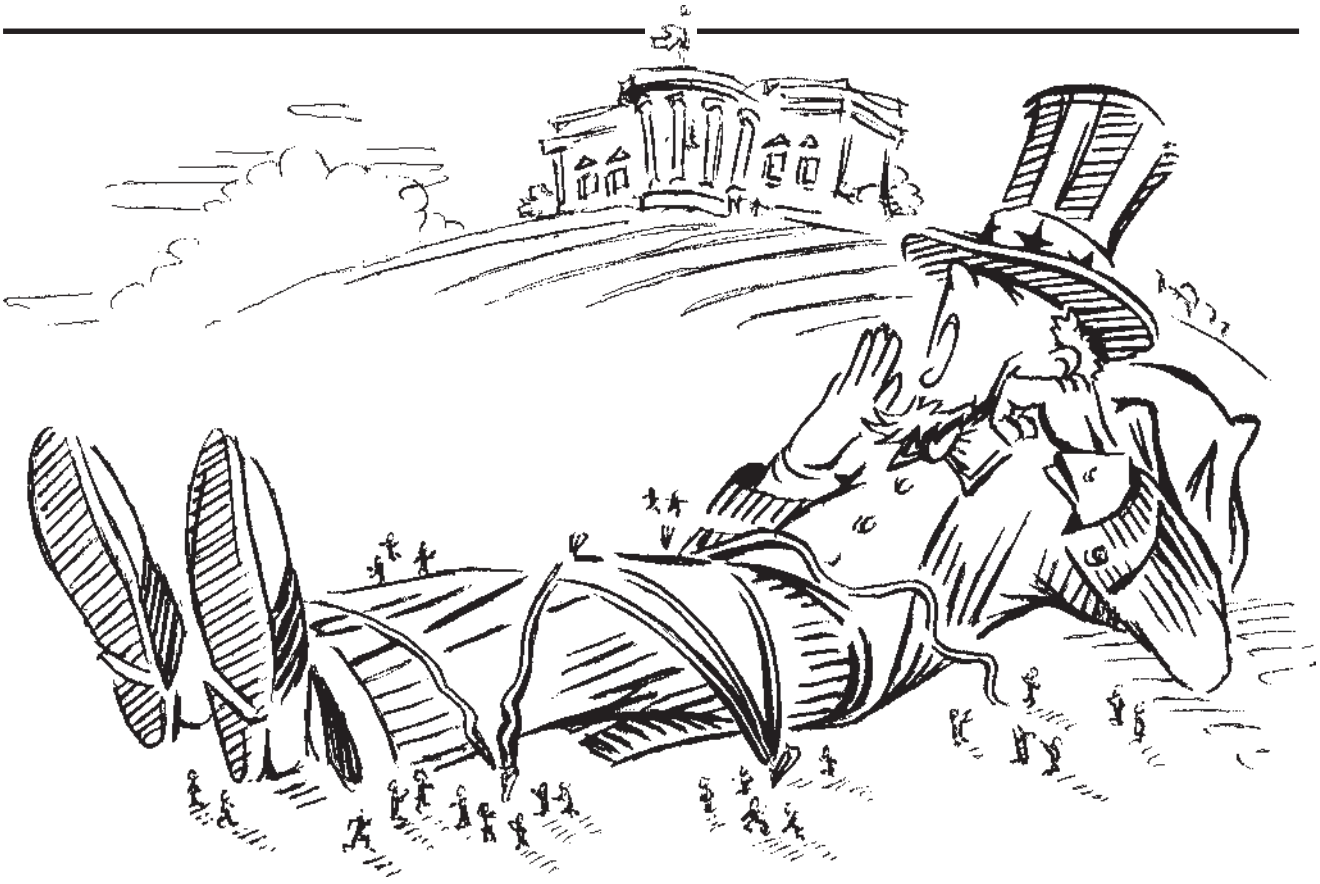
The Proliferation Primer

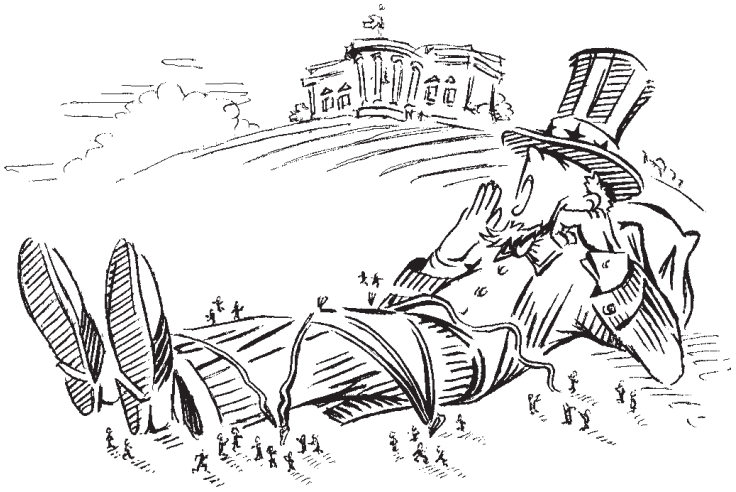


A Majority Report of the Subcommittee on
International Security,
Proliferation, and Federal Services

Committee on Governmental Affairs

United States Senate

January 1998



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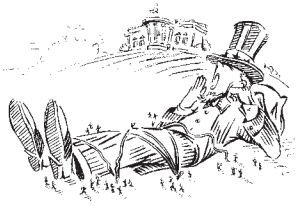

The Proliferation Primer

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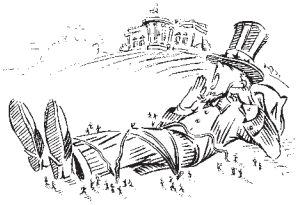


The Proliferation Primer

Introduction

On November 12, 1997, President Clinton extended his 1994 Executive Order finding "…that the proliferation of nuclear, biological, and chemical weapons ('weapons of mass destruction') and of the means of delivering such weapons, constitutes an unusual and extraordinary threat to the national security, foreign policy, and economy of the United States…[and] declare[d] a national emergency to deal with that threat." Then, on November 14, 1997, the President called for action "…in the face of what I consider to be one of three or four most significant security threats that all of our people will face in the next whole generation, this weapons of mass destruction proliferation. We've got to stop it." On November 23, 1997, during an appearance on *Meet the Press*, Secretary of Defense William Cohen added, "we have a [proliferation] threat that's out there, it's growing."

By speaking loudly but carrying a small stick the Clinton Administration risks its nonproliferation credibility and America's security.

These are strong words that suggest the need for strong action. To carry on business as usual could make the problem more serious by emboldening proliferators. By speaking loudly but carrying a small stick the Clinton Administration risks its nonproliferation credibility and America's security.

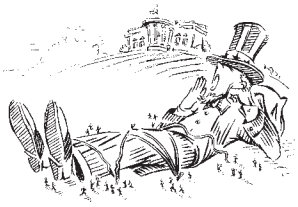
This *Proliferation Primer* discusses proliferation by the major suppliers of weapons of mass destruction technology, missile delivery systems, and key enabling technologies by examining cases in the public record.

It includes evidence that implicates Russia, China, and North Korea, and it questions the current responses of the Clinton Administration to deal with the realities of proliferation and to assure the protection of America's interests.

The *Proliferation Primer* compares the Wassenaar Arrangement to its predecessor export control regime, COCOM, assessing whether the elimination of COCOM has given rogue nations and their suppliers increased access to the technology of the West. It also considers the consequences of the Clinton Administration's new policies that limit the controls over the export of dual-use technology, such as supercomputers.

The *Primer* examines the increasing availability of missile hardware and expertise and discusses the difficulties of predicting when and how technological advances will occur.

The United States, like Gulliver, is a giant vulnerable to smaller nations. But unlike Gulliver, who was tied down while blissfully unaware of his surroundings, our government knows the new dangers presented by the world's rogue regimes. Now is the time to take decisive action to protect ourselves from the proliferation of weapons of mass destruction and their delivery systems.



China

China is the principal supplier of weapons of mass destruction and missile technology to the world,[1] and U.S. government efforts to turn Beijing against international proliferation have met with little success.

Since taking office in 1993, the Clinton Administration has engaged in numerous discussions with senior Chinese officials to persuade them to adhere to international nonproliferation norms. The Administration has also agreed to implement a nuclear cooperation agreement that was reached with China in 1985 for a Chinese pledge of no new Iranian nuclear sales and an assurance to adhere to its pledge of nonassistance to nuclear facilities not under International Atomic Energy Agency (IAEA) safeguards in Pakistan and other nations. But there has been a reluctance to impose sanctions under several U.S. laws that require them when supported by fact.

Several U.S. Senators have criticized the failure of our government policies and statutes to produce results.[2] Both the Chairman and ranking minority member of this subcommittee, Senator Thad Cochran and Senator Carl Levin, have expressed concerns that past responses by the Administration have been ineffective,[3] and Senator Richard Lugar has said, "[t]he Administration is showing a poverty of imagination in its responses to the Chinese."[4]

Transfer of M-11 Missiles to Pakistan

Since the early days of this decade, M-11 short-range ballistic missile (SRBM) and production technology transfers from China to Pakistan have been a popular press topic. Press reports on Chinese sales of M-11 missiles to Pakistan surfaced in the *Wall Street Journal* in April of 1991.[5] Later that same month the *Washington Post* reported that U.S. intelligence agencies had spotted a number of launch vehicles for the M-11 in Pakistan.[6] The M-11 is a modern, solid-fuel, surface-to-surface missile more accurate, mobile, and easier to fire than the Scuds used by Iraq in the Gulf War. Its presence in Pakistan along with its production technology is problematic as it can be armed with nuclear warheads.[7]

This is one of two China proliferation cases where U.S. sanctions have been imposed, in June of 1991 and again in August of 1993.[8] In both instances, M-11-related sanctions were later waived, in March of 1992 and October of 1994, respectively, after Chinese promises to adhere to the Missile Technology Control Regime (MTCR). The MTCR is a voluntary arrangement under which the 29 member nations agree to restrict exports of ballistic missiles capable of carrying a payload of at least 500 kilograms to a range of at least 300 kilometers, as well as key missile components and technology, to nonmembers of the regime. It contains no sanctions mechanism even for violators who are members.

Subsequent to the *Wall Street Journal* and *Washington Post* reports, the Bush Administration imposed sanctions effective in June of 1991 on two government-owned Chinese companies: the China Great Wall Industry Corporation (China's satellite launch company) and the China Precision Machinery Import-Export Corporation, which produces the missile. The sanctions denied licenses for the export of U.S. satellites, missile technology and equipment, and high-speed computers to China.

Secretary of State James Baker went to China in November of 1991 to resolve proliferation problems, among other issues. During the visit Chinese officials agreed to abide by the MTCR guidelines, and later sent this commitment to the United States in writing.

In return, the U.S. waived sanctions in March of 1992.[9] Nine months after the waiver, the *Los Angeles Times* reported China's violation of the commitment.[10] Its December 4, 1992 article reported that, according to unnamed U.S. intelligence officials, China during the previous two weeks had delivered about two dozen M-11's to Pakistan through the port of Karachi. The former Pakistani Chief of Army Staff, Mirza Aslam Beg, also admitted to Pakistan's purchase of M-11's from China, but said the missiles were not nuclear capable.[11]

Citing a growing body of evidence, in August of 1993 the Clinton Administration imposed sanctions on Pakistan's Ministry of Defense and 11 Chinese defense

and aerospace entities for violations of Category 2 of the MTCR.[12] Category 1 covers transfers of complete missile systems, key components such as complete missile stages, and some production equipment, while Category 2 regulates transfers of specific missile components and dual-use goods used to produce missiles.

Shortly after the imposition of sanctions, the *Washington Times* quoted State Department and intelligence sources as saying that despite "...overwhelming intelligence evidence that China in November of 1992 shipped Pakistan key components of its M-11 missile" — an MTCR Category 1 violation — Secretary of State Christopher decided China had only committed a Category 2 violation and imposed the mildest form of sanctions possible. Under Secretary of State Lynn Davis defended the decision, saying the U.S. did not have conclusive evidence Pakistan had received complete M-11's.[13]

In October of 1994 the U.S. waived these sanctions, too, in return for another Chinese promise not to export "ground-to-ground missiles" which are "inherently capable" of delivering at least 500 kilograms to at least 300 kilometers. China and the U.S. also reaffirmed their commitments to the "guidelines and parameters of the MTCR," although America's commitment to the MTCR was never in question.[14]

Since the waiver, a steady stream of press reports have disclosed intelligence information describing Chinese transfers of M-11's and continued assistance to Pakistan. The *Washington Post* reported that satellite reconnaissance photographs, intercepted communications, and human intelligence reports suggest that Pakistan has had more than 30 M-11's since November of 1992.[15]

The M-11's are reportedly stored at Pakistan's Sargodha Air Force Base west of Lahore, where the Pakistani military has constructed storage sheds for the missiles and mobile launchers, as well as related maintenance facilities and housing for launch crews.[16] Soldiers have also been sighted practicing simulated launches with advice from visiting Chinese experts.[17]

The *Post* reported in June of 1996 that all U.S. intelligence agencies believe with "high confidence" that Pakistan has obtained M-11 missiles and that Islamabad had probably finished developing nuclear warheads for them.[18] An August of 1996 *Washington Post* article further disclosed a classified National Intelligence Estimate concluded Pakistan was capable of an M-11 launch within 48 hours. It also confirmed Pakistan was constructing a factory to produce complete M-11's or their major components from Chinese-supplied blueprints and equipment.[19] According to the *Washington Times*, evidence of M-11's in Pakistan includes photographs of missile canisters. Yet the State Department, noting the presence of specifically designed M-11 canisters, ruled there was no proof they held M-11's.[20]

Nuclear Cooperation with Pakistan

China's ballistic missile trade with Pakistan is only one element of a broader relationship with Islamabad, which also includes a wide range of nuclear assistance since at least the early 1980's. This assistance reportedly includes aiding with construction of a research reactor, the provision of the design for a 25-kiloton implosion device, and enough weapon-grade uranium for two nuclear weapons.[21] Immediately before acceding to the Nuclear Nonproliferation Treaty (NPT) in 1992, China concluded a $500 million deal to construct a 300 megawatt nuclear reactor in Chasma, Pakistan.

The NPT prohibits exports of nuclear materials, non-nuclear equipment, or materials "...especially designed or prepared for use in..." producing nuclear materials to unsafeguarded facilities in non-nuclear weapon states.[22] Pakistan has agreed to place the Chasma facility under those safeguards, but has refused to accept IAEA full-scope safeguards of its entire nuclear program. Although China acceded to the NPT in 1992, it has refused to join the Nuclear Suppliers Group (NSG), the voluntary, multilateral 31 nation effort to harmonize and strengthen export controls of nuclear suppliers. Members of the NSG agree to restrict exports of dual-use and specially designed and prepared nuclear equipment and facilities to only those nations which accept IAEA monitoring of all facilities and nuclear materials.

China announced in September of 1997 its implementation of an export licence system for specialized nuclear equipment, as well as its intent to regulate exports of dual-use goods. According to Chinese Ambassador Li Changhe, these dual-use export regulations will be in place by mid-1998.[23] Establishment of an export control system and membership in the Zangger Committee

are two of five conditions the Clinton Administration has placed on implementation of the 1985 U.S.-China Nuclear Cooperation Agreement.[24] Although Beijing has refused to join the NSG, it joined the Zangger Committee as a full member in October of 1997.[25] The differences between the NSG and Zangger are important. While the Zangger Committee is similar to the NSG in restricting exports of nuclear and dual-use equipment, it allows exports to any facility under IAEA safeguards, even in countries with unsafeguarded nuclear facilities. The NSG is more restrictive because it requires that all nuclear facilities in the recipient country be under IAEA safeguards. It is noteworthy that China refuses to require its nuclear customers to accept these full-scope safeguards.

While not a declared nuclear state, Pakistan is a generally acknowledged possessor of nuclear weapons. In 1992, Foreign Secretary Shahryar Khan was interviewed by the *Washington Post* and acknowledged Islamabad had the components and know-how to assemble at least one nuclear explosive "device," the first public confirmation of the extent of Pakistan's nuclear program by a Pakistani official.[26]

During the interview, which he said was intended to set the record straight and identify the barriers to resumption of U.S. aid, Khan said his country had "...elements which, if put together, would become a device."[27] He confirmed that these elements included weapon "cores" made from highly enriched uranium, a fissile material used in nuclear weapons.

Only a month before the Khan revelations, CIA Director Robert Gates had given a detailed public description of the Pakistani nuclear program, testifying, "...we have no reason to believe that either India or Pakistan maintains assembled or deployed nuclear bombs. But such weapons could be assembled quickly, and both countries have combat aircraft that could be modified to deliver them in a crisis."[28] While Khan, in his *Post* interview, professed ignorance as to the number of nuclear devices his country could assemble from existing components, the *Los Angeles Times* cited a U.S. intelligence assessment concluding Pakistan then had enough material to make up to 10 nuclear weapons.[29]

China has helped Pakistan's nuclear program in other ways as well. In early 1996, the Clinton Administration evaluated intelligence reports indicating China had supplied ring magnets to a Pakistani nuclear facility, apparently in violation of the NPT.

On February 5, 1996, the *Washington Times* cited intelligence reports indicating that China had transferred 5,000 ring magnets to the A.Q. Khan Research Laboratory in Kahuta, Pakistan. Intelligence experts were said to believe the magnets were for special suspension bearings at the top of a rotating cylinder in gas centrifuges used exclusively for uranium enrichment.[30] The facility in Kahuta, named after the father of Pakistan's nuclear weapons program, is not under IAEA safeguards.[31]

According to the Washington Times, *evidence of M-11's in Pakistan includes photographs of missile canisters. Yet the State Department, noting the presence of specifically designed M-11 canisters, ruled there was no proof they held M-11's.*

Three months later the *New York Times* followed up with a story dating the shipment as later than June of 1994, and pricing it at $70,000.[32] The state-owned exporter, the China Nuclear Energy Industry Corporation, is a wholly-owned subsidiary of the China National Nuclear Corporation, a firm under the direct control of the State Council, whose head is China's Premier.[33]

On May 11, 1996, the State Department announced sanctions would not be levied against China or Pakistan for the ring magnet transfer, citing a new agreement under which Beijing agreed not to assist unsafeguarded nuclear facilities.[34] In testimony before the Senate, Deputy Assistant Secretary of State for Nonproliferation Robert Einhorn said the Administration was unable to determine that China's senior-most leaders had approved the sale. Mr. Einhorn added the Administration was therefore unable to make a finding the sale required sanctions under U.S. law, since it was unable to conclude that it constituted "...a willful aiding or abetting of Pakistan's

unsafeguarded nuclear program by the government of China."[35] The China Nuclear Energy Industry Corporation is, however, owned by the Chinese government.

President Clinton, in a press conference only a few weeks later, seemed to contradict Mr. Einhorn when he said, "I would remind you that when we had clear evidence that China was providing ring magnets to Pakistan in ways that we thought were plainly violative of our law and our national interest, we dealt with them about that and were satisfied. I think it's fair to say that on these issues, we will make appropriate determinations and take appropriate action."[36]

In addition to being "plainly violative" of U.S. law, the ring magnet sale also violated the NPT. Professor Gary Milhollin, Director of the Wisconsin Project on Nuclear Arms Control, explained: "These [ring magnets] are specialized items. We are not talking about dual-use equipment. We are talking about magnets that are made specifically to go into centrifuges that make enriched uranium for bombs. Those were sold by an arm of the China National Nuclear Corporation, which is an arm of the Chinese government. This was a sale by a Chinese government organization directly to a secret nuclear weapon-making facility in Pakistan of items that were specifically designed to help make nuclear weapon material. In my opinion, it violated China's pledge under the Nuclear Nonproliferation Treaty, which China signed in 1992. The treaty says that if you export something like that, you have to export it with international inspection. China did not."[37]

In testimony to the House International Relations Committee in June of 1996, Under Secretary of State Lynn Davis made a similar assessment, saying China's ring magnet sale was "...not consistent with their obligations as a party to the Nonproliferation Treaty."[38] Furthermore, the 1997 Defense Authorization Act (public law 104-201) found the Chinese company involved in this sale "...has knowingly transferred specially designed ring magnets to an unsafeguarded uranium enrichment facility in the Islamic Republic of Pakistan," and that the magnets are controlled by the NSG "...as a component of magnetic suspension bearings which are to be exported only to countries that have safeguards of the IAEA over all of their nuclear materials."[39]

Mr. Einhorn testified that the Administration believed China had complied with its latest nuclear nonproliferation commitment, and while the U.S. had "...raised concerns about certain activities, we have no basis to conclude that China has acted inconsistently with its May 11 undertaking [not to assist unsafeguarded nuclear facilities]."[40] Reports, however, have surfaced over the past year suggesting Beijing continues to equip and assist Pakistan's nuclear program.

On October 9, 1996, the *Washington Times* quoted a CIA report of September 14, 1996, describing the Chinese sale of a "special industrial furnace and high-tech diagnostic equipment" to Pakistan. The furnace and diagnostic equipment are dual-use items useable in melting plutonium and uranium for nuclear weapons.

The *Times* also disclosed a State Department diplomatic note to China protesting the sale of the equipment to "unsafeguarded nuclear facilities in Pakistan."[41] The CIA report concluded the sale was probably arranged by the China Nuclear Energy Industry Corporation, the vendor of ring magnets to Pakistan, and that senior-level government approval was most likely needed for the transaction to have occurred.

The *Washington Post* disclosed on October 10, 1996, China's response to the American complaint. The equipment, it explained, was delivered in late 1995 or early 1996, before their pledge not to assist unsafeguarded facilities. Quoting unnamed U.S. officials, the *Post* said the intelligence community had confirmed this account and added the equipment was apparently delivered to a nuclear reactor under construction by Pakistan at Khushab, which is also not under IAEA safeguards.[42] While it appears this transfer occurred prior to May of 1996 and therefore does not constitute a violation of China's May 11, 1996 nonproliferation pledge, it is another example of China's willingness to engage in nuclear proliferation in violation of its NPT obligations.

Even the Arms Control and Disarmament Agency's annual report to Congress did not state China had fully complied with its May 11, 1996 agreement not to provide nuclear assistance to unsafeguarded facilities. Instead, it noted that while the Administration could not yet stipulate a violation, "...questions remain about contacts between Chinese entities and elements associated with Pakistan's nuclear weapons program."[43]

Sale of Anti-Ship Cruise Missiles to Iran

Another Chinese sale to Iran, this time of an advanced conventional weapon system, the C-802 anti-ship cruise missile, poses a threat to U.S. forces in the Persian Gulf. The missile has a range of 120 kilometers with a 165 kilogram warhead and is especially lethal due to its over-the-horizon capability.[44] In 1987 a single Exocet cruise missile killed 37 sailors on the USS Stark.

Iran's possession of the missile was first disclosed in January of 1996 by Vice Admiral Scott Redd, then-commander of the U.S. Fifth Fleet. Redd said the C-802 gave the Iranian military increased firepower and represented a new dimension to the threat faced by the U.S. Navy, stating, "[i]t used to be we just had to worry about land-based cruise missiles. Now they have the potential to have that throughout the Gulf mounted on ships."[45] In addition to land and sea-based platforms, Iran can also launch the C-802 from air-based platforms.[46]

The latest open source estimate is that Iran has about 40 C-802's, but this was reported in March of 1996.[47] It is unclear from open sources how many additional C-802's China has supplied since then.

