff, destroying the Apstar-2 satellite (built by Hughes) it was carrying. Hughes and China Great Wall Industry Corporation were reported as planning to determine the cause of the explosion. (*Aviation Week and Space Technology*, Jan. 30, 1995)

2/9/95 The *Wall Street Journal* reported that Chinese aerospace industry officials contradicted an official Chinese newspaper's account that blamed Hughes for the explosion on January 26, 1995. Instead of blaming Hughes, as *Ta Kung Pao* (in Hong Kong) did, officials from China Great Wall Industries Corp. and the China National Space Administration said that the article did not reflect China's official view and that the investigation had not concluded. A spokesman for Hughes said that a thorough investigation into the cause of the explosion would take months to complete.

3/13/95 The United States and China concluded a new agreement for 7 years to allow China to launch up to 11 new satellites to geostationary orbit at prices not less than 15 percent below that charged by Western competitors.

7/21-28/95 The PLA Second Artillery test-fired M-9 short-range ballistic missiles toward Taiwan, after Taiwan's president visited Cornell University in June.

7/25/95 Hughes and CGWIC issued a joint statement on separate findings of six-month investigations into the cause of the explosion on 1/26/95. CGWIC blamed strong winds for shaking Hughes' satellite apart, while Hughes said that severe winds caused the Chinese rocket's fairing to collapse.

8/15/95 Hughes provided to the Department of Commerce the final report on the investigation of the launch failure of Apstar-2. The report included a summary of information conveyed to China Great Wall during several meetings that took place from February to June 1995.

10/9/95 Secretary of State Warren Christopher initialed a classified memorandum to retain the State Department's licensing authority over commercial communications satellites (cited in *New York Times*, May 17, 1998).

11/28/95 A Chinese LM-2E rocket launched the Asiasat-2 satellite (built by Martin Marietta), but the bumpy launch knocked the satellite's antenna-feed horns out of alignment, resulting in a loss of signal power. Asiasat company claimed $58 million in insurance for the damage. (*Flight International*, Oct. 2-8, 1996).

12/6/95 President Clinton issued Executive Order 12981 giving the Departments of State, Defense, and Energy, and the Arms Control and Disarmament Agency authority to separately review export license applications submitted to the Department of Commerce under the Export Administration Act and relevant regulations.

12/28/95 A Chinese LM-2E rocket launched the Echostar-1 satellite (built by Martin Marietta).

1996

2/6/96 President Clinton waived sanctions under P.L. 101-246 for the Chinasat-7 satellite to be exported for launch from China.

2/6/96 President Clinton waived sanctions under P.L. 101-246 for 2 Cosat (later called Chinastar) satellites to be exported for launch from China.

2/6/96 President Clinton waived sanctions under P.L. 101-246 for the Mabuhay satellite to be exported for launch from China.

2/15/96 A LM-3B rocket exploded after liftoff, destroyed the Intelsat-708 satellite (built by Loral), and smashed into a village. The death toll was probably higher than the official report of six deaths and 57 injured.

3/8-15/96 Despite the dramatic explosion of a Chinese rocket one month before, the PLA's Second Artillery again test-fired M-9 short-range ballistic missiles toward targets close to Taiwan's ports, on the eve of Taiwan's first presidential election.

3/10-11/96 In further deterioration of U.S.-China relations, the United States deployed two carrier battle groups to waters off Taiwan, calling China's live-fire exercises "reckless" and "risky."

3/12/96 President Clinton approved a memo written by then deputy national security adviser Samuel R. Berger to reverse Secretary Christopher's decision of October 1995 and transfer export control authority over commercial satellites from the State Department to the Commerce Department (*New York Times*, July 18, 1998).

3/14/96 The Clinton Administration announced a decision to move commercial communications satellites from the Munitions List to the Commerce Control List of dual-use items, so that the export license

jurisdiction was moved from the Department of State to the Department of Commerce (implemented in November 1996).

April 1996 — At China's request, Dr. Wah L. Lim, a Senior Vice President and engineer at Loral, chaired a review committee to study China's technical evaluation of the cause of the accident on Feb. 15, 1996. Loral says China had identified the problem as residing in the inertial measurement unit (IMU) of the guidance system of the rocket. Loral believed that it did not have to request a U.S. government license and monitoring. The first meeting was held in Palo Alto, CA, and the second, in China. The Chinese participated in the two meetings.

5/7/96 — A draft preliminary report of the review committee was sent to all participants of the meetings. The report confirmed that the cause of the accident was an electrical flaw in the electronic flight control system. The report allegedly discussed weaknesses in the Chinese rocket's guidance and control systems. (*New York Times*, April 13, 1998)

5/10/96 — Loral's executive in charge of export controls told Dr. Wah Lim not to send the report to China.

