

SECTION II

ESPIONAGE AND DIVERSIONS

Several incidents of Chinese nuclear espionage--all reported by the press--have come to light in recent years. The most recent has been the theft of information describing the small, sophisticated W-88 thermonuclear warhead. Investigations in the past have focused on the theft of laser information useful for simulating nuclear explosions and on the theft of the secrets of the W-70 nuclear warhead, known as the neutron bomb. According to the U.S. General Accounting Office, China has also managed to obtain sensitive information during officially-sanctioned visits by its scientists to U.S. nuclear weapon laboratories.

In addition to espionage, China has benefitted from diversions. Chinese companies have diverted machine tools, high-performance computers and controlled materials from civilian to leaded guilty to charges that it illegally exported DEC computer equipment to China without first having obtained the required export control laws. Presented here are cases that have come to light recently. They may be a small fraction of the total number of thefts and diversions that have occurred.

PART A - ESPIONAGE

Case #1: Theft of information about the W-88 nuclear warhead

The report of a select committee of the U.S. House of Representatives, chaired by Representative Christopher Cox, indicates that China stole secret nuclear weapon design information from the Los Alamos National Laboratory in the mid-1980s. According to a report in the Wall Street Journal, the information described the W-88 nuclear warhead, which tops the U.S. Trident II submarine-launched ballistic missile. The information is said to have included general, but secret information about the warhead's weight, size, explosive power, and internal configuration. Although China does not appear to have developed a weapon system using this information, U.S. analysts believe China tested a warhead with characteristics similar to the W-88 in the mid-1990s. The stolen information could help China develop smaller, more powerful warheads for nuclear missiles and reduce the research and design time necessary to do so.

Although the espionage occurred in the mid-1980s, it was not detected until 1995, when American officials who were analyzing Chinese nuclear test results found similarities to the W-88. According to the New York Times, U.S. Government investigators identified a suspect, a

Chinese-American scientist at Los Alamos, and concluded that Beijing was continuing to steal secrets from the other U.S. weapons laboratories, which have been increasingly open to foreigners. Also in

1995, the CIA obtained a Chinese document that specifically mentioned the W-88 and described some of its design features. In late 1995 and early 1996, an Energy Department intelligence official, Notra Trulock, and his team took their findings to the FBI. The FBI proceeded to investigate the scientist and the allegations of stolen secrets, a process not yet complete. It was not until March 1999 that the scientist, Wen Ho Lee, was fired from Los Alamos, after failing a polygraph test and refusing to cooperate with the FBI investigation. Lee had been under investigation since late 1997, but was allowed to remain at his classified job and to travel. President Clinton's national security adviser, Samuel R. Berger, acknowledged that "there's no question" that China benefitted from the information leaked from the Los Alamos National Laboratory.

The warhead in question, the two-stage thermonuclear W-88, is highly sophisticated. The reentry vehicle reportedly weighs less than 800 pounds, is said to be only 68.9 inches long and has a base diameter of 21.8 inches. The warhead has a yield of 475 kilotons. It is estimated that 400 are in service, atop Trident II missiles.

Case #2: Lasers to simulate nuclear explosions

In 1997, Peter Lee, a Los Alamos scientist born in Taiwan, confessed that in 1995 he had passed information to China on the U.S. laser fusion program, on which he worked in the mid-1980s. The information was passed during an exchange program in which Lee lectured in China. The laser fusion program at Los Alamos was used to simulate nuclear explosions during laboratory research. Such research is useful in developing smaller and lighter nuclear warheads.

Case #3: The W-70 warhead (neutron bomb)

In 1981, a Taiwan-born scientist working at Lawrence Livermore National Laboratory reportedly resigned after being under investigation by the FBI for two years. The investigation focused on secrets provided to China on the U.S. W-70 warhead, or the neutron bomb, and is still underway. The neutron bomb was touted by the Soviets as the capitalist's bomb, since it kills through radiation effects rather than via high explosive impact, thereby leaving buildings intact while killing their occupants. It has been reported that the Chinese actually tested a neutron bomb in September 1988.