Late in 1995, according to the *Washington Times*, Pentagon officials recommended declaration of a Chinese violation of the Gore-McCain Iran-Iraq Arms Nonproliferation Act of 1992, which requires sanctions for the transfer to either country of "...destabilizing numbers and types of advanced conventional weapons..." Yet State Department officials, including Under Secretary Lynn Davis, opposed invocation of sanctions to avoid damaging relations with China.[48]

In Senate testimony, Mr. Einhorn acknowledged the transaction, saying, "...the question of whether China transferred the C-802 anti-ship cruise missiles to Iran is not in doubt."[49] He further noted, "[s]uch missiles increase China's maritime advantage over other Gulf states, they put commercial shipping at risk, and they pose a new threat to U.S. forces operating in the region."[50]

In its annual report, *Worldwide Maritime Challenges*, published in March 1997, the Office of Naval Intelligence discussed the implications of Iran's acquisition of C-802 missiles and Houdong patrol boats, stating, "...equipped to carry the Chinese C-802 antiship cruise missile, the Houdongs pose a significant threat to shipping in the Persian Gulf."[51] The report added that the C-802 missiles, in concert with Kilo submarines acquired from Russia, provide Iran "...with a capability to threaten naval forces and merchant shipping in the Persian Gulf and affect passage through the Strait of Hormuz. Iran's ongoing acquisitions of conventional arms and weapons of mass destruction (WMD) contribute to continual instability in the Persian Gulf."[52]

Despite his concern over Iran's new missiles, Mr. Einhorn defended the Administration's anti-sanction position, claiming no violation of Gore-McCain given the lack of "...destabilizing numbers and types..." of missiles.[53] Former U.S. Ambassador to China James Lilly disagreed, testifying there was "...no question that the sale of these missiles is under central control and it violates our law."[54] He went on to note that Iran's possession of C-802 missiles poses a "...clear and present danger to the United States fleet."[55] Ambassador Lilley also decried Administration inaction, saying of its response, "[t]ell that to our sailors and airmen in the Persian Gulf who are aware the Iranians now have facing our ships [C-802] launch vehicles for mobility and numerous caves for shelter and concealment along the coast."[56]

Prior to Chinese President Jiang Zemin's 1997 visit to the United States, press reports indicated Foreign Minister Qian Qichen had assured Secretary Albright Beijing would stop cruise missile sales to Iran. But the Administration has refused to confirm these reports.[57] On October 18, 1997, State Department spokesman James Rubin said, "Secretary Albright has raised in all her meetings with the Chinese foreign minister our deep concerns about the sale of conventional weapons and cruise missiles to Iran. I have no comment on his response."[58]

Chemical and Biological Sales to Iran

Chinese sales of equipment and precursor chemicals to Iran for their chemical and biological warfare programs have attracted considerable press coverage. In March of 1996, the *Washington Post* reported that Chinese companies were providing Iran with virtually complete factories suited for making chemical weapons (CW).[59] For more than a year, the U.S. reportedly monitored a steady flow of Chinese chemical-related equipment to Iran, where it

was installed in factories ostensibly for commercial-use chemicals. The equipment included glass-lined vessels suited for mixing caustic CW precursors and air filtration equipment. Iran reportedly also purchased Chinese technology to manufacture these and other items. The *Post* reported that unnamed Administration officials said Chinese firms had sold precursor chemicals to Iranian organizations affiliated with the military or the Revolutionary Guards, and the U.S. had "clear indicators" the chemicals were not for legitimate products.[60] China also delivered nearly 400 metric tons of chemicals — including carbon sulfide used in the production of nerve agents — to Iran in mid-1996, according to the *Washington Times*.[61]

On January 24, 1997, the *Washington Times* reported that in written responses to the Senate Foreign Relations Committee, Secretary Albright indicated Chinese companies sold equipment to Iran that could boost its biological weapons (BW) program. An unnamed U.S. intelligence official was quoted to the effect that the transfer involved equipment and vaccines with applications for civilian medical research as well as biological weapons.[62]

According to the *Wall Street Journal*, Iran has the largest CW stockpile in the Third World.[63] In 1995, Gordon Oehler, Director of the CIA's Nonproliferation Center, testified to the Senate that, "Tehran continues to upgrade and expand" its ability to produce and use CW and "is spending large sums of money on long-term capital improvements...which tells us that Tehran fully intends to maintain a chemical weapons capability well into the future."[64] In 1996, a Defense Department study concluded Iran also has a large BW program which began in the early 1980's and is capable of producing many different biological weapons.[65]

Although the Administration praised China for signing the Chemical Weapons Convention in 1993 and formally ratifying the treaty on May 4, 1997, it imposed sanctions in May of 1997 on two Chinese companies, five Chinese executives, and a Hong Kong firm for knowingly assisting Iran's chemical weapons program. The Chinese companies were the Nanjing Chemical Industries Group and an affiliated trading company, the Jiangsu Yongli Chemical Engineering and Technology Import/Export Corporation.[66] According to the *New York Times*, the five executives worked for other firms, but acted individually to sell CW-related items to Iran.[67] The Hong Kong company, Cheong Yee Ltd., was reportedly penalized for facilitating transactions between Chinese companies and Iranian authorities.

The Chinese companies, now banned from trading with the United States, are not state-owned, although it is unclear if their executives have hidden relationships with the Chinese government or military, as many Chinese firms do. The sanctioned companies reportedly conduct business worth about $2 million a year with the U.S. Since this is but a fraction of their total sales, these sanctions are hardly onerous.

...the Subcommittee's April 10, 1997 hearing on Chinese proliferation sheds light on "...an area where I think we have not lived up fully to our own domestic requirements in terms of the imposition of sanctions where evidence is plenty clear, or clear enough for me, at least."

– Senator Carl Levin

The sanctions were the first on Chinese entities for CW-related transfers and were imposed under the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991, a law forbidding companies from exporting a variety of chemicals and equipment to countries identified by the U.S. as state sponsors of terrorism. Under this law, the sanctions are imposed for one year, after which the Administration can either waive or continue them.

Sales of Missile Technology to Iran

During the last few years several published reports have described transfers of Chinese missile technology to Iran, MTCR pledges notwithstanding. Citing a CIA report, on June 23, 1995, the *New York Times* reported delivery of "dozens, perhaps hundreds, of missile guidance systems and computerized machine tools to Iran."[68] These components, it said, could improve the accuracy of North Korean-supplied Scuds and enable it to build more on its

own. The article quoted John Holum, Director of the Arms Control and Disarmament Agency: "There are substantial indications of continued missile-related transactions to [Iran]," and "...we are in a position where we have to consider the question of sanctions."[69]

In November of 1996, the *Washington Times* disclosed a CIA report titled "Arms Transfers to State Sponsors of Terrorism" which said the China Precision Engineering Institute had agreed to sell Iran's Defense Industries Organization gyroscopes, accelerometers, and test equipment, for building and testing missile guidance components.[70]

In the wake of the initial *New York Times* article, State Department spokesman Nicholas Burns said the U.S. was looking closely at the allegations, but had not determined whether China had violated previous commitments or U.S. law.[71] In written statements to Representative Gerald Solomon in June of 1997, seven months after Mr. Burns' remarks and two years after Director Holum's, Secretary of State Albright indicated the Administration was still "reviewing carefully" reports of missile-technology transfers to Iran, but had not decided whether the sales met the legal threshold requiring sanctions.

On June 17, 1997, the *Washington Times* revealed that according to a classified Pentagon intelligence report, Iran, with Chinese assistance, was developing a new short-range ballistic missile.[72] The joint program reportedly involves the development of the NP-110 solid-propellant missile with a range of 105 miles. According to the *Times*, "Iranian missile technicians traveled to China [in May of 1997] to watch a ground test of a 450 mm-diameter rocket motor to be used in the NP-110." In addition, China reportedly agreed to sell Iran X-ray equipment to study missile casings and to check for defects in solid-propellant, and has supplied telemetry equipment which sends and collects missile guidance data during flight tests.[73]

Finally, an unclassified report to Congress from the Director of Central Intelligence, reflecting the consensus view among U.S. intelligence agencies, noted "[t]he Chinese provided a tremendous variety of assistance to both Iran's and Pakistan's ballistic missile programs [in 1996]."[74]

In testimony in April of 1997, Mr. Einhorn said while the Administration did not believe China had exported complete missiles since 1994, "...concerns about transfers of missile components and missile technology persist, raising serious question about the nature of China's commitment to abide by the MTCR guidelines. At a minimum, the Chinese do not appear to interpret their responsibilities under the guidelines as restrictively as we do, or as other MTCR members do."[75]

Nuclear Cooperation with Iran

As any nuclear technology can be used to build scientific and technical infrastructure for nuclear weapons programs, the U.S. has urged China and other nations not to sell it to Iran. But the U.S. response is complicated by the fact that "peaceful" nuclear energy projects are allowed under the NPT, to which both China and Iran are parties. Nuclear weapon program advances by Iraq and North Korea, both NPT members, raise serious questions about the treaty's effectiveness.

For years, despite U.S. concerns, China has continued its nuclear cooperation with Iran. In September of 1992, China and Iran finalized an agreement on "nuclear energy" cooperation when President Rafsanjani visited Beijing accompanied by top-level military and atomic energy officials. China reportedly agreed to build two 300 megawatt nuclear reactors in about ten years in Iran.[76] This deal, however, appears to be on hold. In April of 1997, Deputy Assistant Secretary Einhorn testified, "[i]n 1995, China suspended the sale of two nuclear power reactors to Iran, probably as a result of siting and financing difficulties."[77]

There are other questionable Chinese nuclear deals with Iran. The China Nuclear Energy Industry Corporation has reportedly agreed to sell Iran a facility to convert uranium ore into uranium hexaflouride gas, which can be enriched to the weapons-grade level.[78] In Senate testimony, Professor Gary Milhollin criticized Chinese leaders for the sale of this facility to Iran, stating, "[t]here is no peaceful use for enriched uranium in Iran. Enriched uranium is used to fuel reactors, but the only reactors in Iran that could use such fuel are being supplied by Russia, which is also supplying their fuel. The conclusion has to be that Iran wants to use this plant to make atomic bombs. The fact that China is even considering this deal shows that China is quite ready to put nuclear weapon-making capability into the hands of what the United States regards as a terrorist nation." [79]

China has reportedly also agreed to sell Iran a zirconium production plant and a zero-power research reactor.[80] The zirconium plant is a key nuclear fuel cycle facility, used to produce a special metal sheath, zirconium cladding, for nuclear fuel rods used in reactors. Zirconium is listed as a controlled item by the Nuclear Suppliers Group. U.S. export control law bans sales from the United States without a validated license, and U.S. Customs agents have been involved in enforcement actions to prevent this from occurring. The zero-power research reactor, under construction for several years at Iran's Esfehan nuclear center, will not generate power. While the reactor will not use enriched uranium or produce significant amounts of plutonium, it will enable Iran to conduct nuclear research and train technicians. [81]

According to Administration officials, during October 1997 summit preparations, Beijing agreed to cancel the uranium conversion facility contract and halt future nuclear sales to Iran in exchange for an American Presidential certification permitting implementation of the 1985 U.S.-China Nuclear Cooperation Agreement.[82] China reportedly agreed to make public statements and provide private written assurances it would not engage in future nuclear sales to Iran.[83]

Chinese officials, however, were unwilling to cancel contracts for the zero-power reactor or the zirconium production plant with Tehran. During President Jiang's visit to Los Angeles, Foreign Ministry spokesman Shen Guofang even denied Chinese nuclear cooperation with Iran and called assurances to the U.S. unnecessary. "The question of assurance does not exist," said Shen. "China and Iran currently do not have any nuclear cooperation."[84]

Conclusion

These case studies explain China's reputation as the world's foremost proliferator of weapons of mass destruction and missile technology. Efforts by the Clinton Administration have failed to halt China's dangerous sales of sensitive technology. The Administration has interpreted its obligations under the law very narrowly. Its reliance on more pledges from the Chinese at the October summit reminds us of Samuel Johnson's observation about his friend's remarriage as "the triumph of hope over experience."

The transfer of M-11's to Pakistan illustrates China's violation of its nonproliferation promises. Press evidence, especially the photographs of M-11 missile canisters — canisters specifically designed to transport M-11's — is compelling. U.S. intelligence agencies are confident Pakistan has obtained M-11's from China, and in August of 1996, a National Intelligence Estimate (NIE) — representing the consensus of the intelligence community — reportedly concluded that Chinese missile assistance was continuing.[85] Worse, the NIE concluded China is helping to construct an M-11 factory in Pakistan, making future M-11 missile transfers unnecessary.[86]

The Administration's reliance on more pledges from the Chinese at the October summit reminds us of Samuel Johnson's observation about his friend's remarriage as "the triumph of hope over experience."

Despite the evidential pattern, the Administration has not imposed sanctions. In Senate testimony, Mr. Einhorn said sanctions had not been invoked on China for the sale of M-11 missiles to China "...because our level of confidence is not sufficient to take a decision that has very far-reaching consequences."[87] But the Administration appears to have purposely set a standard of evidence so high as to be unattainable. Professor Milhollin suggested as much when he said, "I think the State Department just continues to raise the level over which you have to jump higher and higher as the evidence comes in so that sanctions will never have to be applied and the engagement policy can simply be continued. The effect is to really nullify the act of Congress that imposes sanctions, because unless the State Department is willing to go forward in good faith and complete the administrative process, then the law cannot take any effect."[88]

The ring magnet case is an example of an inventive legal interpretation to avoid sanctions under U.S. proliferation laws. Mr. Einhorn's suggestion of the absence of approval of China's most senior leaders required for a find-

ing of "...a willful aiding or abetting of Pakistan's unsafeguarded nuclear program by the government of China" shows how high the level of proof has been raised by the Clinton Administration.[89] While specific senior leaders in Beijing may or may not have been aware of the transaction, a Chinese government entity, the China Nuclear Energy Industry Corporation, clearly was.

The Administration's handling of the ring magnet problem raises two important issues that are threaded throughout all U.S. proliferation encounters with China. First, the Administration claims China's proliferation record remains problematic, but has improved in recent years. Beijing, however, steadfastly denies that a proliferation problem ever existed each time the United States announces resolution of a proliferation dispute. For instance, in February of 1996 a Chinese Foreign Ministry spokesman stated, "China is a responsible country. We have not transferred, nor will we transfer to any country, equipment or technologies used in manufacturing nuclear weapons."[90]

Secondly, Administration officials often claim China has provided clear assurances in private, but these statements are usually contradicted by Chinese public statements. After the "resolution" of the ring magnet dispute, Secretary of State Warren Christopher testified to Congress, "[l]ast week, we reached an understanding with China that it will no longer provide assistance to unsafeguarded programs. Senior Chinese officials have explicitly confirmed our understanding that the Chinese policy of not assisting unsafeguarded nuclear facilities would prevent future sales, future transfers of ring magnets."[91]

China, however, has never publicly acknowledged transferring ring magnets to Pakistan, and on the very same day as Christopher's testimony, China's Foreign Ministry spokesman said, "[b]eing a signatory of the Nuclear Non-Proliferation Treaty, China strictly abides by its treaty commitments and has never engaged in any activities in violation of its commitments. China's position of opposing nuclear weapons proliferation is constant and unambiguous. China will, as usual, continue to honor its international commitments and play a positive role in maintaining regional and world peace and stability."[92] These experiences lead us to question whether, in Secretary Albright's words, the Chinese "...have changed their *modus operandi*."[93]

President Clinton's statement at a June 1997 press conference that the ring magnet sale was "plainly violative" of U.S. law is an accurate interpretation of the statute. But, if the ring magnet sale was "plainly violative" of U.S. law, where are President Clinton's "appropriate determinations" and "appropriate action[s]"?

The advanced cruise missiles sold to Iran have increased Iran's maritime advantage over its neighbors and have increased the dangers to U.S. military forces in the region.[94] The refusal of the Administration to respond with sanctions on China for putting U.S. troops at risk from C-802's led the U.S. Senate to adopt a sense of the Senate resolution in protest.

In June of 1997, it passed an amendment by a vote of 96 to 0, saying, "[t]he delivery of cruise missiles to Iran is a violation of the Iran-Iraq Arms Non-Proliferation Act of 1992 (50 U.S.C. 1701). It is the sense of the Senate to urge the Clinton Administration to enforce the provisions of the [Act] with respect to the acquisition by Iran of C-802 model cruise missiles."[95]

Despite the Senate position, the Administration continues to maintain that C-802 sales are not "destabilizing." During testimony to the Senate Foreign Relations Committee on September 17, 1997, Assistant Secretary of State for East Asian and Pacific Affairs Stanley Roth claimed the C-802 sale "...does not have to be destabilizing if you define it as overturning the ability of the United States to operate in the Persian Gulf. It hasn't done that."[96] Mr. Roth added, "...the U.S. Navy tells us that despite the increased threat from the sale of cruise missiles, it can continue to operate and carry out its mission to the Persian Gulf. And so even though [the Navy] is exceedingly unhappy with this new development, it is not, on the face of it, destabilizing at this point."[97] Such thinking makes unimaginable what the Administration might find sufficiently destabilizing for sanctions under the Gore-McCain Act.

Another troubling characteristic of the Administration's response is the strategy of delaying a formal decision. When confronted with evidence of Chinese proliferation, Administration officials will say: "We take the allegations seriously, but a formal decision to impose or waive sanctions is a serious step that must be carefully considered." Over two years ago, ACDA Director Holum's reaction to "substantial indications" of Chinese missile assistance to Iran was, "...we are in a position where we have to consider the question of sanctions."[98] But, the

Administration has made no formal decision to impose them, perhaps hoping Congress, if not the military, would forget the problem.

In Senate testimony in April 1997, Professor Milhollin highlighted the Administration's inaction, stating, "I am told that last fall, the Executive Branch finished a number of studies on China's missile and chemical exports to both Iran and Pakistan. The studies contained the legal and factual analysis necessary to apply sanctions, but the studies have lain dormant since then. The State Department is now, in effect, choosing not to complete the administrative process. So the result is that the sanctions law is not achieving either deterrence or punishment as Congress intended."[99]

Senator Ted Stevens expressed frustration at the Administration's unwillingness to implement the law, stating, "I am coming to the conclusion that maybe the Administration is so narrowly interpreting our laws that we would have the situation that if a country moved a missile or a poison gas or bacterial warfare system piece by piece, grain by grain, you could not do anything about it until all the grains were there and then it would be a *fait accompli*."[100]

Implementation of U.S.-China Peaceful Nuclear Cooperation Agreement

During the October 1997 summit in Washington with Chinese President Jiang Zemin, President Clinton announced his intention to implement the 1985 U.S.-China Peaceful Nuclear Cooperation Agreement.[108] The accord was negotiated and signed during the Reagan Administration and permits U.S. companies to export nuclear technology to China. Its implementation stalled, however, due to a condition included in the 1985 Joint Resolution passed by Congress approving the agreement which requires the President to certify that China has taken steps "...represent[ing] sufficient progress toward terminating..." nuclear weapon-related assistance to any nation other than the five declared nuclear powers (i.e. Russia, China, France, the U.K., and the U.S.) before the agreement could take effect. No President has been able to make this certification in the last 12 years.

The Administration's rationale for certifying that China has taken steps "...represent[ing] sufficient progress toward terminating..." nuclear weapon-related assistance to non-nuclear weapons countries, thereby allowing the 1985 U.S.-China Nuclear Cooperation Agreement to proceed, is but the most recent example of its "hope over experience" nonproliferation policy toward China.

The Clinton Administration puts forward five actions by China justifying the certification necessary to implement the 1985 agreement. But questions remain on whether the actions are as significant as suggested.

- *Actions 1 and 2: Clear and unequivocal public assurances that China will not provide nuclear assistance to non-nuclear states, and private written assurances that China will not engage in new nuclear cooperation with Iran.* Foreign Ministry spokesman Guofang announced before President Jiang left the United States there was no need to provide assurances to the United States since "China and Iran currently do not have any nuclear cooperation," demonstrating that Beijing has not complied with either of these conditions.[109]

- *Action 3: Beginning to put export controls in place, including controls on dual-use items.* Chinese Ambassador Changhe stated at a Zangger Committee meeting in October 1997 that, "[r]elevant departments of China are stepping up their efforts to complete the export control regulations on the nuclear-related dual use items. The regulations will be completed by mid-1998."[110] This is something Beijing could do immediately if it chose.

- *Action 4: Adherence to China's May 11, 1996 pledge not to assist unsafeguarded nuclear facilities.*

(Continued on next page)

Something can be done about these transfers, and would be if the Administration did not refuse to take actions required under U.S. law. This lack of action is particularly troubling, as China's government knew of the transfers of WMD and missile technology to Iran and Pakistan and either approved the sales or refused to halt them. Mr. Einhorn admitted as much, saying, "China's problematic record on exports can largely be attributed to conscious decisions by Chinese leaders to pursue policies deemed to be in China's national interest. In the case of Pakistan this has involved decisions to bolster the defense capabilities of a close and long-standing friend against the perceived threat from India. In the case of Iran, there has probably been more of a mixture of foreign policy and commercial motivations."[101]

Occasionally the Administration does obey statutory sanctions requirements, but only symbolically, as with the *de minimus* sanctions imposed for the sale of chemical weapons materials and technology to Iran. Those sanctions were not applied to the Chinese government, but only on a handful of Chinese individuals and companies. That the actions met the bare requirements of U.S. law

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ACDA's 1996 Annual Report to Congress states, "...questions remain about contacts between Chinese entities and elements associated with Pakistan's nuclear weapons program," and the recent report to Congress by the Director of Central Intelligence says, "China also was the primary source of nuclear-related equipment and technology to Pakistan" in late 1996.[111]

- *Action 5: Membership in the Zangger Committee.* China has complied with this condition, attending its first meeting as a full member of the Zangger Committee on October 16, 1997. China has not, however, joined the Nuclear Suppliers Group (NSG), whose members adopt far more stringent export controls. While Zangger membership represents a slight step forward, NSG membership would mean more. Most other U.S. nuclear partners are members of the NSG, and none of the countries that are outside the NSG are of nuclear proliferation concern. The standard should not be lower for China.

During a summit-related Senate staff briefing, an Administration official said, "the question is whether they'll [the Chinese] live up to their assurances [on nuclear nonproliferation]."[112] Representative Lee Hamilton, the ranking member of the House International Relations Committee, stated recently, "[t]here is no question that Chinese behavior in non-nuclear areas — especially on missiles — is far from satisfactory. Much more progress is required and the administration needs to press China hard."[113] Hamilton noted further, "China's overall nonproliferation record of compliance leaves much to be desired."[114] As long as the Administration's reaction to China's proliferation is "it could be worse," the United States can expect its continuation.

When the Administration announced it would not impose sanctions on China for selling ring magnets to Pakistan, a senior State Department official told reporters the concession was warranted partly because China had promised no future transfers.[115] But when the Chinese government released a statement about the resolution of the dispute eight hours later, it was clear Beijing would not go that far. The Chinese statement referred neither to future sales of ring magnets, the heart of a four month dispute, nor to any pledge by Beijing to refrain from similar exports in the future.[116]

According to a *Washington Post* article on May 14, 1996, "China had refused repeated U.S. requests to make these pledges publicly. To cover the defect, Washington devised an unusual diplomatic stratagem: U.S. officials would say what they thought China meant to say in public, and the absence of any public Chinese protest would be taken as Beijing's assent."[117] China's refusal to give clear assurances and to comply fully with its commitments will remain routine as long as breeched promises and vague statements are accepted.

considerably minimized their impact. The *Washington Post* reported: "The sanctions announced yesterday will have minimal economic effect on China, officials said, because they are aimed at individuals and companies that do little business with this country."[102]

Secretary Albright defended the Administration's decision not to sanction the Chinese government, saying the U.S. had "...no evidence that the Chinese government was involved" in the CW-related sales to Iran.[103] But other Administration officials, including Mr. Einhorn, readily acknowledge the U.S. has, on many occasions, raised concerns about CW-related sales to Iran with the Chinese government. That government may or may not have formally approved chemical equipment sales to Iran, but government officials in Beijing knew of the transfers, if only because of the concerns expressed by U.S. officials. As Mr. Einhorn said in Senate testimony, China cannot take a "see no evil, hear no evil approach" to chemical exports; as a minimum, this approach should not be cost-free.[104]

> *" I am coming to the conclusion that maybe the Administration is so narrowly interpreting our laws that we would have the situation that if a country moved a missile or a poison gas or bacterial warfare system piece by piece, grain by grain, you could not do anything about it until all the grains were there and then it would be a* fait accompli*."*
>
> – Senator Ted Stevens

The imposition of sanctions should not be the first or only weapon used against proliferation, but it should not be allowed to rust from disuse. The United States can selectively use sanctions either to halt these deadly sales or at least raise costs to proliferators. On October 17, 1991, then-Senator Al Gore spoke on the Senate floor of the need for strong actions, such as sanctions, to combat proliferation. He urged governments around the world to make sales of sensitive technologies "...high crimes under each country's legal system, to devote the resources necessary to find those who have violated those laws or who are conspiring to violate them, and to punish the violators so heavily as to guarantee the personal ruin of those who are responsible, and to easily threaten the destruction of any enterprise so engaged."[105]

Senator Stevens said at a Subcommittee hearing, "I do not like to see charts like the one that we're looking at that indicate that we have had a series of instances and we have had no sanctions, no sanctions, no sanctions. Then you had sanctions and you lifted them within nine months. What does that say to China? It says that our laws are immaterial, really, in terms of our relationships."[106]

If the United States does not back its words with actions, China and other suppliers of weapons of mass destruction technology and delivery systems will view American statements of concern as meaningless rhetoric. Senator Stevens went on to observe, "I do not see any reason to be hasty in imposing sanctions. On the other hand, it seems to me that our relationships will deteriorate if we are not very strong in expressing our opinions and fulfilling our commitments to one another."[107] Just as sanctions cannot be the only tool for dealing with proliferation, neither can high-level discussions.