5/13/96 — Loral's executives provided the report to the Departments of State and Defense.

6/17/96 — Loral provided a voluntary disclosure to the Department of State, concerning all communications with China. The company argues that its policy of consultation with the Department of State was not implemented, but it did not violate U.S. laws.

6/23/96 — President Clinton waived sanctions under P.L. 101-246 for the Asia Pacific Mobile Telecommunications (APMT) satellite to be exported for launch from China.

7/3/96 — China launched the Apstar-1A satellite (built by Hughes) on a LM-3 rocket.

7/9/96 — President Clinton waived sanctions under P.L. 101-246 for a Globalstar satellite to be exported for launch from China.

8/18/96 — China failed to launch its Chinasat-7 satellite (built by Hughes) into the correct orbit, after the third stage of the LM-3 rocket shut down early, reported the *Far Eastern Economic Review* (Aug. 29, 1996).

10/15/96 — President Clinton issued an Amendment to Executive Order 12981 (issued on 12/6/95) concerning export licensing procedures for commercial communications satellites and hot-section technologies for commercial aircraft engines that are transferred from the State Department's Munitions List to the Commerce Department's Commerce Control List (of dual-use items).

10/21/96 The Bureau of Export Administration of the Department of Commerce issued regulations to implement the transfer of commercial satellites from control under the Munitions List to the Commerce Control List.

11/5/96 The Department of State issued regulations to implement the transfer of commercial satellites from control under the Munitions List to the Commerce Control List, even if the satellites include individual components or technologies on the Munitions List.[20]

11/19/96 President Clinton waived sanctions under P.L. 101-246 for U.S. parts for the Chinese Fengyun-1 (FY-1) meteorological satellite. The waiver cited suspensions under sections 902(a)(3) and 902(a)(5), indicating that technologies controlled under the Munitions List were involved.

11/23/96 President Clinton waived sanctions under P.L. 101-246 for the Sinosat satellite to be exported for launch from China. The waiver cited suspensions under sections 902(a)(3) and 902(a)(5), indicating that technologies controlled under the Munitions List were involved.

1997

March 1997 The Air Force's National Air Intelligence Center (NAIC) reportedly concluded in a classified report that Loral and Hughes provided expertise that helped China to improve the guidance systems on its ballistic missiles and that U.S. national security was damaged (*Washington Post*, June 7, 1998). NAIC's report was sent to DTSA, the State Department, and the Justice Department.

5/12/97 China successfully launched its Dongfanghong-3 communications satellite, built by China Aerospace Corp. on a LM-3A rocket, prompting personal congratulations from top government and military leaders.

5/16/97 A classified report at DTSA concluded that Loral and Hughes had transferred expertise to China that significantly enhanced the reliability of its nuclear ballistic missiles and "United States national security has been harmed" (*New York Times*, April 13, 1998 and June 27, 1998).

May 1997 The U.S. Trade Representative (USTR) reported that China had violated the pricing provisions of a bilateral agreement on the Mabuhay launch.

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[20]Also see GAO report GAO/NSIAD-97-24, *Export Controls: Change in Export Licensing Jurisdiction for Two Sensitive Dual-Use Items*, January 1997.

6/10/97 China successfully launched its Fengyun-2, a second-generation Chinese meteorological satellite, on a LM-3 rocket.

8/19/97 China launched the Agila 2 (formerly called Mabuhay) satellite (built by Loral).

9/1/97 China launched two test satellites for Iridium to demonstrate the technical viability of the new Long March variant, LM-2C/SC.

9/10/97 The *Washington Times*, citing Israeli and U.S. intelligence sources, reported that China Great Wall Industry Corporation was supplying key telemetry equipment (for sending and collecting guidance data during flight tests) to Iran for its development of the Shahab-3 and Shahab-4 medium-range ballistic missiles.

Sept. 1997 Likely prompted by DTSA's report, the Department of Justice began its criminal investigation into allegations that Loral and Hughes illegally passed technical assistance to China. The investigation is still ongoing.

10/17/97 China launched Asia Pacific Telecommunications Satellite (ApStar-2R) (built by Loral) on LM-3B rocket.

10/27/97 The USTR announced that the United States and China agreed on new provisions for the Bilateral Agreement on Space Launch Services (signed in 1995). The new provisions set clear terms for Chinese pricing of launch services to low earth orbit.

Nov. 1997 After a summit in Washington, Chinese President Jiang Zemin visited a Hughes satellite plant in California.

12/8/97 China launched two satellites for Iridium (built by Motorola) on one Long March 2C/SD rocket to low earth orbit. The rocket had two stages and a smart dispenser on top that deployed the two satellites.