Case #4: Visits to U.S. nuclear weapon laboratories

Chinese nationals have managed to obtain sensitive information during U.S. government-sanctioned visits to U.S. nuclear weapon laboratories. A General Accounting Office (GAO)

report in 1988 identified several lab visits which included unauthorized discussions of sensitive subjects. These included the visit of eleven Chinese nationals to Lawrence Livermore National Laboratory to discuss inertial confinement fusion, which is useful for research into thermonuclear weapons. A second instance involved the visit of four Chinese nationals to U.S. nuclear weapon labs to discuss rail guns, free electron lasers, and particle beams. These topics relate to directed energy weapons. And two Chinese nationals visited Livermore to discuss the feasibility of manufacturing components for special cameras used in nuclear weapons tests. Despite the sensitive nature of these topics, none of the visits were identified as sensitive by the labs, and as a result, DOE was not alerted that additional security might be necessary.

In a follow-up report in 1997, the GAO found that “most of the problems with controls over foreign visitors persist.” The GAO found “that procedures for identifying sensitive subjects lack clear criteria and controls to ensure that visits potentially involving such subjects are reviewed by DOE.” Furthermore, the GAO concluded that “as in 1988, visitors with connections to foreign intelligence organizations were gaining access to laboratories without DOE and/or laboratory officials’ advance knowledge of the visitors’ connections.” In this light, the GAO’s 1997 findings that “since the end of the Cold War, the number of foreign visits to the laboratories has increased significantly,” and that “this increase is attributable primarily to visitors from China, India, and former Soviet states” are alarming. The average number of Chinese visitors to U.S. nuclear weapon labs jumped from 67 per year in 1988 to 488 per year by 1997.

PART B - DIVERSIONS

Case #1: High-accuracy machine tools (McDonnell Douglas and China National Aero-Technology Import-Export Corporation)

McDonnell Douglas and China National Aero-Technology Import-Export Corporation (CATIC) agreed in 1992 to co-produce MD-80 and MD-90 aircraft in China for that country’s domestic “trunk” routes. The four Chinese factories involved in the Trunkliner program included the Shanghai Aviation Industrial Corporation, the Xian Aircraft Company, the Chengdu Aircraft Industrial Corporation and Shenyang Aircraft Company.

The Shenyang Aircraft Corporation (SAC) is known as the “cradle of China’s jet fighter aircraft” because it has developed and produced more than two dozen types of military aircraft. The Chengdu Aircraft Industrial Corporation (CAIC) is reportedly China’s second largest fighter plane production base. It produces the F-7 (J-7 in China) series of fighter aircraft, and is reportedly cooperating with Pakistan’s Aviation Integrated Company and Russia’s Mikoyan Aero-Science Production Group (MASPG) in the development of the FC-1 lightweight multipurpose fighter plane. CAIC is also developing China’s J-10 multirole combat aircraft.

In May 1994, McDonnell Douglas submitted U.S. export license applications to ship sophisticated machine tools to China. The machine tools were to be wholly dedicated to the production of the 40 Trunkliner aircraft and were to be exported to the CATIC Machining Center in Beijing. However, at the time the license applications were being considered by the Department of Commerce, the Machining Center did not yet exist. McDonnell Douglas informed the U.S. government that construction of the facility would begin in October 1994. Aircraft parts production would start 14 months later.

The machine tools included five-axis milling machines, five-axis gantry profilers, five-axis numerical control machining centers, four-axis vertical profilers, three-axis milling machines, three-axis coordinate measuring machines, and a hydraulic stretch press. Five-axis machine tools can simultaneously cut and form metal in five different directions which allows them to produce parts with minimal weight and maximum strength. The machines had been used at a U.S. government-owned plant to produce parts for the B-1 bomber, C-17 military transport aircraft, and the Peacekeeper (MX) missile.

After the Commerce Department granted an export license, the machine tools were shipped to three locations contrary to the license conditions and CATIC's assurances regarding end-use. Six machine tools, including a hydraulic stretch press, a five-axis machine tool, three three-axis machine tools, and a coordinate



measuring machine, were diverted to the China Nanchang Aircraft Manufacturing Corporation and the rest were stored in two locations in Tianjin, near Beijing. China Nanchang produces military aircraft and Silkworm anti-ship cruise missiles (above).