ENDNOTES

[1] Director of Central Intelligence Report to Congress, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions," June, 1997, p. 5.

[2] U.S. Congress, Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, Hearing on April 10, 1997, *China: Proliferation Case Studies*, 105th Cong., Sess. 1, 1997, p. 42. Hereafter cited as Hearing, *China: Proliferation Case Studies*, 1997. As Senator Thad Cochran stated during the hearing, "It is clear to me, and troubling at the same time, that the Administration's efforts have been ineffective." He further noted that China's sales of weapons of mass destruction and advanced conventional weapons had "made this a more dangerous world for us, particularly, and is a threat to the security of the United States."

[3] *Ibid.*, p. 23. Senator Carl Levin summarized the Administration's unmet legal obligations when he said during the Subcommittee's April 10, 1997 hearing on Chinese proliferation that it had shed light on "an area where I think we have not lived up fully to our own domestic requirements in terms of the imposition of sanctions where evidence is plenty clear, or clear enough for me, at least."

[4] "China Policy: Politics Rules," *New York Times*, April 29, 1997, p. A8.

[5] "Pakistan Seeks Chinese Missile, U.S. Believes," *Wall Street Journal*, April 5, 1991, p. A16.

[6] R. Jeffrey Smith, "Chinese Missile Launchers Sighted in Pakistan," *Washington Post*, April 6, 1991, p. A17.

[7] Jim Mann, "Arms Sale by China Breaks Vow," *Los Angeles Times*, December 4, 1992, p. A1.

[8] Shirley A. Kan, *Chinese Proliferation of Weapons of Mass Destruction: Background and Analysis*, Congressional Research Service, p. CRS-17.

[9] *Ibid.*, p. CRS-19.

[10] Mann, pp. A1, A18.

[11] "China Sold Pakistan M-11 Missiles: Former Official," *Agence France-Presse*, December 6, 1992.

[12] U.S. Department of State Dispatch, "China and Pakistan: M-11 Missile Sanctions," August 30, 1993, p. 607.

[13] Martin Sieff, "Slap on Wrist for Beijing, Missile Sales Draw Sanction from U.S.," *Washington Times*, August 26, 1993, p. A1.

[14] Kan, p. CRS-24.

[15] R. Jeffrey Smith and David B. Ottaway, "Spy Photos Suggest China Missile Trade; Pressure for Sanctions Builds Over Evidence Pakistan has M-11s," *Washington Post*, July 3, 1995, p. A1.

[16] *Ibid.*

[17] *Ibid.*

[18] R. Jeffrey Smith, "Report Cites China-Pakistan Missile Links," *Washington Post*, June 18, 1996, p. A19.

[19] R. Jeffrey Smith, "China Linked to Pakistani Missile Plant; Secret Project Could Renew Sanctions Issue," *Washington Post*, August 25, 1996, p. A1.

[20] Bill Gertz, "Pakistan Deploys Chinese Missiles," *Washington Times*, June 12, 1996, p. A14 and Bill Gertz, "China Nuclear Transfer Exposed; Hill Expected to Urge Sanctions," *Washington Times*, February 5, 1996, p. A1.

[21] Kan, p. CRS-28.

[22] U.S. Arms Control and Disarmament Agency, "Arms Control and Disarmament Agreements, Texts and Histories of the Negotiations," 1996 Edition, p. 72.

[23] "China implements nuclear export licence system," *Reuters*, September 15, 1997 and Zangger Committee, "Statement by Ambassador Li Changhe of the Chinese Permanent Mission in Vienna," p. 4.

[24] Briefing to Senate staff by senior administration officials, October 28, 1997.

[25] "Statement by Ambassador Li Changhe," p. 1.

[26] R. Jeffrey Smith, "Pakistan Official Affirms Capacity for Nuclear Device; Foreign Minister Vows to Contain Technology," *Washington Post*, February 7, 1992, p. A18.

[27] *Ibid*.

[28] *Ibid*.

[29] Mann, p. A1.

[30] Gertz, "China Nuclear Transfer Exposed," p. A1.

[31] R. Jeffrey Smith, "China Aids Pakistan Nuclear Program," *Washington Post*, February 7, 1996, p. A16.

[32] Steve Erlanger, "U.S. Won't Punish China Over Sale of Nuclear Gear," *New York Times*, May 11, 1996, p. A1.

[33] Kan, p. CRS-9.

[34] R. Jeffrey Smith and Thomas W. Lippman, "U.S. Relents On Chinese Sanctions," *Washington Post*, May 11, 1997, p. A24 and Smith, "China Aids Pakistan Nuclear Program," p. A16.

[35] Hearing, *China: Proliferation Case Studies*, p. 20.

[36] Transcript of President Clinton's press conference, *Washington Post*, June 23, 1997, p. A11.

[37] Hearing, *China: Proliferation Case Studies*, p. 31.

[38] U.S. Congress, House International Relations Committee, Hearing, *Review of the Clinton Administration Nonproliferation Policy*, 104th Congress, 2nd Sess., June 19, 1996, p.15.

[39] Fiscal Year 1997 Defense Authorization Act, Public Law 104-201, sections 1305 and 1306.

[40] Hearing, *China: Proliferation Case Studies*, p. 4.

[41] Bill Gertz, "Beijing Flouts Nuke-Sales Ban," *Washington Times*, October 9, 1996, p. A1.

[42] R. Jeffrey Smith, "China Sold Nuclear Items Before Vow," *Washington Post*, October 10, 1996, p. A38.

[43] United States Arms Control and Disarmament Agency Annual Report to Congress, "Threat Control Through Arms Control," 1996, p. 90.

[44] Bill Gertz, "Iran Obtains Patrol Boats from China," *Washington Times*, March 27, 1996, p. A12.

[45] Bill Gertz, "Pentagon Began Seeking Sanctions on China Months Ago," *Washington Times*, February 10, 1996, p. A6 and Bill Gertz, "Iran Obtains Patrol Boats from China," *Washington Times*, March 27, 1996, p. A1.

[46] General Peay, then commander of U.S. Central Command, commented in an interview in January of 1997 that China had also sold 20 Houdong fast-attack patrol boats, 15 of which are armed with C-802's to Iran. Bill Gertz, "U.S. Commander in Gulf Sees Increased Threat from Iran," *Washington Times*, January 29, 1997, p. A3. Ambassador Lilley testified at the Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services April 10, 1997 hearing that Iran had also mounted the C-802's on highly mobile truck-mounted launchers which could easily be concealed in caves. Hearing, *China: Proliferation Case Studies*, p. 24. In addition, during a five-nation tour of the Middle East in June of 1997, Defense Secretary William Cohen disclosed that the Iranian Air Force had conducted test launches of an air-launched version of the C-802 and warned the Iranian government not to consider disrupting seaborne trade in the Persian Gulf, stating, "Iran's words and actions suggest that it wants to be able to intimidate its neighbors and to interrupt commece in the Gulf. The United States will not allow this to happen." Robert Burns, "Defense Chief Warns Iran," *Associated Press*, June 18, 1997.

[47] Gertz, "Iran Obtains Patrol Boats from China," p. A1.

[48] Gertz, "Pentagon Began Seeking Sanctions on China Months Ago," p. A6.

[49] Hearing, *China: Prolferation Case Studies*, p. 14.

[50] *Ibid.*, p. 21.

[51] Office of Naval Intelligence Publication, "Worldwide Maritime Challenges 1997," March 1997, p. 21.

[52] *Ibid*.

[53] Hearing, *China: Proliferation Case Studies*, p 9.

[54] *Ibid.*, p. 25.

[55] *Ibid.*, p. 24.

[56] *Ibid.*, p. 28.

[57] Steven Erlanger, "U.S. Says Chinese Will Stop Sending Missiles To Iran; Nuclear Aid May End Too; Way Might Then Be Cleared for Sale of American Atomic Technology to China," *New York Times*, October 18, 1997, p. A1 and Laura Myers, "China promises to halt missile sales to Iran, U.S. official says," *Associated Press*, October 18, 1997.

[58] Myers, "China promises to halt missile sales to Iran, U.S. official says," *Associated Press*, October 18, 1997.

[59] R. Jeffrey Smith, "Chinese Firms Supply Iran With Gas Factories," *Washington Post*, March 8, 1996, p. A26.

[60] *Ibid*.

[61] Bill Gertz, "China sold Iran missile technology," *Washington Times*, November 21, 1996, p. A1.

[62] Bill Gertz, "Albright Concedes Concern Over China-Iran Transfers," *Washington Times*, January 24, 1997, p. A6.

[63] "Don't Forget About Iran," *Wall Street Journal*, September 23, 1996, p. A20.

[64] Smith, "Chinese Firms Supply Iran With Gas Factories," p. A26 .

[65] Department of Defense Publication, "Proliferation: Threat and Response," April 1996, p. 16.

[66] Steven Mufson, "China Demands U.S. Lift New Embargo," *Washington Post*, May 24, 1997, p. A25.

[67] Steven Lee Myers, "U.S., Asserting Iran Link, Bars 2 Chinese Firms," *New York Times*, May 23, 1997, p. A12.

[68] Elaine Sciolino, New York Times News Service, "China Targeted on Missile Exports," *International Herald Tribune*, June 23, 1995, p. 1.

[69] *Ibid*.

[70] Gertz, "China Sold Iran Missile Technology," *Washington Times*, November 21, 1996, p. A14 and Willis Witter, "U.S.: No Proof of Chinese Violations," *Washington Times*, November 23, 1996, p. A1.

[71] Gertz, "China Sold Iran Missile Technology," p. A14.

[72] "China Joins Forces with Iran on Short-range Missile," *Washington Times*, June 17, 1997, p. A3.

[73] Bill Gertz, "Russia, China aid Iran's missile program; Prototype expected within three years of weapon that could hit Central Europe," *Washington Times*, September 10, 1997, p. A1.

[74] DCI Report, p. 5.

[75] Hearing, *China: Proliferation Case Studies*, p. 9.

[76] Kan, p. CRS-33.

[77] Hearing, *China: Proliferation Case Studies*, p. 8.

[78] Jonathan S. Landay, "China to Halt Nuclear Deal with Iran, U.S. Officials Say," *Christian Science Monitor*, December 19, 1996, p. 1.

[79] Hearing, *China: Proliferation Case Studies*, p. 35.

[80] R. Jeffrey Smith, "China's Pledge to End Iran Nuclear Aid Yields U.S. Help; Clinton Says He'll Allow U.S. Exports of Technology; Scrutiny and Debate Are Expected," *Washington Post*, October 30, 1997, p. A1.

[81] *Ibid*.

[82] "U.S. Wants China Guarantee On Iran Nuclear Technology," *Dow Jones News Service*, October 14, 1997; John Pomfret, "U.S., May Certify China on Curbing Nuclear Exports," *Washington Post*, September 18, 1997, p. A1; Transcript of White House background press briefing by senior administration officials, October 29, 1997.

[83] Transcript of White House background press briefing by senior admnistration officials, October 29, 1997.

[84] Benjamin Kang Lim, "China says it has no nuclear cooperation with Iran," *Reuters*, November 3, 1997.

[85] Smith, "Report Cites China-Pakistan Missile Links," p. A19.

[86] Smith, "China Linked to Pakistani Missile Plant; Secret Project Could Renew Santions Issue," p. A1.

[87] Hearing, *China: Proliferation Case Studies*, p. 19.

[88] *Ibid.*, p. 32.

[89] *Ibid.*, p. 20.

[90] US. Congress, Congressional Record, 105th Cong., 1st Sess., 1997, p. H10073.

[91] *Ibid*.

[92] *Ibid*.

[93] Jim Hoagland, "A Foreign Policy That Asks, 'Can't We All Just Get Along?'," *Washington Post*, p. A23.

[94] Hearing, *China: Proliferation Case Studies*, p. 5. At the Subcommittee's April 10, 1997 hearing, "*China: Proliferation Case Studies*," Mr. Einhorn testified that C-802 "missiles increase Iran's maritime advantage over other Gulf states, they put commercial shipping at risk, and they pose a new threat to U.S. forces operating in the region."

[95] US. Congress, Congressional Record, 105th Cong., 1st Sess., 1997, p. S5737.

[96] Ernest Blazar, "Inside the Ring: The devil's dictionary," *Washington Times*, September 17, 1997, p. A6.

[97] *Ibid*.

[98] Sciolino, p. 1.

[99] Hearing, *China: Proliferation Case Studies*, p. 33.

[100] *Ibid.*, p. 21.

[101] *Ibid.*, p. 7.

[102] Thomas W. Lippman, "U.S. Imposes Sanctions on China Firms," *Washington Post*, May 23, 1997, p. A33.

[103] *Ibid*.

[104] Hearing, *China: Proliferation Case Studies*, p. 9.

[105] Congressional Record, 105th Sess. October 17, 1991, p. S14858.

[106] Hearing, *China: Proliferation Case Studies*, p. 13.

[107] *Ibid.*, p. 12.

[108] Smith, "China's Pledge to End Iran Nuclear Aid Yields U.S. Help; Clinton Says He'll Allow U.S. Exports of Technology; Scrutiny and Debate Are Expected," p. A15.

[109] Lim, "China Says It Has No Nuclear Cooperation with Iran."

[110] Statement by Ambassador Li Changhe, p. 4.

[111] "Threat Control Through Arms Control," p. 90, and DCI Report p. 5.

[112] Briefing for Senate staff by senior administration officials, October 28, 1997.

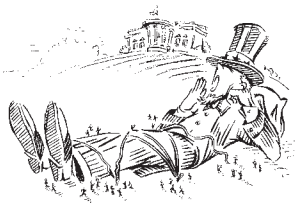
[113] Lee Hamilton, "We Mustn't Move the Bar on China Now," *Washington Post*, November 12, 1997, p. A23.

[114] *Ibid*.

[115] "China Silent on Nuclear Export Plans," *Washington Post*, May 14, 1996, pp. 1, 9.

[116] *Ibid*.

[117] *Ibid*.



Russia

Although China has earned the distinction as the world's most prolific supplier of ballistic missiles and weapons of mass destruction technology, in recent years Russia has become increasingly active as a supplier of these sensitive technologies.[1] The Russian government has agreed to sell nuclear reactors to Iran and India, and Russian defense and aerospace organizations have sold a variety of missile technology to Iran and Iraq.[2] Because Russia is a major supplier, its cooperation is essential if efforts to combat proliferation are to succeed.[3] As Deputy Assistant Secretary of State for Nonproliferation Robert Einhorn noted recently in Senate testimony, "Russia is clearly a key player in international efforts to prevent proliferation. Its cooperation is indispensable. Its failure to cooperate potentially is very harmful."[4]

Russia's sales of sensitive weapons technology occur amid great tumult in Russian society. Workers are sometimes paid months late or never, crime is rampant, and housing is insufficient. Hunger, draft evasion, poor training, and aging equipment plague the Russian military, which remains one of the world's largest.[5] Conditions in the Russian military are so bad that 314 soldiers reportedly committed suicide during the first nine months of 1997.[6]

Russia's premier defense facilities have not been immune to disruptions. Strategic missile facilities have suffered repeated power cutoffs in recent months due to unpaid electric bills. During late 1996, thieves reportedly often disrupted Strategic Rocket Forces communications to operational units on numerous occasions by mining copper and other metals from communications cables.

Despite the danger posed by transfers of sensitive technology to proliferators like Iran, Russia's cash-starved nuclear and defense industries have pursued such sales. It is unclear how much control central government officials have over these sales. Senior Russian officials have approved some deals, and Moscow appears unwilling or unable to halt others. As Mr. Einhorn noted in Senate testimony, "[t]he current situation in Russia, including powerful pressures to export, the evolving relationship between central governmental authorities and an increasingly privatized industrial sector, and a relatively new and unproven export control system has led to questionable exports in cooperation with some countries of proliferation concern, particularly Iran."[7]

President Clinton, Vice President Gore, and other senior Administration officials have held numerous discussions with Russian officials to persuade Moscow to adhere to international nonproliferation norms and to cancel questionable deals with countries of concern.[8] As a result, Russia agreed to join the MTCR and to restrict the scope of its nuclear cooperation with Iran.[9] Moscow also agreed to halt future sales of conventional arms, including ballistic missiles, to Iran, although reports indicate it has not complied with these agreements.[10]

In Senate testimony, Mr. Einhorn said the Administration's "...nonproliferation agenda with Russia will involve both incentives and disincentives, including the implementation of U.S. sanctions laws whenever applicable."[11] Thus far, however, the Administration has opposed Congressional initiatives to modify Russia's behavior by targeted sanctions and restrictions on foreign aid, without saying what other incentives or disincentives it would support. Instead, the Administration has relied on high-level diplomacy, appointing a special envoy in July 1997 to hold additional discussions with Moscow on international and bilateral nonproliferation commitments.

Nuclear Cooperation with Iran

Examples of an emerging close relationship with Tehran include the following: in January of 1995, Russia announced an $800 million contract to construct a nuclear reactor in Iran.[12] It calls for a 1,000-megawatt light-water reactor to be built at the Bushehr nuclear power plant near the Persian Gulf coast by August 2000.[13] Moscow also signed a $30 million deal to provide nuclear fuel for the reactor for 20 years after completion and to take back spent fuel for reprocessing.[14] In addition, Rus-

sia agreed to train Iranian nuclear technicians to operate the plant and agreed in principle to construct up to three additional reactors there when the first contract is complete.[15]

Since its inception, the United States has opposed the Bushehr deal and related contracts, arguing that any form of nuclear assistance would directly and indirectly contribute to Tehran's efforts to develop nuclear weapons. As Robert Einhorn explained in Senate testimony in June of 1997, "[i]n our view, this is a large reactor project. It will involve hundreds of Russians being in Iran, hundreds of Iranians or more being in Moscow, being trained. And this large scale kind of project can provide a kind of commercial cover for a number of activities that we would not like to see, perhaps much more sensitive activities than pursuing this power reactor project. It also will inevitably provide additional training and expertise in the nuclear field for Iranian technicians. In our view, given Iran's intention to acquire nuclear weapons we do not want to see them move up the nuclear learning curve at all, and we believe this project would contribute to moving them up that curve."[16]

Although Moscow was unwilling to cancel the Bushehr project, in 1995 the Administration did persuade President Yeltsin to limit the scope of Russian nuclear assistance. Yeltsin approved the sale of nuclear reactors, but ordered Russia's Ministry of Atomic Energy to drop plans to provide equipment and advice to Iran's effort to mine uranium ore and process it to use as reactor fuel — assistance that would have given Iran an independent source of fissile material for nuclear weapons.[17] As Mr. Einhorn said, "[w]e've raised our concerns forcefully and persistently, and at the highest levels, and we believe that Moscow has limited the scope and pace of its planned cooperation. For example, Russia's leadership has ruled out the transfer of a gas centrifuge enrichment facility, heavy water moderated nuclear reactors, and other technologies that are directly useful militarily."[18]

The German firm Siemens began construction of two reactors at the Bushehr nuclear power plant, Tehran's first such facility, in 1974.[19] Siemens abandoned the project after Iran's 1979 Islamic revolution with 80% of the first and 60% of the second reactor reportedly completed.[20] No construction occurred between 1980-1988 during the Iran-Iraq War, when the facility was bombed and damaged during Iraqi air raids.[21] Tehran filed suit against Siemens in international court in August of 1996, seeking $5.4 billion in damages for failure to complete the plant and refusing to turn over documents and parts.[22] Tehran's Minister of Atomic Energy claims Iran has already spent $10 billion to construct the plant.[23]

Russian construction of the plant appears to have started in early 1996. In March of that year, Russia's Minister of Atomic Energy stated the first shipment of construction materials for the plant was scheduled for delivery in April or May.[24] In June, the Russian press service *Interfax* reported that Russian experts had completed a $2 million analysis of the construction site in Bushehr, and that Moscow planned to spend $60 million on construction of the plant by the end of 1996.[25] By November, 200 Russian nuclear technicians and 500 Iranian experts were reportedly working on it.[26] According to Russia's Minister of Atomic Energy, 500 Russian nuclear specialists will eventually work on this Iranian plant.[27]

The Bushehr project has encountered serious technical and financial difficulties. Construction, originally slated to begin in late 1995, was delayed due to Iran's failure to make initial payments. According to *Defense Week*, Iran made its first payments of $20 million for survey work and a $58 million advance payment to Russia in December of 1995, only after Russia's ambassador to Iran announced that failure to pay would delay construction.[28] *Nucleonics Week* reported last September that technical difficulties continue to surround the plan to equip the existing, unfinished reactor shells configured for German vertical generators with horizontal Russian generators based on completely different materials and chemistry.[29] In addition, the IAEA has reportedly prepared an "inch-thick" technical report with numerous recommendations on the seismic conditions at the site and is considering organizing a safety mission to Iran to assist with construction.[30]

Iran has denied having a nuclear weapons program, insisting the Russian reactor will be used in its civilian nuclear power program.[31] President Clinton, Vice President Gore, and other senior administration officials have discussed U.S. concerns with Russian officials on numerous occasions.[32] Russia's willingness to transfer nuclear technology to Iran appears motivated primarily by commercial interests and to a lesser extent to improve relations with Tehran. In January of 1997, Russia's cash-starved nuclear industry announced plans to boost ex-

ports to $3.5 billion per year by the year 2000 by increasing sales to China, Iran, and India.[33] Russia defended the sale, saying Iran has the right to obtain nuclear technology for peaceful purposes under the Nuclear Nonproliferation Treaty (NPT) and is under full-scope IAEA safeguards.[34] Russian officials accused the U.S. of applying a double-standard, since in 1994 the U.S., South Korea, and Japan agreed to supply North Korea with light-water reactors. These reactors, which would replace North Korea's graphite-moderated, heavy-water reactors, are better suited to produce material for nuclear weapons.[35]

According to the *Washington Times*, Western intelligence agencies believe Iran is using its civilian nuclear power program as a cover for acquiring the technology and expertise to build nuclear weapons, a concern also expressed by Mr. Einhorn in Senate testimony.[36] The *Times* reported that in 1994 the CIA estimated Iran was 8-10 years away from building nuclear weapons, but could shorten that timetable with foreign assistance.[37] Although light-water reactors are not well-suited to produce nuclear material for weapons, the U.S. is concerned the reactors might still be used for this purpose. While not ideally suited for a nuclear weapon, the U.S. Department of Energy confirmed during a test in the 1960's that reactor-grade plutonium can be used to make a nuclear weapon.[38] In addition, the Russian reactors would improve Iran's nuclear base and might encourage other nations to engage in nuclear cooperation with Tehran.