1998

2/12/98 National Security Adviser Samuel Berger wrote a memorandum for President Clinton on whether to waive post-Tiananmen sanctions for the export of a Loral-built Chinasat-8 satellite. Berger noted that the Department of State, with the concurrence of the Department of Defense and the Arms Control and Disarmament Agency, recommended the waiver. However, "the Criminal Division of the Justice Department has cautioned that a national-interest waiver in this case could have a significant adverse impact on any prosecution that might take place, based on a pending investigation of export violations" by Loral. (printed in the *New York Times*, May 23, 1998)

2/18/98 President Clinton waived sanctions under P.L. 101-246 for the Chinasat-8 satellite (built by Loral) to be exported to China. Loral says that it is the most powerful satellite that China has ever bought.

3/12/98 Gary Samore, Special Assistant to the President and Senior Director for Nonproliferation and Export Controls in the National Security Council, wrote a Secret memo proposing to support Chinese membership in the MTCR, issue a "blanket waiver" of the post-Tiananmen sanctions to cover all future satellite launches, and increase the number of space launches from China — in return for Chinese cooperation in missile nonproliferation. (The classified memo was printed in the March 23, 1998, *Washington Times.*)

3/16/98 Loral Space and Communications signed an agreement with China Great Wall Industry Corp. to launch five of Loral's communication satellites between March 1998 and March 2002 using Long March-3B rockets.

3/22/98 China Aerospace Corp. kicked off a Quality Promotion Plan to help ensure success in its commercial launch business in research, production, and testing.

3/26/98 China launched two Iridium satellites, built by Motorola, on a LM-2C/SD rocket. (According to China, this launch was China's 15th "successful" commercial launch for foreign customers since 1990.)

3/26/98 John Holum, Acting Under Secretary of State for Arms Control and International Security Affairs, concluded his visit to China and confirmed that he discussed increasing the quota on the number of satellite launches from China.

3/29/98 A Hong Kong newspaper owned by the Chinese government reported that China Aerospace Corporation found in its investigations into past failed launches of satellites that all the failures were caused by problems in production and management related to quality control. A previous explosion of an LM-3B rocket (on 2/15/96) was found to have been caused by a defect in a power pack nodal point which caused a short circuit when the rocket ignited, resulting in a malfunction in the inertial platform.

4/3/98 China's official news agency quoted Zhang Haiming, general-manager of a division of Lockheed Martin, as saying that the company is "consulting with the Chinese on satellite manufacturing."

4/4/98 The *New York Times* reported that a Federal grand jury is investigating whether Loral Space and Communications of New York and Hughes Electronics of Los Angeles provided expertise to China that "significantly advanced" the guidance systems of its ballistic missiles in studying the accidental destruction in February 1996 of a satellite built by Loral. Administration officials reportedly said that

the Department of Justice, fearing that its criminal investigation would be undermined, opposed the President's February 1998 waiver and approval for export of similar technology to China (for Chinasat-8). Loral's chief executive was reported as the largest personal donor to the Democratic National Committee for the 1996 election.

4/9/98 John Holum, Acting Undersecretary of State for Arms Control and International Security Affairs, stressed that exports of satellites to China for launch occur with an export license and strict security measures to "preclude assistance to the design, development, operation, maintenance, modification or repair of any launch facility or rocket in China, and we monitor that very carefully." He also confirmed that after the accident in February 1996, the Department of State "became aware that there may have been a violation." The case was referred to the Department of Justice for investigation. He said that there are "strong legal remedies" for violations of export control laws, including a denial of future licenses.

4/13/98 The *New York Times* again reported on the criminal investigation of Loral and Hughes, adding that a highly classified Pentagon report concluded in May 1997 that the companies had transferred expertise to China that "significantly improved" the reliability of China's nuclear ballistic missiles.

4/15/98 Loral's president and chief operating officer, Gregory Clark, stated that Loral "did not divulge any information that was inappropriate."

4/16/98 A Chinese Foreign Ministry spokesman stated that "the exchange of technical information about satellite launchings between U.S. companies and the Chinese aerospace department was a normal activity and fell under international rules." He also said that the companies "did not provide technical information about missile technology."

4/21/98 Loral's chairman and CEO, Bernard Schwartz, said that "we have done our own internal investigation, and I'm satisfied that our people acted well — good behavior and in compliance [with U.S. export control regulations]."

4/28/98 Under Secretary of Commerce for Export Administration William Reinsch testified to the Joint Economic Committee that satellite exports to China have shown how effective dual-use export controls allow U.S. exporters to compete and "win without risk to our national security." He said that controls on satellite exports to China are extensive and include measures to "reduce the risk" of illicit technology transfers. Since November 1996 (when the licensing jurisdiction was transferred from the Department of State to Commerce), Commerce issued three export licenses for satellites to be launched from China — "with the concurrence of all agencies."