McDonnell Douglas officials reported the diversion to the U.S. government after the company had inventoried the equipment on March 24, 1995, in accordance with license conditions. McDonnell Douglas officials later reported that the stretch press had been installed in a new building designed specifically to house it. Satellite photos showed that the building was under construction even as the Chinese were promising Clinton administration officials that they would use the stretch press at the Beijing machining center.

After the diversion was discovered, McDonnell Douglas arranged for all of the equipment except the stretch press to be moved from Nanchang to Shanghai. In April 1996, about a year after the diversion was first reported, a U.S. Embassy official confirmed that all the machine tools, except the stretch press, were in Shanghai. The case is pending before a federal grand jury.

Case #2: High-performance computers (Silicon Graphics and the Chinese Academy of Sciences)

In 1996, Silicon Graphics sold a powerful supercomputer, capable of performing approximately six billion operations per second, to the Chinese Academy of Sciences, China's highest academic institution. The Academy performs research in the nuclear, missile and military fields and it develops computers, semiconductors, and microelectronics. It helped develop a computer for China's DF-5 intercontinental ballistic missile, and has helped in the development of liquid hydrogen and oxygen rocket boosters. The computer was sold without an export license and the sale is now being investigated.

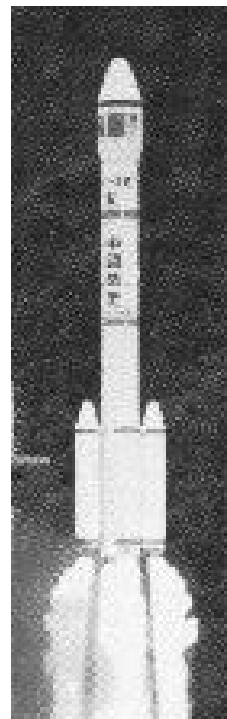
According to information published by Silicon Graphics, the supercomputer, when shipped, was the "most powerful SMP supercomputer in China," and provided China with "computational power previously unknown." The computer, which was financed by a loan from the World Bank, has become the centerpiece of the Academy's Computer Network Information Center. According to the Academy, the computer is now available to "all the major scientific and technological institutes across China." This means that any Chinese organization that is designing nuclear weapons or long-range missiles has access to it. Chinese weapon designers can use the Silicon Graphics machine to design lighter nuclear warheads to fit on longer-range and more accurate missiles capable of reaching U.S. cities.

Case #3: High-performance computers (Sun Microsystems and the National University of Defense Technology)

In 1997, it was revealed that China had diverted a supercomputer, manufactured by Sun Microsystems, from a civilian site to the National University of Defense Technology, which is operated by the People's Liberation Army. The university trains technical personnel in scientific research, design, production, test and operation of sophisticated weapons and equipment, and trains technical personnel and commanders from strategic weapon test and operation units. It also performs research on missile design, detonation physics, automatic target recognition, rocket engine design, aerodynamics, solid mechanics, and experimental mechanics.

Case #4: Missile technology (Hughes Space and Communications Company)

An investigation by the Pentagon's Defense Threat Reduction Agency and National Air Intelligence Center determined that Hughes Space and Communications Company directly aided China's rocket program when it collaborated with Chinese engineers to assess the causes of the failed 1995



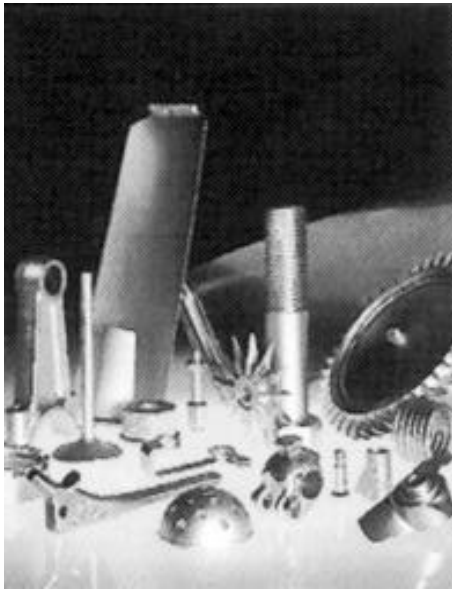
launch of a Long March 2E rocket (previous page) carrying the Apstar II satellite. This aid included the provision of specific details on modifying the fairing design and launch operations of Chinese rockets to improve their performance. It also included insight into U.S. diagnostic techniques that would allow Beijing's engineers to detect flaws in launch vehicles, whether they were used to launch satellites or missiles. This insight was sufficient to help the Chinese to perform more accurate coupled loads analysis and to improve China's finite elements model.