Nuclear Cooperation with India

On another front, Russia is negotiating to sell two nuclear reactors to India. The $2.6 billion deal calls for the construction of two 1,000 megawatt light-water reactors at the Kudankulam nuclear power plant in southern India.[39] The Russian reactors are the same as the type being supplied to Iran, and although India has not signed the NPT, the reactors will be placed under IAEA safeguards.[40]

The reactor deal was originally signed in 1988 by Indian Prime Minister Rajiv Ghandi and Soviet President Gorbachev, when the Soviet Union still extended generous financing to client states.[41] Since the Soviet disintegration in 1992, India has been unable to finance the reactors.[42] If built, they would double India's nuclear power capacity, which currently accounts for less than three percent of the country's total electricity production.[43] India has an ambitious plan to expand its current nuclear power capacity to 5,000 megawatts by the year 2000.[44]

India conducted a nuclear test in 1974 and is widely believed to have nuclear weapons.[45] The Indian government denies it possesses nuclear weapons and claims to have only retained a "nuclear option."[46]

In 1992, Russia and the other members of the Nuclear Suppliers Group (NSG) agreed not to sell nuclear technology to undeclared weapons states which have not accepted IAEA safeguards on all nuclear facilities.[47] The Administration has raised concerns about the Indian sale with the Russian government, saying it violates the spirit of the 1992 NSG agreement, but Moscow defends it saying the deal was concluded in 1988 and therefore predates the 1992 agreement.[48] As Mr. Einhorn testified to the Senate in June of 1997,

> We have opposed it, frankly, less because we think that the transfer would contribute materially to India's nuclear weapons program than we think that the transfer would be inconsistent with Russia's commitments as a member of the Nuclear Suppliers Group. As a member of the so-called NSG, Russia has committed not to engage in nuclear cooperation with countries that do not have IAEA safeguards on all of the nuclear activities. India, of course, does not have safeguards on all of its nuclear activities. There is a provision in that commitment that says pre-existing deals can go forward. Russia is attempting to grandfather an old 1988 U.S.S.R.-India, government to government agreement under that provision. In our view, this is not legitimately grandfathered. In 1988 there was no specific contract, no financial arrangements concluded. There are still no financial arrangements concluded. So we tell the Russians that this was not the kind of deal, pre-existing deal, that can be grandfathered, and that it should not go forward with this sale of two power reactors to India. So even though the transfer itself probably does not involve substantial proliferation risks, because we doubt the Indians, who have their own access to unsafeguarded plutonium, would actually divert plutonium from the safeguarded reactors. We nonetheless have urged Russia not to go forward.[49]

In late March of 1997, Indian Prime Minister Gowda discussed the reactor sale in Moscow with Russian President Yeltsin.[50] The two countries were unable to finalize financing terms during Gowda's visit, but Yeltsin reassured India that Russia would ignore U.S. objections to the sale and promised to personally supervise the deal to ensure its smooth progress.[51] Despite this high-level diplomacy, the project's future remains dim. "If there is a saving grace in this story, it is that prospects actually for consummating this nuclear deal may be small," said Mr. Einhorn in recent Senate testimony, explaining, "...the Indian government may not be prepared ultimately to devote the very substantial resources to purchasing two large power reactors from Russia."[52]

Missile Sales to Iran

During talks between Vice President Gore and Russian Prime Minister Chernomyrdin in June of 1995, Moscow agreed to halt conventional arms sales to Iran and join the MTCR.[53] The agreement permitted Russia to fulfill existing contracts, but not to conclude new agreements.[54] On July 24, 1995, Prime Minister Chernomyrdin signed a decree allowing Russia to enter the MTCR.[55] Moscow participated in its first meeting as a full member of the regime on September 10, 1995.[56] In 1997, however, a series of reports on sales of Russian missile technology to Iran have become public.

On September 18, 1997, Assistant Secretary of State for Near Eastern Affairs Martin Indyk testified that Iran could complete development of the Shahab-3 in as little as 12 to 18 months.

According to these reports, numerous institutes and companies, once an integral part of the state-owned military complex of the former Soviet Union, have provided a variety of equipment and material that can be used to design and manufacture ballistic missiles. They are also helping Iran to develop two new ballistic missiles, the Shahab-3 and Shahab-4.[57] The Shahab-3 is reportedly based on North Korea's No Dong 1 ballistic missile and will have a range of 1,300 kilometers with a 700 kilogram payload, sufficient to target Israel and U.S. forces in the region.[58] On September 18, 1997, Assistant Secretary of State for Near Eastern Affairs Martin Indyk testified that Iran could complete development of the Shahab-3 in as little as 12 to 18 months.[59]

The Shahab-4 is said to be based on the Russian SS-4 medium-range ballistic missile and will have a range of 2,000 kilometers with a payload over 1,000 kilograms.[60] Russia's stockpile of SS-4 missiles was destroyed under the Intermediate Nuclear Forces treaty.[61] According to *Jane's Defense Weekly*, during the Cold War, Russia armed some SS-4's with nuclear payloads.[62] When completed, the Shahab-4's longer range will enable Tehran to reach targets as far away as Central Europe.[63] According to the *Washington Times*, an Israeli intelligence report indicates the Shahab-4 could be completed in as little as three years.[64] Israeli intelligence sources reportedly also told *Defense News* that the long-term goals of Iran's missile program are to develop missiles with ranges of 4,500 and 10,000 kilometers.[65] The latter missile could reach the East Coast of the United States.[66]

Press reports on Russian missile cooperation with Iran first appeared in the *Los Angeles Times* on February 12, 1997.[67] The *Times* reported Vice President Gore had issued a diplomatic warning to visiting Russian Prime Minister Chernomyrdin after receiving intelligence reports indicating Russia had recently transferred SS-4 missile technology to Iran.[68] According to the *Times*, the transfer involved detailed instructions on how to build the missile and some unspecified components.[69] The following day, the *Washington Times* indicated the transfer included SS-4 guidance components.[70]

Several of the Russian organizations providing missile assistance to Iran have been identified in the press. According to *Defense News*, NPO Trud, which developed liquid-propellant engines for Soviet ICBM's and space launch vehicles including the failed N-1 Moon rocket program, is assisting Tehran with the development of rocket engines.[71] The Polyus Research Institute in Moscow is reportedly supplying guidance systems, and Russia's Central Aerohydrodynamic Institute (TSAGI) has conducted wind tunnel tests.[72]

TSAGI is also helping Iran improve its infrastructure and ability to design ballistic missiles.[73] On May 22, 1997, the *Washington Times* reported that "sensitive intelligence reports" indicate the institute signed nearly a dozen contracts worth about $150,000 with Iran's Defense Industries Organization between February and July of 1996 for assistance with the construction of a wind tunnel, manufacture of missile models, and the sale of missile design software.[74]

In May of 1997, the *Times* also reported that a Russian scientific center named Inor was negotiating to sell laser equipment, special mirrors, maraging steel, and tungsten-coated graphite material to Tehran.[75] Five months later, the paper reported that the Director of Inor, L.P. Chromova, and A. Asgharazadeh, the director of an unidentified Iranian factory, had completed a deal calling for Inor to supply 620 kilograms of special metal alloys used in ballistic missiles.[76] Inor reportedly agreed to supply high strength steel alloy bars, which Iran would shape into missile-casing material, and three types of alloy foil in thin sheets between 0.2 and 0.4 millimeters thick, used to shield guidance equipment in missiles.[77]

Russia's arms export agency Rosvoorouzhenie has also been identified in the press as involved in transferring missile technology to Iran, and according to Russia's internal security service, Iranians are studying "rocket construction" at Russian institutes, including Baltic State University in St. Petersburg and Bauman State Technical University in Moscow.[78] The service, however, claims the students only study "generally accessible" information.[79]

In addition to discussing Russian nuclear cooperation with Iran and India, the Clinton Administration has also engaged in a series of high-level talks intended to persuade Moscow to halt missile assistance to Iran. President Clinton raised the issue with President Yeltsin at a U.S.-Russia summit meeting in Helsinki in March of 1997, and in private meetings at the P-8 economic summit in Denver in June of that year.[80] Vice President Gore had similar discussions with Prime Minister Chernomyrdin in February, June, and September of 1997.[81] Secretary of State Albright did the same with Russian Foreign Minister Primakov in Malaysia in July of 1997, and the U.S. has reportedly sent over a dozen diplomatic protest notes to Moscow.[82] British Prime Minister Tony Blair and Israeli Prime Minister Benjamin Netanyahu have also raised the issue with President Yeltsin.[83]

In July, President Clinton appointed an experienced diplomat, Ambassador Frank Wisner, as special envoy for the problem.[84] President Yeltsin assigned Russian Space Agency Director Yuri Koptev to a similar role for Russia.[85] Messrs. Wisner and Koptev held three rounds of talks in August, October, and November of 1997, at which Wisner reportedly described for the Russians the details of involvement by Russian organizations and urged the Russian government to put a stop to it.[86] According to the *Washington Times*, an Israeli intelligence report suggested that the lack of Russian action was due to the fact that Mr. Koptev himself was "directly involved" in the transfer of missile technology to Iran, a charge he denies.[87]

Deputy Assistant Secretary Einhorn summarized the results of this high-level U.S. diplomacy in testimony to the Senate, stating, "[w]e have pressed the Russian leadership at the highest levels. And, as I mentioned, we have been told that it is not Russia's policy to assist Iran's long-range missile programs."[88] He added, "[w]e have provided them information available to us to demonstrate that we know what we are talking about, and we have urged them to investigate seriously and to prevent any activity that would be inconsistent with what they state is their own national policy."[89]

Although Prime Minister Chernomyrdin has acknowledged the transfer of ballistic missile technology would violate Russia's pledge not to conclude additional arms sales to Iran, he has publicly denied any such assistance has been given to Tehran.[90] Other Russian leaders, too, deny missile cooperation is occurring. In September of 1997, Foreign Minister Primakov categorically stated no official or unauthorized missile assistance had been provided to Iran and insisted Moscow would not allow such allegations to deter it from developing closer economic ties to Iran.[91] "Not a single project via government channels has been undertaken by Russia with Iran," Primakov told a press conference in Moscow, adding, "no leaks of the type which could assist Iran in creating either nuclear arms or long-range missiles have taken place via non-government channels either."[92]

Later that month, after talks with French President Chirac, President Yeltsin told reporters "[w]e are being accused of supplying Iran with nuclear or ballistic technologies. There is nothing further from the truth. I use this occasion to refute decisively these rumors."[93] As re-

cently as November, Mr. Koptev has also denied that Russia has provided missile technology to Iran.[94]

Russian government officials have acknowledged Iran's attempts to purchase missile technology, but claim Russia's internal security service has thwarted all such attempts.[95] In an interview with the Russian news agency *Tass* in October of 1997, an unnamed official admitted "...cases of cooperation with Iran which could have resulted in Russian deliveries violating international agreements."[96] But "...they had all been detected at an early stage," the official said, "and a stop has been put to them."[97] The Russian statement specifically mentioned Russia had foiled an Iranian attempt to have parts manufactured for a liquid-propellant missile by NPO Trud. The official said the parts were being disguised as gas compressors or pumps.[98]

In November of 1997, the Russian security service announced it had arrested and deported an Iranian diplomat caught attempting to buy missile designs. Its statement said, "[o]n Nov. 14, security organs caught an Iranian citizen red-handed, thwarting his attempt to obtain for money design documents for missile technology from Russian specialists."[99] Russia's NTV television station reported that Russian security agents followed the diplomat for two weeks before arresting him after he contacted employees of Russian defense organizations and offered to buy missile drawings.[100] Iran's ambassador to Russia denied the individual had attempted to purchase missile designs, claiming he was only a student in Moscow with no connection to the Iranian Embassy.[101]

The day before the Russian announcement, Israeli Prime Minister Netanyahu had complained about the continuing flow of technology to Iran. Netanyahu called the Russian assistance "absolutely critical" to Iran's capabilities, and warned that, "[i]f the supply of Russian technology is not stopped then within a year Iran would become self-sufficient and would be able to create those missiles on its own."[102]

Mr. Einhorn summarized the dangerous consequences of continuing Russian missile assistance to Iran, stating, "Iran's acquisition of a long-range missile delivery capability, coupled with its continued pursuit of nuclear weapons and other weapons of mass destruction would pose a grave threat to U.S. forces and friends, and to regional stability in general. We do not believe that Russia has transferred any long-range missiles to Iran, but Iran is now not giving priority to importing complete missiles. Rather, it is actively seeking various types of technical assistance and cooperation that would enable it to produce its own long range missiles indigenously."[103]

Transfer of Missile Components to Iraq

Twice in recent years, U.N. weapons inspectors have seized shipments of Russian missile guidance components in or enroute to Iraq. In November of 1995, Jordan seized 115 sets of Russian guidance components for long-range, intercontinental missiles (ICBM's) at the Amman airport.[104] The equipment was reportedly shipped in August of 1995 on flights originating in Moscow, and has been valued at over $25 million by the United Nations.[105] The *Washington Post* reported that U.S. and U.N. officials stated the components were clearly marked Russian-made.[106]

About a month later, on December 9, 1995, divers working for the U.N. fished a second shipment of 30 Russian gyroscopes out of the Tigris River near Baghdad.[107] The gyroscopes came from the submarine-launched SS-N-18 ICBM, which has a maximum range of nearly 5,000 miles and can carry up to seven nuclear warheads.[108] The SS-N-18 is being destroyed under the terms of the START I treaty.[109]

According to Vladimir Orlov, Director of the Center for Policy Studies in Russia, research provided "100 percent certainty" that the 30 gyroscopes came from the Scientific Testing Institute of Chemical Machine Building, a plant north of Moscow that dismantles missiles from submarines under START I.[110] According to a report prepared by Orlov's center, the missile components were diverted after an unidentified Lebanese businessman offered to buy some of the equipment taken from the missiles.[111] A suburban Moscow company called TASM, headed by a retired general and specializing in delivery of optical equipment like binoculars and gun sights, from Russia's military industrial complex reportedly helped to facilitate the deal.[112]

The report indicates fake documents were drawn up which labeled the gyroscopes as "electrical measuring equipment." The components were then shipped air freight to Jordan.[113] It is unclear how the gyroscopes were delivered to Iraq or why they were later dumped or hid-

den in the Tigris. According to Orlov, they were diverted to Iraq without the involvement of senior Russian officials.[114] Rather, he said, the smugglers and middlemen were motivated by profit and got through Russian customs without detection.[115]

Moscow has denied all knowledge of the shipments, which would violate its pledge to adhere to both the MTCR and the trade embargo imposed on Iraq by the U.N. Security Council after the 1991 Gulf War.[116] As Mr. Einhorn told the Senate, "[t]hose gyroscopes, those guidance components that were found by [the U.N.] should not have been sent to Iraq. This was clearly a violation of the embargo. The question is who is responsible for this violation."[117] Einhorn further noted that "...what we do know of it leads us to the conclusion that this was a kind of black market action, a renegade action, and not the conscious decision of Moscow."[118]

Iraq has denied purchasing the guidance components, but according to the *Washington Post*, documents obtained by the U.N. indicate the parts were ordered by the Karama research center near Baghdad, where Iraq continues to work on missiles with a range of less than 150 kilometers.[119] Such short-range missiles are allowed by the cease-fire resolutions approved by the U.N.[120]

Iraq probably wanted to stockpile the guidance components until it could produce or acquire other components for a long-range missile. As Tim McCarthy, senior analyst at the Center for Nonproliferation Studies, noted, sophisticated guidance components are a key element in the quest by Iraq and other countries to build missiles that can carry weapons of mass destruction.[121] "If you are developing a long-range missile, for instance, to hit London and Washington and New York, you have to guide it," McCarty said.[122] "It's very difficult to develop this technology indigenously. It requires tremendous expertise and equipment. You need high-technology guidance systems, and you need to purchase them."[123] If the guidance systems can be obtained, he added, they "...fill a gap the Libyans, Iraqis, and Iranians cannot fill themselves."[124]

Conclusion

Russia has recently emerged as a principal supplier of nuclear and ballistic missile technology to countries of proliferation concern. Therefore, Moscow's cooperation is essential if the spread of these sensitive weapons technologies is to be curtailed.

> *"Iran's acquisition of a long-range missile delivery capability, coupled with its continued pursuit of nuclear weapons and other weapons of mass destruction would pose a grave threat to U.S. forces and friends, and to regional stability in general. We do not believe that Russia has transferred any long range missiles to Iran, but Iran is now not giving priority to importing complete missiles. Rather, it is actively seeking various types of technical assistance and cooperation that would enable it to produce its own long range missiles indigenously."*
>
> – Robert Einhorn,
> Dep. Asst. Secretary of State
> for Nonproliferation

Of particular concern is the transfer of nuclear and ballistic missile technology to Iran. As the *Washington Post* noted in an editorial on September 30, 1997, "There is no country that people everywhere would rather see without missiles and nuclear, chemical or biological warheads than Iran. The regime flouts the international rules and menaces other states with terrorism, subversion and anathema."[125]

Despite Iran's dangerous reputation, Russia's leaders steadfastly defend their decision to sell nuclear reactors to Tehran. In September of 1997 Foreign Minister Primakov flatly stated, "[w]e will build the nuclear power station in Bushehr. Nothing will change this stance as it has nothing to do with..." suspicions of unauthorized assistance to Iran's nuclear and missile programs.[126] He added: "At the same time, it [the Bushehr deal] is quite important for Russia in terms of the economy."[127] Although some transfers may have occurred without Moscow's approval, Russian nuclear deals with Iran and India appear to enjoy the backing of President Yeltsin and other senior officials.

Iran's interests are by no means limited to nuclear technology. As the DCI noted in a recent report to Congress, "Iran continues to be one of the most active countries seeking to acquire all types of WMD technology and advanced conventional weapons. Its efforts in the last half of 1996 have focused on acquiring production technology that will give Iran an indigenous production capability for all types of WMD. Numerous interdiction efforts by the U.S. government have interfered with Iranian attempts to purchase arms and WMD-related goods, but Iran's acquisition efforts remain unrelenting."[128]

The purchase of nuclear reactors from Russia and other nuclear facilities from China seem to be part of an effort to obtain and produce weapons of mass destruction. The reactor project will also provide Iran with the commercial cover necessary to purchase dual-use nuclear technologies. In addition, although Moscow has agreed to limit the scope of its nuclear dealings with Iran, and has canceled some forms of cooperation that were more directly useful militarily, reports indicate Moscow may not have complied fully with these restrictions.[129]

"Russia is either incapable of controlling such [missile] exports, or is unwilling to control them, or both, in spite of such capability and willingness being key criteria for membership in the MTCR."

– Richard Speier
Former Bush Administration Official

On July 3, 1997, the *Washington Post* reported the Administration had privately complained to Moscow that Russia's nuclear cooperation with Iran exceeded the limits of President Yeltsin's promise two years earlier.[130] The *Post* said the U.S. complaint was based on "intelligence reports documenting a series of high-level technical exchanges between Russian and Iranian engineers and technicians," which covered matters beyond the civilian nuclear reactors to be built at Bushehr.[131] The newspaper also quoted an unidentified U.S. official as saying, "from time to time, we get reports that the scope is not constrained."[132]

Apparently Russian experts were still advising Iran on how to mine uranium ore and process it for eventual use in its nuclear program.[133] If Iran acquires the ability to mine and process uranium, it could either enrich it to weapons-grade material or use it to make fuel rods that could be irradiated to produce plutonium for use in a nuclear weapon.[134] Oil-rich Iran has little, if any, other use for this ore. The fact that Russian engineers and technicians are working in Iran on the Bushehr reactor project increases the concern that unauthorized transfers of nuclear equipment and expertise could occur.

Iran's increasingly advanced ballistic missile programs also pose an immediate threat. According to press reports and U.S. government officials, Russian assistance has been the critical accelerator of Iran's missile program and may enable Tehran to complete the 1,300 kilometer range Shahab-3 missile, which could reach Israel, in as little as 12-18 months.[135] Development of the 2,000 kilometer range Shahab-4 could be completed in as little as three years, placing U.S. forces and friends as far away as Central Europe at risk from attack by ballistic missiles armed with mass destruction warheads.[136] Most troubling is an assessment that if the flow of Russian missile technology to Iran is not stopped within a year, Tehran's missile program will become largely self-sufficient and less vulnerable to international pressure.[137]

Russia's disorderly transition from central planning toward the free market makes credible reports of the transfer of sophisticated missile guidance components to Iraq without government approval. While the extent of government approval is unclear in the case of missile assistance to Iran, Moscow is aware of the transactions, if only because of U.S. diplomatic protest notes and high-level discussions between American and Russian officials. During these talks, Russian officials, including President Yeltsin, deny any Moscow policy to assist Iran's missile program. But as Mr. Einhorn said in Senate testimony, "...the problem is this: There is a disconnect between those reassurances, which we welcome, and what we believe is actually occurring."[138]

In light of persistent reports of Russian assistance to Iran's missile program, the pattern of assurances and flat denials by President Yeltsin and other senior Russian officials is troubling indeed. Russia must move beyond deni-

als to controls which will stop the hemorrhage of missile technology over its borders. As Senator Carl Levin noted during a recent Senate hearing, "Russia needs to improve its ability and desire to root out and prevent proliferation. That may mean at times finding incentives for responsible behavior and disincentives for irresponsible behavior, whether at the government or private sector level."[139]

Russia could, for instance, improve its export control system. As Mr. Einhorn said in Senate testimony, "Russian export controls are new, and clearly they need further strengthening."[140] But Russia has rejected such steps and has refused U.S. assistance. Mr. Einhorn further noted, "[w]e have under the Nunn-Lugar program made funds available for export control assistance to Russia, and we have sought to interest the Russian government in a very serious technical exchange aimed at strengthening their capabilities in this area. And there has been some cooperation, but it has not gone very far, not because of a reticence on our part, but for a variety of reasons I think the Russian government is reluctant for us to be too closely engaged with them in this effort."[141]

Former Bush Administration official Richard Speier assessed the situation in 1997, stating, "Russia is either incapable of controlling such [missile] exports, or is unwilling to control them, or both, in spite of such capability and willingness being key criteria for membership in the MTCR."[142] But the primary response of the Clinton Administration has been to engage in a series of high-level discussions with Russia, including the appointment of a special envoy to hold such talks on a regular basis.

While these talks continue, Iran's missile program is becoming self-sufficient and Tehran moves ever closer to the moment when it can launch ballistic missiles with chemical or biological warheads against Israel and U.S. forces. Despite Mr. Einhorn's testimony to the Senate, "[p]ursuing our nonproliferation agenda with Russia will involve both incentives and disincentives," the Administration's incentives to influence Russia's behavior appear to consist entirely of continued Nunn-Lugar funding and abstaining from imposing sanctions.[143] Furthermore, the Administration has opposed calls from the U.S. Congress to use disincentives like economic sanctions and restrictions on U.S. aid.

The Administration can and should do more to halt the dangerous Russian-Iranian trade. As Richard Speier said, "I think what we are talking about is the question of the cost/benefit calculus of these exports. If there is a penalty to making these exports then they are less likely to be made than if they get a free ride."[144] Speier also explained, "[w]e really have not been too active in missile -related sanctions in recent years. If we were, we might see a different behavior on the part of these exporters."[145]

That the Russian government may or may not have approved various transfers of missile technology to Iran should not be used to excuse this cooperation. Russia has a responsibility to control its own borders. The United States has offered assistance to improve Russian export controls and has shared sufficient intelligence with Moscow to enable the government to crack down on errant firms. But Russia has rejected U.S. export control assistance and has not halted the flow of missile technology to Iran.