4/30/98 A spokesman at the State Department, James Foley, denied a *Washington Times* report that the Administration presented China with a draft agreement for space cooperation. He admitted, however, that officials have considered scientific space cooperation as one way to encourage Chinese cooperation in missile non-proliferation. He also stressed that "there still is not any U.S. plan or proposal to offer China access to missile technology."

5/2/98 A Chinese Long March 2C/SD rocket launched two Iridium satellites (built by Motorola) to low earth orbit.

May 1998 The Justice Department began a preliminary inquiry into whether political donations influenced President Clinton's approval of satellites to China.

5/15/98 The *New York Times* reports that fund-raiser Johnny Chung told the Justice Department that part of his donations to the Democratic Party in the summer of 1996 came from the PLA through Liu Chaoying, a PLA lieutenant colonel (possibly retired) and a senior manager and vice president for China Aerospace International Holdings, Ltd. (a subsidiary of China Aerospace Corporation in Hong Kong). She is also a daughter of retired General Liu Huaqing, formerly a vice chairman of the PLA's command, the Central Military Commission, and formerly a member of the Standing Committee of the Politburo.

5/18/98 Loral issued a statement saying that allegations that it provided missile guidance technology to China are false. The company states that "the Chinese alone conducted an independent investigation of the launch failure [in February 1996] and they determined that the problem was a defective solder joint in the wiring — a `low-tech' matter." Loral denied that it and Hughes conducted an independent investigation to determine the cause of that launch failure. It was at the insistence of insurance companies, which required non-Chinese confirmation of resolutions of problems with Long March rockets, that Loral formed a committee of several satellite companies, including Hughes, to review the Chinese investigation. However, Loral admitted that, contrary to its policies, "the committee provided a report to the Chinese before consulting with State Department export licensing authorities." Loral adds that it is in full cooperation with the Justice Department in its investigation and with Congressional committees. Loral concludes that based upon its own review, it "does not believe that any of its employees dealing with China acted illegally or damaged U.S. national security." In addition, the statement says that Loral's chairman, Bernard Schwartz, was not personally involved in any aspect of this matter. "No political favors or benefits of any kind were requested or extended, directly or indirectly, by any means whatever." Loral also denies any connection between the launch failure in February 1996 and the Presidential waiver for another Loral-built satellite in February 1998. The export license for the latest launch (for Chinasat-8) "applied the strictest

prohibitions on technology transfer and specified that any new launch failure investigation would require a separate license." Loral stresses that it complies strictly with export control laws and regulations.

5/30/98 China launched its Chinastar-1 (Zhongwei-1) (built by Lockheed Martin) on a LM-3B rocket.

June 1998 The Justice Department expanded its investigation to examine whether Hughes violated export control laws in transmitting a report to China on the launch failure on January 26, 1995 that destroyed the Apstar-2 satellite. The Commerce Department had approved Hughes' report.

7/2/98 The State Department suspended the license issued in 1996 for Hughes that permitted Shen Jun, son of a Chinese lieutenant general, to work on a $500 million satellite deal for Asia Pacific Mobile Telecommunications (APMT) consortium. Lt. Gen. Shen Rongjun has been a Deputy Director of the Commission on Science, Technology, and Industry for National Defense (COSTIND) since 1985. The Administration is re-examining the APMT project, in part because the Chinese governmental investors include those with ties to the military: COSTIND, China Launch and Tracking Control, China Aerospace Corp., Ministry of Information and Industry, and China Telecommunications Broadcasting Satellite Corp. (Chinasat). Some are concerned about that the APMT satellite could be used by the Chinese military to improve command and control and that the satellite contains sensitive technologies, including a huge 40-ft.-wide antenna and on-board digital processor, also used in Hughes' classified, communications satellites used by the U.S. military.[21]

7/18/98 China launched Sinosat-1 (built by French companies, Alcatel and Aerospatiale) on a LM-3B rocket.

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[21] Also see: CRS Report 96-889, *China: Commission of Science, Technology, and Industry for National Defense (COSTIND) and Defense Industries*, by Shirley A. Kan; Bruce Dorminey and Michael Mecham, "China-led Asian Team Buys Hughes Geomobile Satellites," *Aviation Week & Space Technology*, May 18, 1998; Jeff Gerth, "Administration Rethinking $650 Million China Satellite Deal," *New York Times*, June 18, 1998; John Mintz, "Hughes Corp. Pressing White House to Clear New Deal with China," *Washington Post*, Aug. 9, 1998; Steven D. Dorfman, Vice Chairman of Hughes, July 13, 1998, letter to the State Department.

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