Case #5: Computers (Gateway 2000)

On June 19, 1998, the Commerce Department imposed a \$402,000 civil penalty on Gateway 2000, Inc. of North Sioux City, South Dakota, to settle allegations that, on 30 separate occasions, Gateway 2000 exported U.S.-origin computer systems to 16 countries, including Iran, Syria and China, without the required validated export licenses that it knew or had reason to know were required by the Export Administration Regulations. The Department also alleged that, on 27 separate occasions, Gateway 2000 filed Shipper's Export Declarations containing false or misleading statements of material fact.

Case #6: Sintering furnace (Advanced Vacuum Systems, Inc.)

On May 1, 1997, the Commerce Department imposed a \$5,000 civil penalty on Advanced Vacuum Systems, Inc. (AVS), of Ayer, Massachusetts, for allegedly exporting commodities to China without obtaining the required export license. Based on an investigation conducted by Export Enforcement's Boston Field Office, the Department alleged that AVS exported a low pressure sintering furnace and spare parts valued at over \$600,000 to the PRC without the required export license. At the time of the export, the furnace was controlled worldwide for nuclear nonproliferation reasons.



Case #7: Titanium alloys (Allvac)

On January 22, 1997, the Department imposed a \$122,500 civil penalty on Allvac, a Monroe, North Carolina, manufacturer, to settle allegations that the company violated the Export Administration Regulations. Based on an investigation conducted by Export Enforcement's Washington Field Office, the Department alleged that Allvac made 48 shipments of titanium alloy products (samples at left) from the United States to Australia, China, France, Ireland, Israel, Italy, Japan, Germany, Switzerland, Taiwan, and the United Kingdom, as well as one shipment of a maraging steel product from the United States to Germany, all without the required U.S. export licenses.

Case #8: Computers (Compaq Computer Corporation)

On April 18, 1997, the Commerce Department imposed a civil penalty of \$55,000 on Compaq Computer Corporation, of Houston, Texas, for allegedly exporting computer equipment without obtaining the required validated licenses, in violation of the Export Administration Regulations. Based on an investigation conducted by Export Enforcement's Dallas Field Office, BXA alleged that, on three separate occasions from September 1992 through June 1993, Compaq exported computer equipment from the United States to Venezuela, Chile, and China without obtaining the required validated licenses.

Case #9: Computers (Digital Creations)

On June 13, 1997, United States District Court Judge William Walls of the District of New Jersey fined Digital Creations Corporation of Closter, New Jersey, \$800,000 for violating the Export Administration Act and Regulations. In December 1994, Digital Creations Corporation pleaded guilty to charges that it illegally exported DEC computer equipment to China without first having obtained the required export license from the Commerce Department.

Case #10: Computers (Lansing Technologies Corporation)

On June 17, 1997, Lansing Technologies pleaded guilty in U.S. District Court to exporting a vector computer processor and a data acquisition control system to China without the required export licenses. Lansing was fined \$10,000 and a \$400 special assessment.

Case #11: Computers (New World Transtechnology)

On December 20, 1996, New World Transtechnology (NWT), Galveston, Texas, pleaded guilty to two counts of violating the International Emergency Economic Powers Act, and one count of making false statements. A criminal fine of \$10,000 was imposed and a special assessment of \$600 was levied against NWT. Courts alleged that NWT had exported three Sun Microsystems computers to a nuclear equipment factory located in the China in August 1992, without the required export license. It was also alleged that, in October 1992, NWT attempted to illegally export a computer to the same destination in China. Export Enforcement Special Agents seized another computer before it could be shipped to China via Hong Kong.

Case #12: Hafnium (Well Complex International)

Well Complex International pleaded guilty in March 1998 to a one-count federal indictment in U.S. District Court for failing to obtain the required Department of Commerce export license when it exported hafnium granules to China in 1996. The company's president, David Chan, also pleaded guilty to one charge of causing a false statement.