Although the Israeli government has also held high-level talks with Russian officials, it has been more willing than the United States to use economic incentives and disincentives to influence Russian behavior. In September of 1997 Prime Minister Netanyahu suspended negotiations on a $4 billion natural gas purchase to protest the sale of nuclear and missile technology to Iran.[146] Prime Minister Chernomyrdin tried to downplay the cancellation, saying, "[t]hey, not we, need the gas."[147] But Russia needs hard currency earnings to aid its ailing economy. Beyond applying economic disincentives, Israel has worked on its defense against the Iranian missile threat by accelerating development of the Arrow-2 theater missile defense system, pushing up deployment by a full year.[148]

Throughout 1997, the U.S. Congress has urged the Administration to take stronger steps. In September of 1997, 33 Senators and 63 Representatives signed a letter to President Clinton stating, "[t]he time has come for the United States to urge the Russian government to go further than merely investigate the origin of the allegations. We, therefore, call on the Administration to demand that the Russian government take appropriate steps."[149]

The Administration's lack of success has prompted Congress to adopt a Concurrent Resolution in protest. The resolution, which was passed unanimously in the Senate and by a vote of 414 to 8 in the House of Representatives, called on Russia to halt assistance to Iran's

missile program and said if Moscow did not do so "...the United States should impose sanctions on the responsible Russian entities."[150]

Congress also placed restrictions on aid to Russia in the fiscal year 1998 Foreign Operations Appropriations Act.[151] The legislation calls for withholding 50 percent of the aid for Russia unless the President certifies to Congress that "...the Government of Russia has terminated implementation of arrangements to provide Iran with technical expertise, training, technology, or equipment necessary to develop a nuclear reactor, related nuclear research facilities or programs, or ballistic missile capability."[152]

If the President is unable to make this certification, he may still provide U.S. aid to Russia if he notifies Congress that, "...making such funds available (A) is vital to the national security interest of the United States, and (B) that the Government of Russia is taking meaningful steps to limit major supply contracts and to curtail the transfer of ..." nuclear and ballistic missile technology to Iran.[153]

Since the end of the Cold War, the United States and Russia have worked to forge closer ties and eliminate the animosity that characterized their relationship since the end of the Second World War. Together with this effort, the establishment in Russia of democratic institutions and a market economy will serve the long term interests of the United States. But the U.S. cannot overlook Russian sales of sensitive nuclear and missile technology to a radical regime in Tehran. As the *Washington Post* said in an editorial on September 30, 1997, "[t]he many strands of American policy toward Russia slow the Clinton Administration's march on Iranian proliferation. This is wrong if it means American balance is making it easier to arm provocatively a regime whose hints of domestic moderation have yet to find reflection in its foreign policy. At some point Israel and Iran, like Israel and Iraq, must be brought into the circle of coexistence in the Middle East. Meanwhile, the deterrence of war by the denial of Iranian proliferation — an objective Americans share with Israelis, Saudis, Europeans and many others — comes first."[154]

The Administration should do more than engage in discussions with Russia's leaders. Just as with China, sanctions alone will not stop proliferation. But allowing this trade to go on cost-free signals Russia that the United States is not as serious about nonproliferation as it purports to be.

ENDNOTES

[1] Director of Central Intelligence Report to Congress, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-December 1996," June 1997, p. 6. Hereafter cited as DCI Report.

[2] R. Jeffrey Smith, "Administration Concerned About Russia's Nuclear Cooperation With Iran," *Washington Post*, July 3, 1997, p. A7, and David Hoffman, "Russian Missile Gyroscopes Were Sold to Iraq," *Washington Post*, September 12, 1997, p. A1.

[3] DCI Report, p. 6.

[4] U.S. Congress, Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, Hearing on *Proliferation: Russian Case Studies*, June 5, 1997, p. 4. Hereafter cited as Hearing, *Proliferation: Russian Case Studies*.

[5] Lee Hockstader, "Rampages by Russian Troops Illustrate Army Erosion," *Washington Post*, June 4, 1997, p. A27.

[6] "314 Suicides Reported by Russian Serviceman," *Richmond Times-Dispatch*, November 20, 1997, p. 4.

[7] Hearing, *Proliferation: Russian Case Studies*, p. 4.

[8] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran by Arms Experts," *New York Times*, August 22, 1997, p. A1; Bill Gertz, "Russian Missile Assurance Challenged," *Washington Times*, June 6, 1997, p. 10; David Hoffman, "Russia Says It Thwarted Attempt by Iran to Get Missile Technology," *Washington Post*, October 3, 1997, p. A35; Bill Gertz, "Russia, China Aid Iran's Missile Program," *Washington Times*, September 10, 1997, p. A1.

[9] Richard Boudreaux, "Russia Agrees to Stop Selling Arms to Iran," *Los Angeles Times*, July 1, 1995, p. A1, and R. Jeffrey Smith, "Administration Concerned About Russia's Nuclear Cooperation With Iran," *Washington Post*, July 3, 1997, p. A7.

[10] Richard Boudreaux, "Russia Agrees to Stop Selling Arms to Iran," *Los Angeles Times*, July 1, 1995, p. A1.

[11] Hearing, *Proliferation: Russian Case Studies*, p. 6.

[12] Martin Sieff, "Christopher Backs Aid to Russia, Hits Iran Deal," *Washington Times*, March 30, 1995, p. A21.

[13] "Iran Now Paying Russia to Build Nuclear Reactor," *Dow Jones News Service*, Feb. 6, 1996.

[14] "Russia Nuclear Plant in Iran to be Completed on Schedule," *Deutsche Presse-Agentur,* November 23, 1996, and Martin Sieff, "Report of Reactor Sale Leads to Probe," *Washington Times*, August 29, 1995, p. A7.

[15] "Russia to Train Iranians for Nuclear Plant," *Agence France-Presse*, October 12, 1996.

[16] Hearing, *Proliferation: Russian Case Studies*, p. 11.

[17] R. Jeffrey Smith, "Administration Concerned About Russia's Nuclear Cooperation With Iran," *Washington Post*, July 3, 1997, p. A7.

[18] Hearing, Proliferation: Russian Case Studies, p. 5.

[19] "Russia Nuclear Plant in Iran to be Completed on Schedule," *Deutsche Presse-Agentur*, November 23, 1996.

[20] *Ibid.*

[21] *Ibid.*

[22] "Iran Sues Germany's Siemens Over Incomplete Nuclear Plant, *Dow Jones News Service*, August 28, 1996.

[23] "Russia, China Brush Aside U.S. Objections," *Dow Jones News Service*, August 20, 1996.

[24] "Russia to Invest $60 MLN in Bushehr Nuclear Power Plant," *Interfax*, June 4, 1996.

[25] *Ibid.*

[26] "Russia Nuclear Plant in Iran to be Completed on Schedule," *Deutsche Presse-Agentur*, November 23, 1996.

[27] "Progress in Work on Iran's Bushehr Nuclear Plant," *Dow Jones News Service*, March 4, 1996.

[28] "Iran Slow to Pay Russia for Plant, Sub," *Defense Week*, January 16, 1996.

[29] Mark Hibbs, "Russia-Iran Bushehr PWR Project Shows Little Concrete Progress," *Nucleonics Week*, September 26, 1996.

[30] *Ibid.*

[31] "Tehran, Russia Sign Accord Affecting Nuclear Deals," *Reuters*, December 24, 1996.

[32] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran by Arms Experts," *New York Times*, August 22, 1997, p. A1; David Hoffman, "Russia Says It Thwarted Attempt by Iran to Get Missile Technology," *Washington Post*, October 3, 1997, p. A35; David Hoffman, "Gore Says Probe Shows Iran Seeks Technology to Build Nuclear Arms," *Washington Post*, September 24, 1997, p. 26; Bill Gertz, "Gore Raises Sale to Iran with Chernomyrdin," *Washington Times*, February 13, 1997.

[33] "Russian Says Nuclear Exports to Reach $3.5 Bln by 2000," *Dow Jones News Service*, January 19, 1997.

[34] "Russia is Very Cautious in Transfers of Nuclear Technology," Letter to the Editor by Vladimir Derbenev, Press Counselor, Russian Embassy, Washington D.C., *Washington Times*, March 9, 1995, p. A20.

[35] *Ibid.*

[36] James Phillips, "Iran's Ominous Nuclear Ambitions," *Washington Times*, January 19, 1995, p. A18, and Hearing, *Proliferation: Russian Case Studies*.

[37] Phillips, "Iran's Ominous Nuclear Ambitions," p. A18.

[38] U.S. Department of Energy press release, June 27, 1994.

[39] Andrei Ivanov, "Russia: Nuclear Reactor Sales On, Despite U.S. Objections," *Inter Press Service*, February 18, 1997, and Mahesh Uniyal, "India: Russian Reactors to Revive Flagging Energy Program," *Inter Press Service*, March 27, 1997.

[40] *Ibid.*

[41] "India: Gowda's Visit to Russia to Hasten Cryogenic Tech. Deal," *The Hindu*, March 25, 1997.

[42] *Ibid.*

[43] Mahesh Uniyal, "India: Russian Reactors to Revive Flagging Energy Program," *Inter Press Service*, March 27, 1997.

[44] *Ibid.*

[45] Andrei Ivanov, "Russia: Nuclear Reactor Sales On, Despite U.S. Objections," *Inter Press Service*, February 18, 1997, and Mahesh Uniyal, "India: Russian Reactors to Revive Flagging Energy Program," *Inter Press Service*, March 27, 1997.

[46] "India Prime Minister: Will Keep Nuclear Options Open," *Dow Jones News Service*, September 9, 1997.

[47] Andrei Ivanov, "Russia: Nuclear Reactor Sales On, Despite U.S. Objections," *Inter Press Service*, February 18, 1997.

[48] *Ibid.*

[49] Hearing, *Proliferation: Russian Case Studies*, p. 12.

[50] Mahesh Uniyal, "India: Russian Reactors to Revive Flagging Energy Program," *Inter Press Service*, March 27, 1997.

[51] *Ibid.*, and "Still No Nuclear Plant Deal Between Russia and India" *Agence France-Presse*, March 25, 1997,

[52] Hearing, *Proliferation: Russian Case Studies*, p. 17.

[53] Richard Boudreaux, "Russia Agrees to Stop Selling Arms to Iran," *Los Angeles Times*, July 1, 1995, p. A1.

[54] *Ibid.*

[55] Alexsandr Krasulin, "Decree on Missile Technology Export Controls," *Rossiyskaya Gazeta* (Moscow), August 18, 1995, p. 14.

[56] "MTCR Expands," *Arms Sales Monitor*, December 5, 1995, p. 4.

[57] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran By Arms Experts," *New York Times*, August 22, 1997, p. A1; Bill Gertz "Russia Disregards Pledge to Curb Iran Missile Output," *Washington Times*, May 22, 1997, p. 3; Bill Gertz, "Russia, China Aid Iran's Missile Program," *Washington Times*, September 10, 1997, p. A1; Steve Rodan, "Secret Israeli Data Reveals Iran Can Make Missile in Year," *Defense News*, Oct. 6-12, 1997, p. 4; David Hoffman, "Gore Says Probe Shows Iran Seeks Technology to Build Nuclear Arms," *Washington Post*, September 24, 1997, p. 26.

[58] Bill Gertz, "Russia, China Aid Iran's Missile Program," *Washington Times*, September 10, 1997, p. A1, and Steve Rodan, "Secret Israeli Data Reveals Iran Can Make Missile in Year," *Defense News*, Oct. 6-12, 1997, p. 4.

[59] U. S. Congress, Senate Foreign Relations Committee, *Confirmation Hearing*, September 18, 1997, p. 41.

[60] Steve Rodan, "Secret Israeli Data Reveals Iran Can Make Missile in Year," *Defense News*, Oct. 6-12, 1997, p. 4.

[61] Bill Gertz,"Gore Raises Sale to Iran with Chernomyrdin," *Washington Times*, February 13, 1997.

[62] Ed Blanche, "Israel Objects to Russian Missile Sales to Iran," *Jane's Defense Weekly*, March 12, 1997, and Carole Landry, "Netanyahu Urges Halt to Missile Transfers to Iran, Iraq, Syria...," *Agence France-Presse*, February 14, 1997.

[63] Bill Gertz, "Russia, China Aid Iran's Missile Program," *Washington Times*, September 10, 1997, p. A1.

[64] *Ibid.*

[65] Steve Rodan, "Secret Israeli Data Reveals Iran Can Make Missile in Year," *Defense News*, Oct. 6-12, 1997, p. 4.

[66] *Ibid.*

[67] Robin Wright, "Russia Warned on Helping Iran Missile Program," *Los Angeles Times*, February 12, 1997, p. A1.

[68] *Ibid.*

[69] *Ibid.*

[70] "Gore Raises Sale to Iran with Chernomyrdin," *Washington Times*, February 13, 1997.

[71] Steve Rodan, "Secret Israeli Data Reveals Iran Can Make Missile in Year," *Defense News*, Oct. 6-12, 1997, p. 4.

[72] *Ibid.*, *Defense News*, Oct. 6-12, 1997, p. 4, and "Russian Space Industry — Samara Science and Technical Complex named after N.D. Kuznetsov," http://www.fas.org/spp/civil/russia/nkengine.htm, December 3, 1997.

[73] Bill Gertz, "Russia Disregards Pledge to Curb Iran Missile Output," *Washington Times*, May 22, 1997, p. A3.

[74] *Ibid.*

[75] *Ibid.*

[76] Bill Gertz, "Russia Sells Iran Missile Metals," *Washington Times*, October 20, 1997, p. A1.

[77] *Ibid.*

[78] David Hoffman, "Russia Says It Thwarted Attempt by Iran to Get Missile Technology," *Washington Post*, October 3, 1997, p. A35, and Bill Gertz, "Russia, China Aid Iran's Missile Program," *Washington Times*, September 10, 1997, p. A1.

[79] *Ibid.*

[80] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran by Arms Experts," *New York Times*, August 22, 1997, p. A1, and Bill Gertz, "Russian Missile Assurance Challenged," *Washington Times*, June 6, 1997, p. 10.

[81] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran by Arms Experts," *New York Times*, August 22, 1997, p. A1; David Hoffman, "Russia Says It Thwarted Attempt by Iran to Get Missile Technology," *Washington Post*, October 3, 1997, p. A35; David Hoffman "Gore Says Probe Shows Iran Seeks Technology to Build Nuclear Arms," *Washington Post*, September 24, 1997, p. 26; Bill Gertz, "Gore Raises Sale to Iran with Chernomyrdin," *Washington Times*, February 13, 1997; "U.S. Gore Meets Kazakstan, Ukraine, Russia Leaders" *Dow Jones News Service*, June 23, 1997.

[82] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran by Arms Experts," *New York Times*, August 22, 1997, p. A1, and Bill Gertz, "Missiles in Iran of Concern to State," *Washington Times*, September 11, 1997, p. A1.

[83] John Morrison, "Russia Still Giving Iran Missile Help — Netanyahu," *Reuters*, November 11, 1997.

[84] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran by Arms Experts," *New York Times*, August 22, 1997, p. A1.

[85] Bill Gertz, "Russia Sells Iran Missile Metals," *Washington Times*, October 20, 1997, p. A1.

[86] Steven Erlanger, "U.S. Telling Russia to Bar Aid to Iran by Arms Experts," *New York Times*, August 22, 1997, p. A1; David Hoffman, "Gore Says Probe Shows Iran Seeks Technology to Build Nuclear Arms," *Washington Post*, September 24, 1997 p. 26; Anatoly Verbin, "Russia Deports Iranian for Trying to Buy Missile Designs," *Reuters* reprinted in *Washington Times*, November 25, 1997, p. A8; Bill Gertz, "U.S., Israel Target Missile Aid to Iran," *Washington Times*, September 13, 1997, p. A1.

[87] Bill Gertz, "Russia, China Aid Iran's Missile Program," *Washington Times*, September 10, 1997, p. A1, and Anne Eisele, "Official Denies Russia Transfers Missile Technology to Iran," *Defense News*, Sep. 15-21, 1997, p. 8.

[88] Hearing, *Proliferation: Russian Case Studies*, p. 15.

[89] *Ibid.*

[90] Steve Rodan, "Secret Israeli Data Reveals Iran Can Make Missile in Year," *Defense News*, Oct. 6-12, 1997, p. 4, and Bill Gertz, "Gore Raises Sale to Iran with Chernomyrdin," *Washington Times*, February 13, 1997.

[91] "Primakov Denies Russian Involvement in Iranian Nuclear Arms Projects," *Interfax*, September 15, 1997.

[92] *Ibid.*

[93] "Yeltsin Denies Helping Iran to Design Missiles," *Reuters*, September 26, 1997.

[94] Anatoly Verbin, "Russia Deports Iranian for Trying to Buy Missile Designs," *Reuters* reprinted in *Washington Times*, November 15, 1997, p. A8.

[95] David Hoffman, "Russia Says It Thwarted Attempt by Iran to Get Missile Technology," *Washington Post*, October 3, 1997, p. A35, and Vladimir Isachenkov, "Russia Blocks Iran on Missiles," *Associated Press*, October 2, 1997.

[96] Vladimir Isachenkov, "Russia Blocks Iran on Missiles," *Associated Press*, October 2, 1997.

[97] David Hoffman, "Russia Says It Thwarted Attempt by Iran to Get Missile Technology," *Washington Post*, October 3, 1997, p. A35.

[98] *Ibid.*, and Vladimir Isachenkov, "Russia Blocks Iran on Missiles," *Associated Press*, October 2, 1997.

[99] Anatoly Verbin, "Russia Deports Iranian for Trying to Buy Missile Designs," *Reuters* reprinted in *Washington Times*, November 15, 1997, p. 8.

[100] *Ibid.*

[101] "Iranian Accused in Arms Case to Be Expelled From Russia," *Washington Post*, November 18, 1997, p. A16.

[102] John Morrison, "Russia Still Giving Iran Missile Help — Netanyahu," *Reuters*, November 13, 1997.

[103] Hearing, *Proliferation: Russian Case Studies*, p. 5.

[104] "Russia Denies Role in Alleged Iraq Missile Cargo," *Reuters*, December 9, 1995.

[105] R. Jeffrey Smith, "U.N. Is Said to Find Russian Markings on Iraq-Bound Military Equipment," *Washington Post*, December 15, 1995, p. A30.

[106] *Ibid.*

[107] David Hoffman, "Russian Missile Gyroscopes Were Sold to Iraq," *Washington Post*, September 12, 1997, p. A1.

[108] *Ibid.*

[109] *Ibid.*

[110] *Ibid.*

[111] *Ibid.*

[112] *Ibid.*

[113] *Ibid.*

[114] *Ibid.*

[115] *Ibid.*

[116] R. Jeffrey Smith, "U.N. Is Said to Find Russian Markings on Iraq-Bound Military Equipment," *Washington Post*, December 15, 1995, p. A30.

[117] Hearing, *Proliferation: Russian Case Studies*, p. 13.

[118] *Ibid.*

[119] R. Jeffrey Smith, "U.N. Is Said to Find Russian Markings on Iraq-Bound Military Equipment," *Washington Post*, December 15, 1995, p. A30.

[120] *Ibid.*

[121] David Hoffman, "Russian Missile Gyroscopes Were Sold to Iraq," *Washington Post*, September 12, 1997, p. A1.

[122] *Ibid.*

[123] *Ibid.*

[124] *Ibid.*

[125] "Those Iranian Missiles," *Washington Post*, September 30, 1997, p. A20.

[126] "Primakov Denies Russian Involvement in Iranian Nuclear Arms Projects," *Interfax*, September 15, 1997.

[127] *Ibid*.

[128] DCI Report, p. 4.

[129] R. Jeffrey Smith, "Administration Concerned About Russia's Nuclear Cooperation with Iran," *Washington Post*, July 3, 1997, p. A7.

[130] *Ibid.*

[131] *Ibid.*

[132] *Ibid.*

[133] *Ibid.*

[134] *Ibid.*

[135] U.S. Congress, Senate Foreign Relations Committee, *Confirmation Hearing*, September 18, 1997, p. 41.

[136] Bill Gertz, "Russia, China Aid Iran's Missile Program," *Washington Times*, September 10, 1997, p. A1.

[137] John Morrison,"Russia Still Giving Iran Missile Help — Netanyahu," *Reuters*, November 13, 1997.

[138] Hearing, *Proliferation: Russian Case Studies*, p. 15.

[139] *Ibid.*, p. 3.

[140] *Ibid.*, p. 5.

[141] *Ibid.*, p. 16.

[142] *Ibid.*, p. 35.

[143] *Ibid.*, p. 6.

[144] *Ibid.*, p. 44.

[145] *Ibid.*

[146] Steve Rodan, "Israel Ban on Russian Sales Excludes Defense Business," *Defense News*, Sep. 22-28, 1997, p. 3.

[147] Bill Gertz, "U.S., Israel Target Missile Aid to Iran," *Washington Times*, September 13, 1997, p. A1.

[148] "Israel to Deploy Arrow Missile a Year Early," *Jane's Defence Weekly*, November 12, 1997.

[149] U.S. Senator Jon Kyl, press release, "Sen. Kyl and Rep. Jane Harman Urge President to Act to Stop Russian Missile Sales to Iran," September 30, 1997.

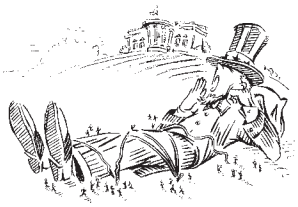
[150] U.S. Congress, Congressional Record, 105th Cong., 1st Sess., 1997, p. S12064, and U.S. Congress, Congressional Record, 105th Cong., 1st Sess., p. H10123.

[151] Library of Congress Web Site, "Bill Summary and Status for the 105th Congress," http://thomas.loc.gov/HR2159, December 8, 1997. The Act was adopted by the House and Senate on November 13, and signed into law by the President on November 26, 1997.

[152] *Ibid.*

[153] *Ibid.*

[154] "Those Iranian Missiles," *Washington Post*, September 30, 1997, p. A20.



North Korea

Few facts leak through North Korea's closed borders. But one has earned it an international reputation — the exporting of missiles. While North Korea does not figure in the nuclear, biological, or chemical weapons export markets, it has emerged as a principal supplier of ballistic missile technology. The North's sales of complete missiles and the means to produce them have made rogue nation buyers increasingly self-sufficient and less vulnerable to supply disruptions in their missile programs. The supply of production technology may even have enabled some rogue states, like Iran, to become suppliers of missile equipment themselves. A recent report to Congress by the Director of Central Intelligence (DCI) notes that in 1996, Iran was an "...important supplie[r] of Scud-related equipment and materials" to Syria.[1]

America's ability to punish North Korea for proliferation is limited due to the strong actions taken in the past to isolate Pyongyang. The U.S. maintains an economic embargo on the North and does not have diplomatic relations with the Democratic People's Republic of Korea. These conditions rendered the Clinton Administration's proliferation-related sanctions on two North Korean organizations in June of 1992, and a third group in May of 1996, purely symbolic.[2] The United States does, however, have significant positive leverage, or incentives, which, if used appropriately, could influence North Korean behavior. Pyongyang's interest in them may increase as its economy declines and famine worsens.

In addition to ballistic missile sales, North Korea's extensive nuclear, biological, chemical, and ballistic missile programs are of great concern. As the DCI noted in his recent report to Congress, these programs are "largely indigenous," and without significant foreign support.[3] The North has concentrated for several decades on the size and strength of its military, resulting in one of the five largest armed forces in the world, with over one million active duty personnel.[4]

Chemical & Biological Weapons Programs

Since the late 1980's, North Korea has reportedly expanded its chemical weapons program and has placed a high priority on military and civilian chemical defense. According to the U.S. Department of Defense, Pyongyang is currently capable of producing large quantities of nerve, blister, and blood chemical warfare agents.[5] The North's biological weapons program has been active since the 1960's, and is believed to be capable of producing limited quantities of toxins and infectious agents.[6]

Nuclear Program

North Korea's nuclear program began in the 1960's, when it acquired a small research reactor from the Soviet Union. By the early 1990's, North Korea developed a complete nuclear fuel cycle which produced plutonium using a 5-megawatt (electric) reactor. According to a Pentagon report published in 1996, "[t]his plutonium reactor became operational in 1986, with some refueling in 1989, thereby providing weapons-grade plutonium for at least one nuclear weapon. Fuel from this reactor was discharged in May-June 1994 and, had it been reprocessed, could have provided enough plutonium for several additional nuclear weapons." The report noted the construction of a much larger 50-megawatt (electric) reactor was nearing completion in the early 1990's which "...would have produced enough plutonium for North Korea to build an additional 7-10 nuclear weapons per year."[7]

In October of 1994, North Korea and the U.S. signed the Agreed Framework under which Pyongyang agreed to freeze its nuclear program in exchange for various benefits. Under the terms of the agreement, the North must freeze and eventually dismantle its graphite-moderated reactors, cooperate in finding a safe method to store existing spent fuel, remain a party to the Nuclear Nonproliferation Treaty (NPT), and allow International Atomic Energy Agency (IAEA) monitoring of its nuclear facilities.[8]

In return, Pyongyang will receive two 1,000 megawatt (electric) light-water nuclear reactors to be completed by 2003, U.S. liaison offices as a step toward establishment of diplomatic relations and relaxation of the economic embargo, and shipments of "heavy oil" (50,000 tons in 1995 and 500,000 tons annually, beginning in 1996 and until the first light-water reactor is built, enough to meet 20 percent of the North's fuel needs). South Korea and Japan will finance most of the estimated $6 billion reactor cost.[9]

Missile Program

North Korea's efforts to develop and produce ballistic missiles appear to have begun in earnest in the early 1980's, when Pyongyang started to reverse-engineer Scud-B ballistic missiles.[10] By 1986, the North was producing the 300 kilometer range Scud-B and reportedly began exporting it the following year.[11] Pyongyang also has developed an extended-range variant of the Scud-B, called the Scud-C, with a range of 500 kilometers which it has exported since the early 1990's. North Korea can target all of the South with its several hundred deployed Scud-B and C missiles.[12]

"Unlike U.S. missiles which require capability for surgical strikes, the North Korean missiles are not designed for such surgical precision. What they are targeting is a general region rather than specific facilities."

– Col. Choi Ju-hwal
North Korean Defector

The North began development of the 1,000 kilometer range No Dong ballistic missile in the early 1990's.[13] While it has been flight-tested only once, in May of 1993, North Korea may have started to deploy the missile. On September 27, 1997, the *Washington Times* reported that according to Admiral Joseph Prueher, Commander-in-Chief of U.S. forces in the Pacific, North Korea is deploying military units with equipment designed to carry the No Dong.[14] According to Admiral Prueher, troops and trucks apparently for handling the No Dong have been observed in North Korea. But the missiles themselves are evidently not fielded yet. When deployed, the No Dong's 1,000 kilometer range will put nearly all of Japan within reach. At a Senate hearing in October, North Korean defector Colonel Choi Ju-hwal explained why North Korea developed Scud and No Dong missiles, stating, "[i]f a war breaks out in the Korean Peninsula, the North's main target will be the U.S. forces based in the South and Japan, which is the reason the North has been working furiously on its missile programs."[15]

North Korea is also developing the Taepo Dong 1 missile with an estimated range of 2,000 kilometers which will be capable of targeting U.S. military bases in Guam, and the Taepo Dong 2 missile, with an estimated range of 4,000-6,000 kilometers that could reach parts of Alaska and Hawaii.[16] Neither missile has been flight-tested, and, according to Deputy Assistant Secretary of State Robert Einhorn, the U.S. believes these missiles are in the "early stage of development."[17] Colonel Choi testified the "...ultimate goal for the development of North Korean missiles is to reach the mainland of the United States."[18] Choi also explained that North Korea does not conduct extensive testing of its ballistic missiles because "unlike U.S. missiles which require capability for surgical strikes, the North Korean missiles are not designed for such surgical precision. What they are targeting is a general region rather than specific facilities."[19] In the same hearing Ko Young-hwan, a former North Korean diplomat who defected in 1991, quoted the former Deputy Minister of the North Korean armed forces as saying "once North Korea develops rockets with a range of 1,000 kilometers, it is not so difficult to develop rockets with a range of 5,000 or over 10,000 kilometer range."[20]

Missile Exports

North Korea's missile program appears to be fueled in large part by a desire to earn critically needed hard currency and bartered goods, such as oil, from missile sales to countries in the Middle East.[21] Roughly the size of the state of Mississippi, the North has few natural resources or exportable commodities. Missile sales have therefore played a key role in the declining North Korean economy. As former diplomat Ko Young-hwan noted in Senate testimony, "[e]xporting missiles is crucial to the North Korean economy."[22]

According to Deputy Assistant Secretary Einhorn, these sales have earned the regime almost $1 billion over the past decade.[23] At a Senate hearing in October of 1997, Senator Thad Cochran observed, "[b]allistic missiles are essentially North Korea's only cash crop. Because of its dire economic situation, it is not likely that North Korea will be dissuaded from marketing that crop."[24]

Since the 1980's, North Korea is said to have sold at least 370 complete Scud-B and C missiles, their components, and production technology, mostly to Iran, which has purchased both complete Scuds and the means to produce them.[25] Iran used them extensively during the "War of the Cities" with Iraq.[26] In fact, earnings from the sale of ballistic missile technology to Iran are believed to be one of the key factors that fueled the rapid pace of North Korea's missile program, enabling the regime to devote far greater resources to the development and production of missiles than would have otherwise been possible.[27]

"Ballistic missiles are essentially North Korea's only cash crop. Because of its dire economic situation, it is not likely that North Korea will be dissuaded from marketing that crop."

– Senator Thad Cochran

As a result, North Korea has allowed Iranian missile experts and technicians wide access to the North's missile program.[28] Syria, too, purchased complete Scuds and production equipment from North Korea. In addition, former North Korean Army Colonel Choi testified that Pyongyang has been engaged in joint missile development with Egypt since the early 1980's.[29]

Despite the Clinton Administration's attempts to moderate North Korea's behavior, it continues to be an active proliferator, as noted in the DCI's report to Congress in June of 1997 which stated, "North Korea continued to export Scud-related equipment and materials to countries of concern [in the last half of 1996]." Thus far, while the North does not appear to have sold complete No Dongs, despite offering to sell them to nations in the Middle East like Iran and Libya, the Shahab-3 under development in Iran — with a range of 1,300 kilometers — is reportedly based on the No Dong.[30] Pyongyang undercut its own market with sales of Scud production technology to Iran and Syria, so it may now feel economically impelled to sell the longer range No Dong and Taepo Dong missiles to generate hard currency earnings.[31] Moreover, Russia, a recent direct missile technology vendor to the Middle East, is cutting into North Korea's market share, as well.

U.S. Missile Negotiations with North Korea

As part of the 1994 Agreed Framework, the U.S. linked closer ties with North Korea to progress in halting exports of missile technology.[32] The Clinton Administration first proposed talks on missile issues in 1995, which North Korea rejected for about a year before eventually agreeing to meet in Berlin in April of 1996.[33] According to Assistant Secretary of State Winston Lord, the United States offered to end economic sanctions in exchange for cessation of development and sales of ballistic missiles. The North did not accept, but Lord said Pyongyang, "...expressed a greater willingness to negotiate on the issue of missile exports than limiting its weapons development."[34]

U.S. and North Korean diplomats held a second round of talks in June of 1997, and were scheduled to meet again in August when Pyongyang abruptly withdrew to protest the Administration's decision to grant asylum to two North Korean diplomats.[35] The diplomats, North Korea's ambassador to Egypt and his brother, a trade official at Pyongyang's mission in Paris, reportedly defected with the help of American intelligence agents.[36] U.S. officials are currently seeking to reschedule the talks, but the North Koreans have not agreed to a new date.[37]

Conclusion

North Korea's deployed missile force and its efforts to develop and sell longer-range No Dong and Taepo Dong 1 and 2 missiles threaten U.S. forces and allies abroad. In a conflict, the North could use them with mass destruction warheads to attack U.S. and allied military bases in South Korea. To interdict reinforcement of

U.S. forces on the Korean Peninsula, these missiles could also target Japan and Guam. In addition, the Taepo Dong 2 missile will reportedly have sufficient range to reach parts of Alaska and Hawaii. Exports of No Dong or Taepo Dong missiles to the Middle East would enable rogue nations like Iran, Syria, and Libya to target U.S. allies and forces in Europe and Israel, and perhaps even the United States.

The Agreed Framework appears to have frozen North Korea's nuclear program, but at great cost, as the provision of light-water reactors may enable Pyongyang to continue its nuclear weapons program. These reactors can produce plutonium for nuclear weapons should Pyongyang evade or renounce IAEA monitoring and master the techniques necessary to process the material produced by the light-water reactors. The U.S. Department of Energy confirmed the possibility in 1994, stating, "[a] successful test was conducted [in the United States] in 1962, which used reactor-grade plutonium in the nuclear explosive in place of weapon-grade plutonium. The test confirmed that reactor-grade plutonium could be used to make a nuclear explosive."[38]

North Korea's dedication to its international agreements is at best suspect. At a Senate hearing in October, former North Korean Army Colonel Choi Ju-hwal, who defected in 1995, testified, "...the reason why North Korea joined the [NPT] at the beginning was to earn more time for the development of the nuclear weapons."[39] Another key weakness of the Agreed Framework allows North Korea to retain already produced fissile material, enough to produce at least one nuclear weapon.

The United States has a limited number of points of leverage on a country that has little interaction with the rest of the world and appears to be unmoved by the condition of its citizens. Although Pyongyang is diplomatically isolated, the U.S. is unlikely to be able to generate sufficient international support for additional sanctions. Under the Agreed Framework the U.S. agreed to provide annually 500,000 tons of heavy oil, 20 percent of North Korea's required fuel. Threats of delays in its supply, or in the construction of the light-water reactors, could temper North Korean behavior, though this tactic could, of course, be used in precisely the same way by Pyongyang against the United States, and probably with better results for the North.

The United States can and should attempt to interdict North Korean missile shipments en route to customers in the Middle East. This would slow the spread of missile technology, but not eliminate the problem. As the DCI noted in a recent report to Congress, "[i]nterdiction efforts are an extremely important part of our overall nonproliferation strategy. By themselves, however, they generally do not get countries out of the business of proliferation. They do, though, buy time for other initiatives that may be more successful in halting or rolling back a WMD program."[40]

Determined proliferators like North Korea can find ways to evade or circumvent interdiction attempts. Only the most stout-hearted administration will routinely assert its right to seize or detain arms shipments which threaten the world. Bush Administration attempts at an aggressive interdiction policy illustrate both its usefulness and limitations. In the early 1990's, the U.S. and Israel successfully deterred North Korea from completing delivery of Scud missile cargo to Syria. In 1991, U.S. intelligence agencies reportedly monitored preparations to ship Scuds to Syria on a North Korean freighter called the Mupo.[41] The information was apparently shared with Israel which anticipated the ship's passage through the Suez Canal. An Israeli Boeing 707 electronic surveillance aircraft patrolled the Red Sea, along with gunboat patrols threatening to sink the vessel.[42] After press disclosures of the shipment and the Israeli response, the vessel changed course, visited several African ports, and returned to North Korea with its cargo.

Other interdiction attempts have been less successful. In early 1992, U.S. intelligence agencies discovered North Korean plans to ship Scud-C missiles and production equipment to Syria via Iran on a freighter named the Dae Hung Ho.[43] After the ship sailed, U.S. officials announced that American warships would intercept and board it if it attempted to enter the Persian Gulf.[44] In testimony to the House Armed Services Committee, Marine General Joseph Hoar, commander of U.S. Central Command, said he was ordered to locate and intercept the freighter, last spotted on February 28, 1992 south of Sri Lanka headed toward the Arabian Sea.[45] The General said he used land-based P-3 Orion reconnaissance aircraft, H-3 Sea King helicopters, and F-14 fighters with photographic pods from a carrier battle group to look for the Dae Hung Ho. He concentrated the search in the

Gulf of Oman, near the entrance to the Persian Gulf, but moved it west and south after determining, "...within a reasonable degree of certainty that it was not already in the Gulf of Oman." But despite a concentrated effort over 10 days to locate the ship on 800,000 square miles of water, it eluded detection and docked in Bandar Abbas, Iran in early March. "We were unable to locate that ship, clear and simple," said General Hoar.

A post-shipment analysis of how the Dae Hung Ho eluded the U.S. naval blockage revealed the freighter had hugged the Iranian coastline, shadowed by Iranian warships, during the final leg of its voyage.[46] In testimony before the House Armed Services Committee, Gen. Hoar said a change in the Navy's search regimen may have allowed the North Korean ship to slip through the U.S. dragnet undetected, and accepted responsibility for the failed interdiction, stating, "[i]f you're looking for the guy who let the [freighter] go through, you're looking at him."[47]

Within a week of the Dae Hung Ho's arrival in Iran, the Iran Salam, another North Korean vessel carrying Scud missiles or components, joined it.[48] The U.S. Navy had located and hailed it, but the ship refused to stop. According to press reports, the Administration was embarrassed by the failure to track the first ship after public threats to interdict the shipment, and quietly decided to let the second vessel dock and unload.[49]

These events illustrate the difficulty of successful tracking and interception of arms shipments. They also show that determined proliferators will change their tactics to elude interdiction. After Israeli threats to sink the Mupo en route to Syria, Pyongyang and Damascus changed their shipping strategies. Iran agreed to receive the North Korean deliveries and tranship them to Syria, eliminating the need for ships to pass through the Suez Canal, a key choke point where the vessels could be detained or easily located.[50] In return, Syria reportedly allowed Iranian Revolutionary Guards to deliver small arms to Hezbollah terrorists in Lebanon.

In spite of its difficulty, interdiction does slow the spread of WMD and missile technologies. The United States should, however, be wary of other policy options like lifting economic sanctions in return for a halt in North Korean missile development and sales. North Korea is called the "Hermit Kingdom" due to its isolation and suspicion of the outside world, and Pyongyang is unlikely to allow for the intrusive monitoring necessary to verify cessation of missile development and sales. As former North Korean Army Colonel Choi testified to the Senate regarding the difficulties involved in monitoring compliance with the Agreed Framework, "I understand the inspection team visited North Korea based on the framework agreement. I do not think they had a chance to inspect underground facilities, and I believe they only inspected the above-the-ground-level facilities and believe all the critical and important facilities are underground. Therefore, they didn't really see anything from my perspective. I believe those underground nuclear facilities will never be open to outsiders under any circumstances."[51]

Furthermore, the North Korean economy appears to be reeling from years of state planning and reports of widespread famine are common. In lifting economic sanctions, the Administration would risk extending the life of a Stalinist regime that shows signs of moving toward collapse. That end may be the best solution to the threat posed by North Korean missile proliferation.

In the meantime, the United States must do what is necessary to protect U.S. forces in the region. As Senator Thad Cochran said after hearing the two North Korean defectors at a recent Senate hearing, "[t]o me, this is more than just a wake-up call. I think it's a call to general quarters. It ought to be considered a grave matter of national security and it requires a response that is appropriate to the level of the threat."[52] America, he added, "...need[s] to take steps to be sure that we have the capability and the systems deployed that will protect U.S. forces and U.S. interests from missile attack and other weapons-of-mass destruction attacks. That to me is the lesson [of this hearing] and why I suggest that it's probably more appropriate to say this should be a call to general quarters and not just a wake-up call."[53]

ENDNOTES

[1] Director Of Central Intelligence Report to Congress, "The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-December 1996," June 1997, p. 5. Hereafter cited as DCI Report.

[2] The National Security Council provided the list of missile sanctions imposed by the United States.

[3] DCI Report, p. 5.

[4] Department of Defense Publication, "Proliferation: Threat and Response," April 1996, pp. 7-9. Hereafter cited as Proliferation: Threat and Response.

[5] *Ibid*., p. 7.

[6] *Ibid.*

[7] *Ibid.*, pp. 6-7.

[8] Larry Niksch, "North Korea's Nuclear Weapons Program," Congressional Research Service, pp. 5-6.

[9] *Ibid.*, p. 7.

[10] "Proliferation: Threat and Response," pp. 7-8.

[11] David G. Wiencek,"Dangerous Arsenals, Missile Threats In and From Asia," Centre for Defence and International Security Studies, Lancaster University, U.K., 1997, p. 21.

[12] "Proliferation: Threat and Response," p. 8.

[13] Wiencek, p. 21.

[14] Bill Gertz, "North Korea cited for missile activity; Preparation, deception are possible," *Washington Times*, September 27, 1997, p. A3.

[15] U.S. Congress, Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, Hearing on October 21, 1997, *North Korean Missile Proliferation*, 105th Cong., Sess. 1, 1997, p. 8. Hereafter cited as Hearing, *North Korean Missile Proliferation*.

[16] "President's Summary: Emerging Threats to North America During the Next 15 Years," *Washington Times*, May 14, 1996, p. A15.

[17] "North Korea developing missiles that could hit Alaska," *Agence France-Presse*, September 19, 1997.

[18] Hearing, *North Korean Missile Proliferation*, p. 20.

[19] *Ibid.*, p. 14.

[20] *Ibid*., p. 4.

[21] Michael Shields, "N. Korea meeting hailed by U.S.," *Washington Times*, April 22, 1996, p. 4.

[22] Hearing, *North Korean Missile Proliferation*, p. 13.

[23] "North Korea developing missiles that could hit Alaska," *Agence France-Presse*, September 19, 1997.

[24] Hearing, *North Korean Missile Proliferation*, p. 2.

[25] "Report numbers Scuds N. Korea sold to Iran," *Washington Times*, July 12, 1996, p. A17 and "North Korea Developing Missile That Could Hit Alaska," *Agence France-Presse*, September 19, 1997.

[26] Wiencek, p. 22.

[27] *Ibid.*

[28] Greg Gerardi and Joseph Bermudez Jr., "An Analysis of North Korean Ballistic Missile Testing," *Janes Intelligence Review*, January 27, 1995, p. 189.

[29] Hearing, *North Korean Missile Proliferation*, p. 16.

[30] "Report numbers Scuds N. Korea sold to Iran," *Washington Times*, July 12, 1996, p. A17; "North Korea developing missile that could hit Alaska," *Agence France-Presse*, September 19, 1997; Wiencek, p. 21 and "Proliferation: Threat and Response," p. 9.

[31] "Report numbers Scuds N. Korea sold to Iran," *Washington Times*, July 12, 1996, p. A17 and "North Korea Developing Missile That Could Hit Alaska," *Agence France-Presse*, September 19, 1997.

[32] "North Korea Developing Missile That Could Hit Alaska," *Agence France-Presse*, September 19, 1997.

[33] R. Jeffrey Smith, " U.S., North Korean Officials to Meet on Missile Sales," *Washington Post*, April 19, 1996, p. A28 and Bill Gertz, "U.S. will pull sanctions if Pyongyang halts missile program," *Washington Times*, June 5, 1996, p. A20.

[34] Bill Gertz, "U.S. will pull sanctions if Pyongyang halts missile program," *Washington Times*, p. A20.

[35] "U.S. and North Korea Begin Missile Talks," *New York Times*, June 13, 1997, p. A15 and Steven Lee Myers, "North Korea Quits Arms Talks Over Defections," *New York Times*, August 28, 1997, p. A1.

[36] Myers, p. A1.

[37] "North Korea developing missile that could hit Alaska," *Agence-France Presse*, September 19, 1997.

[38] U.S. Department of Energery press release June 27, 1994.

[39] Hearing, *North Korean Missile Proliferation*, p. 21.

[40] DCI Report, p. 1.

[41] Bill Gertz, "Threat forces North Korea ship to return home with Scuds," *Washington Times*, January 24, 1992, p. A3.

[42] *Ibid.*

[43] Bill Gertz, "Iran-bound mystery freighter carried parts for missiles," *Washington Times*, July 16, 1992, p. A3.

[44] Patrick E. Tyler, "U.S. considers boarding Mideast-bound North Korean ships; Vessels carrying Scud-C missiles for Syria and Iran," *New York Times* reprinted in *Orange County Register*, March 6, 1992, p. A24.

[45] "North Korea Ship Eluded 10-Day Dragnet by U.S.; Commander says failure to intercept vessel believed to be carrying Scuds is a big setback," *Washington Post* reprinted in *San Francisco Chronicle*, March 12, 1992, p. A8.

[46] Bill Gertz, "North Korean ship hugged coast to avoid blockade," *Washington Times*, May 18, 1992, p. A6.

[47] "North Korea Ship Eluded 10-Day Dragnet by U.S.; Commander says failure to intercept vessel believed to be carrying Scuds is a big setback," *Washington Post* reprinted in *San Francisco Chronicle*, March 12, 1992, p. A8.

[48] New York Times News Service, "Second ship gets to Iran; U.S. says it can't stop suspected Scud vessel," *The News & Observer* [Raleigh, NC], March 18, 1992, p. A7.

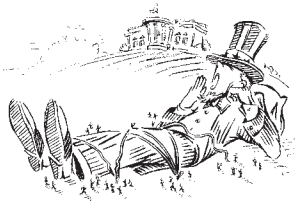
[49] *Ibid.*,

[50] Bill Gertz, "Iran-Syria deal revealed as Scuds near Gulf ports," *Washington Times*, March 10, 1992, p. A3.

[51] Hearing, *North Korean Missile Proliferation*, p. 22.

[52] *Ibid.*, p. 13.

[53] *Ibid.*



United States

Proliferation is not limited to China, Russia, and North Korea. By relaxing controls over the export of dual-use goods, several western nations, including the United States, are enabling others to acquire or improve weapons of mass destruction technology and missile delivery platforms.

This chapter examines policies of the Clinton Administration that have led to the export to proliferators of high performance computers and their possible effect on American national security.

During the Cold War the wisdom of not exporting militarily useful goods to America's enemies was commonly accepted in the United States. This policy extended not just to technologies and systems whose sole application is military – America's long-range ballistic missile manufacturers, for example, didn't try to sell these weapon platforms to the USSR – but also to the sale of "dual-use" goods, technologies having both military and civilian applications.

Notwithstanding the natural tension in any free society between trade and export controls, the western export control regime COCOM – the "Coordinating Committee for Multilateral Export Controls" – was a success. At best it denied, and at least made more complicated and difficult, the transfer of significant dual-use technologies to the Soviet Union and its allies. Founded in 1949, COCOM, which consisted of Japan, Australia, and all the NATO countries except Iceland, acted on the basis of consensus among its members.

President Clinton won election in 1992 promising America's manufacturers he would make dual-use exporting easier. The Clinton campaign's policy paper – *Technology: The Engine of Economic Growth*[1] – "drafted by Apple [Computer] executives and others [in California's Silicon Valley]"[2] said, "[e]xport controls are necessary to protect U.S. national security interests and prevent the proliferation of nuclear, biological and chemical weapons. Nonetheless, these controls are often overly restrictive and bureaucratic, creating a mountain of red tape and costing the U.S. tens of billions of dollars in exports – while undermining the competitiveness of the high-tech industries on which our national security depends."[3] It also said the United States should "[f]urther liberalize East-West export controls that are unnecessary given the end of the Cold War."[4] Less than one year after entering office, President Clinton assured the Chairman and CEO of computer manufacturer Silicon Graphics, Edward McCracken, he was "...currently engaged in seeking major reforms to COCOM, which should lead to significant liberalization of [export] controls on computers, telecommunications, and machine tools…."[5]

President Clinton's "major reform" to COCOM was its dissolution. COCOM's consensus approach, which gave the United States a veto over proposed dual-use exports of other nations, was apparently viewed as an "unnecessary" export control. This veto authority required COCOM member nations to harmonize controls on sensitive technologies and eliminated the competitive business pressures on countries to "interpret" COCOM's requirements in some convenient way to give their domestic industries an advantage over those of other nations. COCOM died on March 31, 1994, over two years before the establishment, on July 12, 1996, of its successor, the Wassenaar Arrangement (short for the "Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies"). Unlike its predecessor, Wassenaar allows each member to determine for itself whether to allow an export to proceed. No member can veto another's exports. Where COCOM consisted of consensus before the fact, Wassenaar consists of reports after the fact.

Why Control Supercomputer Exports?

High performance computers are increasingly important in the development of more capable weapons and platforms. According to the Department of Defense, "High Performance Computing (HPC) is a key enabling technology that is essential to maintain and extend the United States' technological advantage in warfighting systems."[6] The Pentagon's program to modernize its supercomputers "…is the major force designed to improve the Department of Defense's (DoD) ability to ex-

ploit the computation necessary to sustain technological superiority on the battlefield."[7]

The 1991 Gulf War ingrained the importance of advanced technology in the minds of civilian and military leaders the world over. Just as the United States intends to use supercomputers to "maintain and extend" its military technological lead, other nations are interested in using this key enabling technology to design and acquire weapons and platforms more advanced than currently in their inventories. As Richard Bernstein and Ross Munro note in *The Coming Conflict With China*, "China's overall economic strategy is also aimed at enhancing the acquisition of the most advanced Western technology, including 'dual use' technology that can be used for both civilian and military purposes."[8]

Of course, as Deputy Assistant Secretary of Defense Mitchel Wallerstein pointed out in Senate testimony, "…the original designs for the first U.S. nuclear weapons were done on slide rules or on very primitive calculating machines."[9] Weapons can and have been developed without supercomputers, but according to Dr. Peter Leitner, a strategic trade advisor in the Pentagon's Defense Technology Security Administration,

> The relationship of computers and advanced machine tools to the proliferation problem is often posed in simplistic terms: *Since the U.S. did not need computers or computer-controlled machine tools to develop nuclear weapons and ballistic missiles, there is little need to control either technology for these purposes* (emphasis in the original). The argument ignores the fact that computers and computer-controlled machine tools have become an essential tool for many activities that were previously accomplished either by secretly amassing dozens of Nobel laureates, supported by hundreds of top physicists, in the mountains of New Mexico for several years or by metalworking artisans fashioning unique parts for small lot production. Computers and computer-controlled machine tools have made themselves central by defining the very way technical goals are accomplished, and can substantially enhance the effectiveness of the limited pool of talent often available to a proliferant country while providing the capability for mass production of highly effective weapons systems.[10]

Today's high performance computers can reduce a weapon system's development time, make it more capable, and increase the user's confidence in it.

Confidence is critical for nuclear weapons, which are rarely, if ever, tested. The report used by the administration as its basis for liberalizing U.S. export controls on high performance computers, commonly referred to as the "Goodman Report," says, "...continued export controls will slow the exacerbation of existing nuclear threats. Control of HPC exports, by limiting those exports or imposing appropriate safeguards, to countries known to possess nuclear weapons will impede their development of improved weapons and reduce their confidence in their existing stockpile by limiting the opportunity to conduct simulations in lieu of live tests. Similar or more rigorous controls on HPC exports to countries with nuclear weapons development programs could impede their development of second-generation weapons."[11] This finding of the Goodman Report was no surprise: It followed a 1986 report entitled, "The Need for Supercomputers in Nuclear Weapons Design," in which the Department of Energy concluded, "[t]he use of high-speed computers and mathematical models to simulate complex physical processes has been and continues to be the cornerstone of the nuclear weapons design program."[12]

As valuable as supercomputers are for nuclear weapons, particularly in an era of diminished testing, they are also integral to the development of conventional weapons and delivery systems like ballistic missiles. The Goodman Report calls conventional weapons programs "...today's 'bread and butter' of high-performance computing applications in the U.S. national security community. The design and development of advanced conventional weapons (ACW) has developed a symbiosis with high-performance computing: programs are often defined on the basis of the current or projected state of the art in HPC, and new computer hardware and software are frequently developed in response to program requirements…."[13]

The Defense Department's *High Performance Computing Modernization Plan* underscores this point, citing projects such as the Airborne Laser Challenge Project, B-1B Radar Cross Section Prediction, Design of New Materials Using Computational Chemistry, and Modeling of Complex Projectile-Target Interactions as examples of the Pentagon's supercomputer "Challenge Projects" for fiscal year 1997.[14]

America and its allies have already faced their own technology in war. According to Dr. William Schneider, Under Secretary of State for Security Assistance, Science and Technology from 1982 to 1986, "[t]he decontrol of advanced civil sector ('dual use') technology among the industrialized nations of the world was the enabling policy change which contributed to Iraq's indigenous capability for WMD and military missiles."[15] Dr. Stephen D. Bryen, who from 1981-1988 served concurrently as Deputy Under Secretary of Defense for Trade Security Policy and Director of the Defense Technology Security Administration, said, "[i]n the case of China, we are transferring much more sophisticated technology than anyone ever sold to Iraq."[16] Bryen also noted, "China is seeking to enhance its nuclear weapons and their delivery systems…Supercomputers are important for China to achieve these goals," while pointing out that, "China can use supercomputers to enhance many other weapons programs."[17]

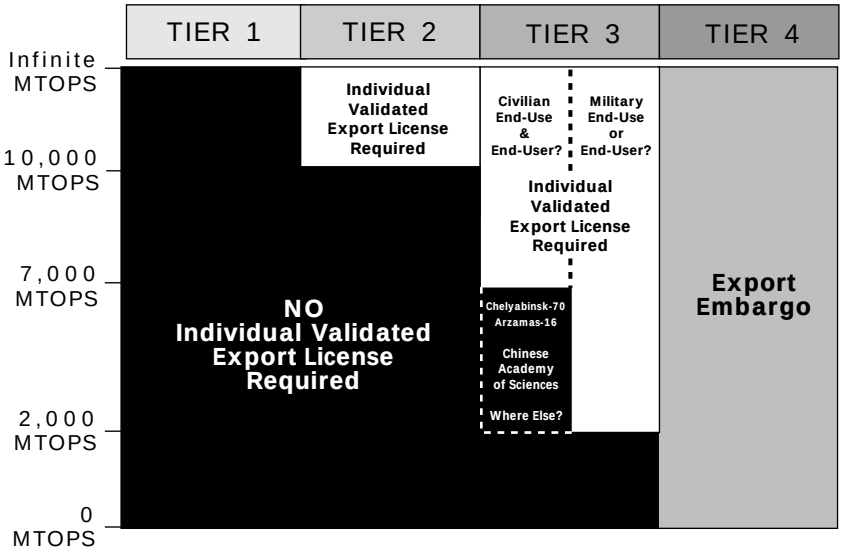
Dr. Leitner summed up the danger presented by dual-use goods going to countries of concern when he testified, "[a]t whatever stage of development, it is in the USG [U.S. government] interest to make a weapon of mass destruction (WMD) and ballistic missile delivery program as difficult, expensive, and unreliable as possible."[17] His statement applies equally to other military programs of nations with interests contrary to those of the United States. Moreover, supercomputers enable nations supplying rogues and others to upgrade more quickly the quality of their products.

The President's Supercomputer Export Decontrols

The Clinton Administration has liberalized export controls on high performance computers in two stages. According to Kenneth Flamm of the Brookings Institute, who served from 1993-1995 as the Principal Deputy Assistant Secretary of Defense for Economic Security and Special Assistant to the Deputy Secretary of Defense for Dual Use Technology Policy, the Administration in 1993 first "…decontrolled computer exports to 500 MTOPS [Millions of Theoretical Operations per Second, a standard measure of computing capability], and imposed after-sale monitoring on only the most powerful computing machines," keeping the "strictest controls" on computers above 1,500 MTOPS.[19]

On October 6, 1995, President Clinton dropped the second shoe, saying he was "...pleased to announce a major reform of our computer export controls that will adjust to the global spread of technology while preserving our vital national security interests."[20] This policy, which took effect on January 25, 1996, groups all nations into four "country tiers" and establishes high performance computer export licensing requirements and exceptions based upon their country of destination, as depicted below.

Supercomputer Licensing Requirements



MTOPS = Millions of Theoretical Operations Per Second

Tier 1 countries, primarily Australia, Japan, and America's NATO allies, may buy high performance computers of unlimited capability from the United States without an individual validated license (IVL); that is, a license granted by the Department of Commerce for a specific supercomputer to be exported only to a specific customer after an executive branch-wide review of the proposed export. The policy effectively establishes a license-free zone for high performance computer exports of unlimited capability to Tier 1 countries without regard to the identity of the end-user or the intended end-use. Tier 1 countries may transfer their American supercomputers among themselves without U.S. government permission.

At the other end of the spectrum, Tier 4 countries – the "terrorist nations" – cannot legally receive any of these computers. According to William Reinsch, Under Secretary of Commerce for Export Administration, "...our limit [to Tier 4 countries] is 6 MTOPS, which eliminates everything."[21]

Almost all of South America, Central America, the Caribbean, and Africa are in Tier 2, eligible for supercomputers capable of up to 10,000 MTOPS – ten billion operations in a second – before an individual validated export license is required. Tier 2 countries can transfer computers without U.S. government permission within Tiers 1 and 2.

The policy for the 50 Tier 3 countries, which includes China and Russia, is more complicated. Tier 3 policy requires an individual validated license granted by the Department of Commerce under only two circumstances. First, if the computer is capable above 2,000 MTOPS and is going to a military end-use or end-user, or second, if the computer to be exported is capable above 7,000 MTOPS. No individual validated export license is required for manufacturers vending supercomputers capable between 2,000 and 7,000 MTOPS to buyers in Tier 3 countries when there is to be a civilian end-use and end-user. The exporter, rather than the Department of Commerce, determines whether the purchaser's end-use and user representations are accurate. In transferring end-use and user determinations to industry, the Clinton Administration policy puts American exporters on the honor system. They police themselves supposedly to the point of denying themselves sales. This transfer of responsibility from government to industry is the embodiment of the Clinton-Gore campaign pledge to "[s]treamline the current decision-making process for export controls."[22]

End-Use and User Determinations: Too Great a Burden for Industry?

According to Victor Mihailov, Russia's Minister of Atomic Energy, Russia obtained American supercomputers that will be used to simulate nuclear explosions and are "10 times faster than any previously available in Russia."[23] These exports clearly contravene the lenient new policy of the Clinton Administration. In fact, when IBM and Hewlett-Packard earlier requested specific individual validated licenses to export supercomputers to one of Russia's nuclear weapons labs, according to Secretary Reinsch, "[w]e declined to approve those licenses."[24]

The five computers Mikhailov spoke of are located in Russia's two premier nuclear weapons labs, Chelyabinsk-70 and Arzamas-16.[25] Four of these American supercomputers came from Silicon Graphics, the California company headed by Edward McCracken, while the fifth is an IBM. According to McCracken, it was his company's understanding that "the computers were for environmental and ecological purposes,"[26] demonstrating how shifting the end-use and user determination burden from government to industry can work.

It seems that Silicon Graphics should have been able to determine that selling supercomputers to Russia's nuclear weapons labs went beyond the new supercomputer export decontrols. According to Professor Gary Milhollin, Director of the Wisconsin Project on Nuclear Arms Control, "[i]n a memorandum dated January 15, 1997, which Silicon Graphics sent to the Commerce Department, Silicon Graphics admitted that it sold the computers to the 'All-Russian Scientific Research Institute for Technical Physics (VNIITF),' which is the official name for Chelyabinsk-70." The World Wide Web homepage giving the mission of Chelyabinsk-70, found by searching for "VNIITF," is shown below.[27] Moreover, in testimony before the House National Security Committee, Professor Milhollin noted that, "[i]n May 1995, the Commerce Department's Bureau of Export Administration published *The Russian Defense Business Directory*, a guide to acquaint American exporters with Russia's military sites. The guide listed Chelyabinsk-70's 'product line' as the 'development of nuclear weapons.'"[28]

According to its web page, the "Russian Federal Nuclear Center – All-Russian Research Institute of Technical Physics (RFNC-VNIITF)…is under the authority

of the Ministry of Atomic Energy of the Russian Federation…." If that doesn't suggest nuclear activity, other entries should. The first of the RFNC-VNIITF's "main scientific directions" is "the development of techniques and equipment provided to record explosion processes, including nuclear ones." Another of its "main scientific directions" is "investigation, development, and test of powerful explosives." If these clues aren't sufficient to put an exporter on notice, the last sentence on the page should be: "At present about 50% of the investigators, engineers, and workers are oriented to solve pure peaceful problems."

According to the *New York Times*, "…China has gone on a shopping spree" in buying American supercomputers.[29] Says the Chinese Academy of Sciences – which works on everything from the D-5 ICBM, capable of reaching the United States, to uranium enrichment for nuclear weapons – its new Silicon Graphics "Power Challenge XL" supercomputer provides the Academy with "computational power previously unknown," available to "all the major scientific and technological institutes across China."[30] (The U.S. Department of Defense also uses Silicon Graphics "Power Challenge"

supercomputers in its High Performance Computing Modernization Program.)[31] According to Silicon Graphics, this computer is the "most powerful SMP [symmetric multiprocessor] supercomputer in China."[32]

The *New York Times*, citing "American Government officials who requested anonymity," said, "[t]he supercomputers sold to China would allow the country to significantly improve its nuclear weapons by processing huge amounts of data from very small underground nuclear weapons tests. These tests are currently banned by international treaty, but the high-performance computers would allow the Chinese to conduct weapons tests with explosions so small that they would be undetectable by outsiders…."[33]

While some of its scientific and technological institutes are not working for the People's Liberation Army (PLA), the Chinese Academy of Sciences' participation in defense programs and its status as a military-end user is not a closely held secret. Indeed, when asked in a Subcommittee hearing about the Chinese Academy of Sciences' involvement in upgrading China's nuclear weapons and missile technology, Commerce's Reinsch responded, "…that is something that the intelligence community has looked into in considerable detail. We have information on that, but it is classified and I can't provide it to you in open session."[34] Thus, PLA generals seeking new hardware with which to challenge America's interests in Asia in the next century will benefit directly from American technology freely exported by Americans.

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But there are end-users with less obvious backgrounds than Chelyabinsk-70, Arzamas-16, or the Chinese Academy of Sciences. In June of 1997 the Director of Central Intelligence (DCI) sent Congress a report entitled *The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions*.[34] The unclassified report covers the period July through December of 1996 and levies serious proliferation charges against, among others, Russia and China. According to the DCI, "[m]any Third World countries – with Iran being the most prominent example – are responding to Western counterproliferation efforts by relying more on legitimate commercial firms as procurement fronts and by developing more convoluted procurement networks."[36] U.S. exporters are not capable of determining (and shouldn't be), except in the clearest instances, which purchasers are "procurement fronts." It is wrong to place this burden on industry. That is what America's intelligence agencies are paid to do. As Senator Glenn said on the Senate floor, "[t]here are significant limitations in the extent to which the Government can delegate export control responsibilities to the private sector. Companies simply do not have the capabilities of U.S. intelligence agencies. That is the reason why licensing is such a good idea. It is the best known technique for making efficient and effective use of the resources of our Government… to assess the proliferation risks in certain exports."[37]

The Administration's Solution

According to Commerce Under Secretary Reinsch, if a company has a question about the legitimacy of a prospective purchaser, it "…can always consult with us…."[38] But, what about a company that seeks information on its own about a buyer and finds no military connection? What reason will it have under Administration rules to consult the Department of Commerce? The most thorough search by an exporter with limited resources may not expose a prospective purchaser's military-related activities if they are buried in a U.S. intelligence agency compartment or if a front company is being used to procure the computer.

To obviate even the occasional inquiry from industry, the Department of Commerce proposes publishing a list of prohibited end-users. The administration and some in the computer industry insist that the solution to industry's difficult problemlies in a published list of suspect end-users. Sales to listed entities would not be prohibited by law but an individual validated license would be required. This acknowledges that American supercomputers shouldn't be in Russia's and China's nuclear weapons design labs, among other places, but the implementation of the proposal would do more harm then

good. Any published list would necessarily be incomplete, for a complete list inevitably would compromise U.S. intelligence sources and methods. According to Commerce Under Secretary Reinsch in Senate testimony, "We have not done it [publish a list] extensively so far. There are intelligence sources and methods issues that come up frequently, as well as some other considerations."[39] Mr. Reinsch went on to say, "…frequently we don't publish for that reason, even though we have identified someone that, for other reasons, ought to be published."[40]

Senator John Glenn observed problems with this policy when he said on the Senate floor, "…such a listing could be quite useful to a proliferant country or group, effectively amounting to free market research for the proliferators."[41] Any published list would be easy to manipulate by both purchaser and exporter if they are not devoted to the honor system. If Chelyabinsk-70 is on the list of suspect locations, can a "Chelyabinsk-71," not on the list, receive U.S. exports of high performance computers? An exporter could decide Chelyabinsk-70 does nuclear weapons work, but "Chelyabinsk-71" conducts only environmental research. This type of list might even increase exports to those who ought not to have them.

The Department of Commerce has published such a list, most recently on October 1, 1997, consisting of 15 locations in China, Russia, India, Pakistan, and Israel.[42] Called by Commerce the "Entity List," it alerts the public that "[t]hese end users have been determined to present an unacceptable risk of diversion to developing weapons of mass destruction or the missiles used to deliver those weapons. Publishing this list puts exporters on notice that any products sold to these end users may present concerns and will require a license from the Bureau of Export Administration. While this list will assist exporters in determining whether an entity poses proliferation concerns, it is not comprehensive."[43]

Only a casual inspection reveals its inadequacy. On this list are Chelyabinsk-70 and Arzamas-16 in Russia and parts of the Chinese Academy of Sciences, all of which are currently using American supercomputers. Because of this list, America's computer exporters now know that they need a license to ship a high performance computer to any of these entities. But where is the Chinese company, really part of China's government, which shipped the specialized ring magnets to Pakistan for use in its nuclear program? What about the Chinese company, or government entity, that shipped M-11 missiles to Pakistan and now, according to press reports, is helping Pakistan build a factory for the indigenous manufacture of M-11 missiles? Why isn't that entity on the list? What about the Russian companies or government entities which are helping Iran upgrade its nuclear and ballistic missile programs? Why aren't they on the list?

This list only adds to the confusion. It is not a solution to the problem.

Enter Congress

In 1997 Congress addressed a perceived deficiency in the President's 1995 supercomputer export policy by including language in the fiscal year 1998 Defense Authorization Act (Public Law 105-85) shifting the end-use and user determination burden back to government.[44] The publication *Inside U.S. Trade* described this legislation as "…a rollback of the Administration's 1995 relaxation of export controls,"[45] while the *Risk Report* labeled it "…the first such roll-back in recent history."[46] Even though other concerns were not dealt with by Congress,[47] it was a clear and unambiguous first step putting national security considerations back into America's export control policy.

The legislation was based on an amendment, introduced by the chairman and ranking minority member of the National Security Committee of the House of Representatives, Congressmen Floyd Spence and Ronald Dellums, which passed the House by a vote of 332-88 on June 19, 1997.[48] While similar legislation[49] was offered by Senators Thad Cochran and Richard Durbin and defeated in the Senate after weeks of lobbying by the Administration and the computer industry, the Cochran-Durbin amendment acquainted Senate conferees on the bill with the problem and led to an agreement in the conference report on the issue.

The legislation, which was signed into law by the President, applies only to U.S. supercomputer exports to Tier 3 countries and contains the following provisions:

1. Exporters must submit for review any proposed Tier 3 sale above the Clinton Administration's 2,000 MTOPS threshold. The review (the government's end-use and user determination) is conducted by the Secre-

taries of Commerce, Defense, State, and Energy, and the Director of the Arms Control and Disarmament Agency within ten days of submission. The exporter must obtain an Individual Validated License (IVL) to export the supercomputer if, during the ten-day period, any of the five finds the proposed sale outside the "license exception" policy announced by the President in October of 1995.

2. Any change by the President to the 2,000 MTOPS threshold for Tier 3 can take effect only 180 days after a report to Congress justifying the change.

3. Any change to the composition of Tier 3 only takes effect 120 days after the President reports to Congress on the reasons for the adjustment.

4. Post-shipment verification (PSV) – checks by U.S. government officials after a supercomputer export is completed to ensure, among other things, that the computer is being used for the purpose originally represented by the purchaser and has not been diverted to some other location – for all Tier 3 exports must be performed, with a report submitted annually to Congress explaining the results of these PSV's.

Senators have described the rationale for this legislation in these ways:

- Senator Thad Cochran: "…a necessary first step to staunch the flow of American-made supercomputers to countries and places they should not be going."[50]

- Senator Thad Cochran: "The Cold War's end does not decrease the need for the continued safeguarding of sensitive American dual-use technology. While there may no longer be a single, overarching enemy of the United States, there is little doubt that many rogue states, and perhaps others, have interests clearly contrary to those of the United States. Helping these nations – or helping other nations to help these nations – to acquire sensitive dual-use technology capable of threatening American lives and interests makes no sense."[51]

- Senator Richard Durbin: "As we are concerned about the proliferation of those items that can be used for the construction of nuclear, biological, and chemical weapons, we should also be concerned about the potential that we are selling technology that can also be used for proliferation of military weaponry…the United States should take care not to sell that technology which allows another country to develop weapons of destruction."[52]

- Senator Strom Thurmond: "The export of the high-performance computers to countries of concern could have a significant and potentially detrimental impact on the United States and allied security interests."[53]

- Senator Carl Levin: "It [the Cochran-Durbin amendment] raises a very significant issue relative to American security."[54]

- Senator John Ashcroft: "How can the United States call on other nations to stop transferring dangerous technology when America is giving China some of the most advanced [computer] technology in the world?"[55]

- Senator John Glenn: "The rapid advancement of this technology has been accompanied by an equally rapid decontrol of some of the very devices we used to make some of the most powerful weapons the world has ever known. The Commerce Department's Bureau of Export Administration, for example, reports in its most recent Annual Report to Congress that – 'Due to the 1994 and 1995 liberalization for computers, this commodity group has been replaced by shotguns as being the most significant commodity group for which export license applications were received in fiscal year 1996.' So it now appears that we are giving closer regulatory attention to shotguns than to a key technology that our top weapons labs have characterized as essential to performing a variety of nuclear-weapons applications."[56]

- Senator John Glenn: "No company…can claim any right under U.S. law to help another country to make nuclear weapons or any other weapons of mass destruction. We have a free economy – but our individual freedom to produce and market goods is not unlimited, especially when it comes to goods that can jeopardize our national security."[57]

Testifying on technology transfer in June of 1997 before the Joint Economic Committee, retired U.S. Army Lieutenant General Robert L. Schweitzer said soldiers are

"…grateful when Congress acts ahead of time to bar technology transfers, not only the simple ones…but the more serious, albeit subtle ones, which can affect the outcome of battles and wars."[58]

Conclusion

The legislation initiated by Congress and signed by the President will not prevent a single supercomputer export to any appropriate foreign entity, but it will help ensure that only those who should have them will have them. The only supercomputer sales this statute blocks are those to foreign entities the U.S. government determines shouldn't have them. It does nothing to impede legitimate sales to legitimate users.

The statute requires the government to determine end-use and user – and apply the law. Nothing else. The composition of the four tiers, the MTOPS thresholds for each tier, and the policy allowing for the export of supercomputers without IVL's based upon the license exceptions established by the President are unaffected.

The issue is broader than placement of U.S.

The Importance of End-Use Checks

End-use checks are comprised of two elements: the pre-license check (PLC) and the post-shipment verification (PSV). Used properly, they can help ensure the legitimacy of exports to Tier 3 countries. According to Commerce's Reinsch in testimony before the Subcommittee, "[t]here is a lot you can discover with prelicense checks. There is a lot you can discover just by wandering around a plant to determine the nature of their real business, which they may or may not want to tell you."[59] For countries where American supercomputers have been diverted or those that have obtained U.S. supercomputers by making improper representations – like China (Chinese Academy of Sciences, military base at Chungsha) and Russia (Chelyabinsk-70, Arzamas-16) – end-use checks should be a critical element of dual-use exporting. And a September 1997 Department of Commerce Inspector General report, entitled *Export Application Screening Process Could Benefit From Further Changes*, notes, "[e]nd-use checks are an important component of the export licensing process."[60]

Secretary Reinsch couldn't be more correct in saying, "…[t]here is a lot you can discover with prelicense checks." And if Mr. Reinsch's Bureau of Export Administration conducted more of them, not to mention post-shipment verifications, Congress would have greater confidence that the Department of Commerce is as concerned about national security as it is about promoting exports.

One would expect that both PLC's and PSV's would be routinely required of countries which have proven by past behavior not to be trustworthy. Instead, they are the exception. According to Secretary Reinsch's testimony in November of 1997, "[t]hus far in 1997, BXA [Commerce's Bureau of Export Administration] has requested 22 post shipment verifications of HPCs exported to Tier 3 countries. Seventeen have been completed, all with favorable results. The remainder of the requests are pending at our embassies."[61] Of the 1,437 supercomputers exported from the United States from the inception of the President's latest decontrol in January of 1996 through some point in March of 1997 (the latest period for which the Commerce Department has provided data), 91 – or 6.34% – went to Tier 3 countries. Of these 91, 47 went to China and ten to Russia, making these two countries the recipients of approximately 63%, nearly two-thirds, of Tier 3 exports for the first 14 months of the President's most recent decontrol.[62]

Astonishingly, not a single supercomputer exported to China had either a pre-license check or a post-shipment verification. In fact, according to Mr. Reinsch on December 11, 1997, "No formal post-shipment verifications have yet been requested to China for the 47 systems exported."[63] For Russia, not one of its ten American supercomputers received a pre-license check and three post-shipment verifications were conducted, though none of these post-shipment checks were for the high performance computers obtained by Chelyabinsk-70 or Arzamas-16.[64]

(Continued on next page)

supercomputers in Russian and Chinese nuclear weapons labs, although State Department Spokesman James P. Rubin has at least said of the Russian labs, "…we believe they [the U.S. supercomputers] are at locations precisely where we didn't want them to be."[72] The United States should not be helping Russia and China to upgrade the quality of the weapons and technology they are proliferating. Director of Central Intelligence George Tenet's report to Congress confirms that "...countries of concern continued last year to acquire substantial amounts of WMD-related equipment, materials, and technology, as well as modern conventional weapons. China and Russia continued to be the primary suppliers, and are key to any future efforts to stem the flow of dual-use goods and modern weapons to countries of concern."[73]

In spite of the weight of the evidence supporting reform of current policy, the President criticized the provisions of the 1998 Defense Authorization Act relating to supercomputer export controls, saying they were an attempt "…to severely limit the President's flexibility to conduct foreign policy…."[74] But America's Constitution does not give the President absolute authority to conduct foreign policy. Article I, Section 8, says, "[t]he Congress

(Continued)

As, per Secretary Reinsch, "[t]he Russian government allowed U.S. Embassy officials to conduct the [three] requested post-shipment verifications,"[65] the Clinton Administration has failed even to request post-shipment verification access to the ill-gotten American supercomputers at Chelyabinsk-70 and Arzamas-16. Thus, of 57 American supercomputers shipped to China and Russia between January 25, 1996 and some point in March of 1997, there were no pre-license checks and three post-shipment verifications (5.3% of the 57).

In countries with histories of proliferation and diversion of computers to improper end-users, no supercomputers should be shipped without a pre-license check, and all should have a post-shipment verification. According to Mr. Reinsch, "BXA has opened four investigations on HPC exports: two involving China and two involving Russia. All these investigations are in the hands of the Department of Justice."[66] As the Commerce Department Inspector General notes in his recent report, "[a] PSV, conducted after an export has occurred, is used to determine whether the licensed item or technology was received by the party named on the license or shipper's export declaration (SED) or was diverted to an unauthorized end user. The check is also used to verify whether the commodity is being used in accordance with the license provisions."[67] It stands to reason that supercomputers shipped under the license exception policy (without an individual validated license) to a country of concern should also receive these post-shipment verifications.

Two conclusions from the Commerce Department Inspector General's report are worth noting. First, though the report was not specific to supercomputers but covered all dual-use goods, its conclusion that the "[q]uality and utility of end-use checks should be improved"[68] is unavoidable given the failure of Commerce to conduct any end-use checks on supercomputers in either China's or Russia's nuclear weapons complexes. Second, Secretary Reinsch "…disagreed with our [Commerce Inspector General] recommendation to screen all parties to export license applications against the TECS [U.S. Customs Service database]. Specifically, their response argued that 'to refer all license applications to Customs for review in TECS effectively makes Customs a referral agency. This would not be consistent with the President's goal to streamline the export licensing process….'"[69] The Commerce Department's Inspector General took exception to Mr. Reinsch's response, stating, "BXA's argument, however, is not convincing."[70]

Because of the casual attitude toward end-use checks by the Commerce Department's Bureau of Export Administration, Congress included a provision in Public Law 105-85 requiring the Secretary of Commerce to "…conduct [a] post-shipment verification of each digital computer with a composite theoretical performance of more than 2,000 millions of theoretical operations per second (MTOPS) that is exported from the United States…"[71] to a Tier 3 country. A statute should not be necessary for the Bureau of Export Administration to conduct comprehensive end-use checks in countries like China and Russia.

shall have Power…[t]o regulate Commerce with foreign Nations…."[75]

Prior to the President's signing the defense authorization bill, Secretary Reinsch also criticized its supercomputer provisions. In testimony before the House National Security Committee, he said, "[t]he requirement to conduct post shipment checks will become an extraordinary resource burden, is unadministrable and unnecessary [emphasis in the original].[76] Remember, from implementation of the President's policy on January 25, 1996, through some point in March 1997, only 91 of 1,437 supercomputers, or roughly 6% of the total, were exported to Tier 3 countries.[77] Conducting 91 post-shipment verifications – an average of 1.5 per week over that 14 month period – doesn't seem to be "an extraordinary resource burden" or "unadministrable."

Administration officials also criticized the 2,000 MTOPS threshold in the legislation, though this level was set not by Congress but by the Administration's policy. But the legislation allows for the 2,000 MTOPS level to be raised 180 days after the Administration provides justification to Congress.

This 180 day review period, criticized by Mr. Reinsch as "…mak[ing] no technological sense,"[78] is an integral part of the legislation precisely because past Administration projections on supercomputers – projections that formed the basis of President Clinton's October of 1995 announcement decontrolling high performance computer exports – have been wrong.

A White House "Fact Sheet" accompanying the President's October 6, 1995, announcement says, "…we conservatively judged that computers up to 7000 million theoretical operations per second (Mtops, a standard measure of computing performance) will become widely available in open commerce within the next two years."[79] And it was this "conservative judgement" that was instrumental in determining the Tier 3 export control policy.

The judgement is not supported by the facts. In testimony before the House National Security Committee on April 15, 1997, Mr. Harold J. Johnson, Associate Director for International Relations and Trade Issues in the Security and International Affairs Division of the General Accounting Office, said, "…the United States or Japan [are] the only countries currently producing computers above that [3,500 MTOPS] level."[80] Secretary Reinsch agreed with the GAO when testifying before the Subcommittee on June 11, 1997, saying, "I cannot, at this point, make a convincing case that that is wrong, Mr. Chairman…. For purposes of this discussion, I am happy simply to assume that that is correct."[81]

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This "wide availability" to the 7,000 MTOPS level suggested by the White House in October of 1995 was based not on foreign availability, but on the ability of U.S. manufacturers to produce such powerful machines. This future production capability appears to have driven the President's policy, not the ability of rogues or other nations to acquire these machines outside the United States. Although GAO's Johnson noted Japan's over-3,500 MTOPS capability, Japan's export restrictions on supercomputers are tougher than those of the United States. Kenneth Flamm, an architect of the Clinton Administration's supercomputer decontrol, even noted that Japan opposed the scope of the decontrol, saying the Administration "…proposed the strictest controls on exports of computers above 2,000 MTOPS (though it was able to negotiate only 1,500 MTOPS in bilateral discussions with Japan….)"[82]

Industry also has been overly optimistic in its predictions. Officials of IBM and Intel, for example, have provided the Subcommittee with conflicting estimates of when a personal computer capable of 2,000 MTOPS will be available. And it is the Intel official – whose company is "…the world's biggest maker of microprocessors, with its chip in 85 percent of all personal computers"[83] – who says the 2,000 MTOPS personal computer will not be on the market nearly as quickly as claimed by IBM.[84]

There is, of course, room for disagreement on when specific thresholds will be crossed. But if the Administration presents a factual case, the flexibility in the legislation signed by the President in November of 1997will make it possible for Congress to agree with proposed threshold changes.

As documented in previous chapters, China and Russia are constantly involved in sales of technology, components, and delivery systems for weapons of mass destruction, as well as sales of highly-capable advanced conventional weapons and other critical military technologies to other nations. The facts support President Clinton's describing the proliferation of weapons of mass destruction and the means of delivering them "...as an unusual and extraordinary threat to the national security, foreign policy, and economy of the United States," and his declaring "a national emergency to deal with that threat."[85] The President has subsequently reaffirmed this executive order annually, most recently on November 12, 1997.

The facts underlying the necessity for this executive order are not based on isolated past examples. A flood of proliferation is reported daily in America's newspapers. Israel has found this threat to be so severe that their leaders are publicly warning America of the dangers. Prime Minister Benjamin Netanyahu, for example, recently said, "Iran is unseen, unperturbed and undisturbed…building a formidable arsenal of ballistic missiles, actually inter-continental ballistic missiles…[that] they actually plan to [be able to] reach the eastern seaboard of the United States, Manhattan."[86] America's own intelligence agencies warn of these problems, too. According to the DCI's June of 1997 report to Congress, "China was the most significant supplier of WMD-related goods and technology to foreign countries. The Chinese provided a tremendous variety of assistance to both Iran's and Pakistan's ballistic missile programs. China also was the primary source of nuclear-related equipment and technology to Pakistan, and a key supplier to Iran during this reporting period. Iran also obtained considerable CW-related assistance from China in the form of production equipment and technology."[87] It also said, "Russia supplied a variety of ballistic missile-related goods to foreign countries during the reporting period, especially to Iran. Russia was an important source for nuclear programs in Iran and, to a lesser extent, India and Pakistan."[88]

Trade is vital to the United States, but not its only interest. National security cannot be subordinated to trade. While a balance must be struck between national security and exports, U.S. national security interests dictate that there are some goods which must not be sold in some markets. The willingness of some western European countries to help Libya construct a chemical weapons production complex, for example, does not justify the involvement of U.S. companies in similar ventures.

Nations which threaten the security interests of the United States should not be armed by America, nor should America help them arm themselves. America's government should be reducing the likelihood that the world's foremost proliferators are engaging in this activity with the assistance of the United States. The fight against proliferation must include self-discipline at our own borders.

There is no reason to believe the Clinton Administration intended dual-use decontrol to endanger America's national security. According to Brookings' Kenneth Flamm, "[n]o one involved in the ongoing [supercomputer export decontrol] policy reform effort – and I know, because I was part of it – had any intention of handing America's military adversaries greater access to more powerful computers."[89] However unintended the results, supercomputers are now in places they shouldn't be. As Dr. William Schneider said, the Clinton Administration has "…liberalized export controls on dual use technology, equipment, and services that has had the unintended consequence of facilitating the process of proliferating WMD and their means of delivery as well as advanced conventional weapons."[90]

The Clinton Administration would do well to heed the warning of John Fialka, *Wall Street Journal* reporter and author of *War By Other Means*, who said, "[n]ations that take their technological edge for granted have a great deal to lose."[91]

ENDNOTES

[1] Clinton-Gore Campaign publication, *Technology: The Engine of Growth*, September 18, 1992.

[2] Holman Jenkins Jr., "Love is Blind in Silicon Valley," *Wall Street Journal*, September 25, 1992.

[3] Clinton-Gore Campaign publication, "*Technology: The Engine of Growth*," September 18, 1992, p. 20.

[4] *Ibid*.

[5] Letter from President William J. Clinton to Edward McCracken, September 15, 1993. Silicon Graphics, based in California's Silicon Valley, manufactures high performance computers.

[6] Department of Defense, *High Performance Computing Modernization Plan*, March 1997, p. 1. Hereafter cited as HPCM Plan.

[7] *Ibid*.

[8] Richard Bernstein and Ross H. Munro, The Coming Conflict With China (New York, Alfred A. Knopf, 1997), p. 141.

[9] U.S. Congress, Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, hearing on *Proliferation and U.S. Export Controls*, June 11, 1997, p. 22. Hereafter cited as Hearing, *Proliferation and U.S. Export Controls*.

[10] Dr. Peter Leitner, prepared statement before the Joint Economic Committee, 105th Congress, 1st Session, June 17, 1997, p. 9.

[11] Seymour Goodman, Peter Wolcott, and Grey Burkhart, An Examiniation of High-Performance Computing Export Control Policy in the 1990s (IEEE Computer Society Press, Los Alamitos, California, 1996), p. 57. Hereafter cited as the Goodman Study. The Goodman Study is deficient in many areas, as detailed in a report prepared for the Committee on National Security of the House of Representatives, *An Assessment of the Impact of the Export of Advanced Computers and Computation Technology on the Proliferation of Conventional Weapons, Weapons of Mass Destruction, and Their Means of Delivery*, by Stephen Bryen, Willliam R. Graham, Phil Marcus, and William Schneider, Jr., July 15, 1997. However, the Goodman Study does have a chapter which clearly describes the uses of supercomputers.

[12] U.S. Department of Energy, *The Need for Supercomputers in Nuclear Weapons Design*, January 1986, p. 34.

[13] Goodman Study, p. 56.

[14] HPCM Plan, p. 19.

[15] Hearing, *Proliferation and U.S. Export Controls*, p. 47.

[16] *Ibid*., p. 41.

[17] *Ibid*.

[18] Dr. Peter Leitner, prepared statement before the Joint Economic Committee, 105th Congress, 1st Sess., June 17, 1997, p. 9.

[19] Kenneth Flamm, "Decontrolling the Uncontrollable", The Brookings Review, Winter 1996, p. 24.

[20] White House Press Release, "Statement By The President," October 6, 1995.

[21] Hearing, *Proliferation and U.S. Export Controls*, p. 17.

[22] Clinton-Gore Campaign publication, *Technology: The Engine of Growth*, September 18, 1992, p. 20.

[23] Owen Matthews, "Supercomputer Sale Under Investigation," *Moscow Times*, February 18, 1997.

[24] Hearing, *Proliferation and U.S. Export Controls*, pp. 18-19.

[25] *Ibid*., and John Fialka, "U.S. Investigates Silicon Graphic's Sale of computer to Russian Weapons Lab," *Wall Street Journal*, February 18, 1997.

[26] Bill Gertz, "Supercomputers From U.S. Sold to Russian Nuke Site," *Washington Times*, February 19, 1997, p. A3.

[27] "RFNC-VNIITF's Mission," www.ch70.chel.su/vniitf/mission.html. It took 3 seconds to find this page after putting "VNIITF" into the "Excite" World Wide Web search engine.

[28] Professor Gary Milhollin, prepared statement before the Committee on National Security of the U.S. House of Representatives, 105th Congress, 1st Sess., April 15, 1997, p. 2.

[29] Jeff Gerth, "China Buying U.S. Computers, Raising Arms Fears," *New York Times*, June 10, 1997, p. 1.

[30] Professor Gary Milhollin, prepared statement before the Committee on National Security of the U.S. House of Representatives, 105th Congress, 1st Sess., April 15, 1997, p. 5, citing "information published by the [Chinese] Academy [of Sciences]."

[31] HPCM Plan, pp. 17-19.

[32] Professor Gary Milhollin, prepared statement before the Committee on National Security of the U.S. House of Representatives, 105th Congress, 1st Sess., April 15, 1997, p. 5, citing "information published by Silicon Graphics."

[33] Jeff Gerth, "China Buying U.S. Computers, Raising Arms Fears," *New York Times*, June 10, 1997, p. 1.

[34] Hearing, *Proliferation and U.S. Export Controls*, p. 19.

[35] Director of Central Intelligence Report to Congress, *The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, July-December 1996*, June, 1997, Hereafter cited as DCI Report.

[36] *Ibid.*, p. 6.

[37] U.S. Congress, Congressional Record, 105th Congress, 1st Sess., p. S7099.

[38] Hearing, *Proliferation and U.S. Export Controls*, p. 17.

[39] *Ibid*., p. 18.

[40] *Ibid*.

[41] U.S. Congress, Congressional Record, 105th Congress, 1st Sess., p. S7100.

[42] Department of Commerce, Entity List, Supplement No. 4, Part 744, October 1, 1997.

[43] *Ibid*., p. 1.

[44] Public Law 105-85, sections 1211 through 1215.

[45] "Commerce Seeking Quick Implementation of New Computer Export Curbs," *Inside U.S. Trade*, December 5, 1997.

[46] "New Export Controls on Supercomputers," *The Risk Report*, Special Bulletin, November 21, 1997, p. 1.

[47] The President's policy amounts to what is virtually a license-free zone for Tier 1 countries. While these countries are only supposed to reexport American supercomputers subject to U.S. licensing policy, it is a fact that many European nations – France and Germany are noteworthy, but not the only, examples – take a more casual approach to dual-use export controls than does even the Clinton Administration. Of the five supercomputers in Russia's nuclear weapons complex, the one not provided by Silicon Graphics was an IBM machine transferred from a nation in western Europe.

[48] U.S. Congress, amendment #186 to the National Defense

Authorization Act For Fiscal Year 1998, H.R. 1119, 105th Congress, 1st Sess., 1997.

49 U.S. Congress, amendment #420 to the National Defense Authorization Act For Fiscal Year 1998, S. 936, 105th Congress, 1st Sess., 1997, as introduced on June 19, 1997, U.S. Congress, Congressional Record, 105th Congress, 1st Sess., p. S5991-96.

50 U.S. Congress, Congressional Record, 105th Congress, 1st Sess., p. S5992.

51 *Ibid*., p. S5993.

52 *Ibid*., p. S5995.

53 *Ibid*., p. S6023.

54 *Ibid*., p. S6900.

55 *Ibid*., p. S7053.

56 *Ibid*., p. S7099.

57 *Ibid*., p. 7101.

58 Lt. Gen. Robert L. Schweitzer (Ret.), prepared statement before the Joint Economic Committee, 105th Congress, 1st Sess., June 17, 1997, p. 1.

59 Hearing, *Proliferation and U.S. Export Controls*, p. 23.

60 U.S. Department of Commerce, report #IPE-9524 from the Office of the Inspector General, *Export Application Screening Process Could Benefit From Further Changes*, September 1997, p. 7. Hereafter cited as Commerce Department Inspector General Report.

61 William Reinsch, prepared statement before the Committee on National Security of the U.S. House of Representatives, 105th Congress, 1st Sess., November 13, 1997, p. 2.

62 Table prepared by the Department of Commerce/Bureau of Export Administration, sent to Senator Cochran on June 25, 1997, as amended by William Reinsch via letter to Senator Cochran on September 4, 1997.

63 Letter to Senator Thad Cochran from William Reinsch, December 11, 1997.

64 *Ibid*., and, conversation between Subcommittee staff and senior Bureau of Export Administration official, December 12, 1997.

65 Letter to Senator Thad Cochran from William Reinsch, Decermber 11, 1997.

66 William Reinsch, prepared statement before the Committee on National Security of the U.S. House of Representatives, 105th Congress, 1st Sess., November 13, 1997, p. 2.

67 Commerce Department Inspector General Report, p. 7.

68 *Ibid*., p. 24.

69 *Ibid.*, p. 22.

70 *Ibid*., p. v.

71 Public Law 105-85, Section 1213(a).

72 "IBM Says Cooperating in US Probe of Computer Sale to Russia," *Associated Press*, October 29, 1997.

73 DCI Report, p. 6.

74 White House Press Release, "Statement By The President" November 19, 1997.

75 U.S. Constitution.

76 William Reinsch, prepared statement before the Committee on National Security of the U.S. House of Representatives, 105th Congress, 1st Sess., November 13, 1997, p. 3.

77 Table prepared by the Department of Commerce/Bureau of Export Administration, sent to Senator Cochran on June, 25 1997, as amended by William Reinsch via letter to Senator Cochran on September 4, 1997.

78 William Reinsch, prepared statement before the Committee on National Security of the U.S. House of Representatives, 105th Congress, 1st Sess., November 13, 1997, p. 4.

79 White House Press Release, "Export Controls on Supercomputers," October 6, 1995, p. 1.

80 GAO testimony before the HNSC, Harold J. Johnson, April 15, 1997, p. 5 of prepared statement (GAO/T-NSIAD-97-128).

81 Hearing, *Proliferation and U.S. Export Controls* p. 16.

82 Flamm, "Decontrolling the Uncontrollable", p. 24.

83 "New chip boosts computer's power and storage," *Associated Press*, September 17, 1997.

84 Meeting with Subcommittee Staff and Aaron Cross, Director of Public Policy, IBM, June 24, 1997, and phone conversation with Subcommittee Staff and Intel official, December 5, 1997.

85 Executive Order 12938, "Proliferation of Weapons of Mass Destruction."

86 "Netanyahu: Iran Might Target U.S.," *Associated Press*, November 17, 1997.

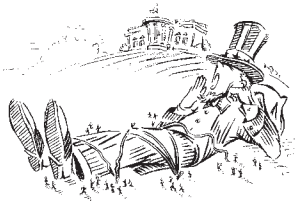
87 DCI Report, p. 5.

88 *Ibid.*

89 Flamm, "Decontrolling the Uncontrollable", p. 22.

90 Hearing, *Proliferation and U.S. Export Controls*, p. 48.

91 John Fialka, prepared statement before the Joint Economic Committee, 105th Congress, 1st Sess., June 17, 1997, p. 8.



Our case studies have observed proliferation that is reminiscent of Errol Flynn style intrigue, with border smuggling, disguises, and chases at sea amid the thrust and parry of traditional diplomacy. But in the twenty-first century proliferation will oftentime be invisible, for its perpetrators are likely to be masters of the new information technology. Those trying to defend against it will have to cope with rapid changes as they struggle to prevent nuclear, chemical, and biological blackmail, and the horror of war.

There is within the United States a vast amount of openly available information and hardware useful to anyone who wants to build a long-range ballistic missile. Because of this, it is difficult to predict how quickly other nations will obtain ballistic missile technology, components, or entire systems, and how soon our country will face a long-range ballistic missile threat.

The American Experience

The development of America's first intercontinental ballistic missile (ICBM), the Atlas, began in 1955; it was successfully flight tested in 1957 and declared operational in 1959.[1] General Bernard Schriever, who was the Atlas program manager and later commander of the Air Force Systems Command, described in Senate testimony three main technical challenges to ICBM building in the 1950's: attaining intercontinental range, accurate guidance, and system integration. All of these challenges are readily solvable today.

The Atlas program built on the success of the existing Thor intermediate-range ballistic missile. One of the fundamental challenges was to extend Thor's reach from 2,800 kilometers to intercontinental range.[2] According to General Schriever, extending a missile's range "...is among the easiest and most straightforward things to do. One need only add additional boosters – either on the top or on the sides of an existing missile."[3] That was the technique used to build Atlas, which added an upper stage to extend Thor's range to 8,300 kilometers.[4] This technique is standard practice today, with all of America's space launch vehicles and ICBM's using some form of stacked or strap-on boosters. While the Atlas is long retired, the Atlas II, a direct descendant of General Schriever's first ICBM, is today an Air Force medium-lift space-launch booster and still features a stacked booster configuration.[5]

The Atlas program's second challenge was accurate guidance over intercontinental distances. General Schriever described its initial requirement as an accuracy of 1,500 meters, but after the development of lightweight, high-yield nuclear weapons, this was relaxed to 3-5 miles.[6] Schriever noted this requirement was specific to the destruction of military targets with a high degree of confidence. "If the only requirement is to hold population centers at risk," General Schriever stated, "accuracy requirements can be even further relaxed."[7] In the 1950's, solutions to such problems had to be inventive, Schriever testified; today they are routine. To deliver weapons of mass destruction, "...guidance becomes a relatively straightforward problem to solve – made even easier through the commercial availability of global positioning system signals."[8] Furthermore, General Schriever said, "...commercially available inertial systems alone can do this job."[9] Today, inertial measurement systems of far greater accuracy than those of 1959 are widely used in commercial aerospace, and controls on their export have been imperfect. Moreover, machine tools which facilitate the manufacture of highly accurate guidance components are widely available.

General Schriever's final challenge, system integration, was serious "...due to the fact that virtually all of the components and subsystems were first-of-a-kind items."[10] Because the U.S. had never built an ICBM, the Atlas team had to pioneer many subsystem testing techniques that are taken for granted today. "Such testing is now well refined and procedures are systematic and well known. In addition, today components and many of the key subsystems are available for purchase on the open market – leaving little question as to their operability," General Schriever testified.[11] The Atlas team, he said, lacked even basic knowledge of crucial phenomena such as re-entry conditions. The lack of analytical modeling capability

required much integrated testing. "Both the physics and analytical capability are readily available" and much of the integrated testing of the Atlas program "could today be done using computer analysis," according to General Schriever.[12]

Of course, there are other important differences between the Atlas of the 1950's and today's potential rogue nation ICBM. Atlas, as the general pointed out, was part of an evolving and complex nuclear force structure to deter war and prevail should deterrence fail. Therefore, the weapon had strict requirements for readiness, maintainability, and reliability.[13] A rogue state might eventually desire such characteristics, but initially an ICBM in the hands of a rogue would have no such requirements. Its purpose would be served if it were believed capable of getting off the ground and to the target with its mass destruction weapon. Moreover, as General Schriever noted, his team used "slide rules and vacuum tube computers," while today desktop PC's have "capabilities orders of magnitude greater."[14] And it is important to note that today's ICBM builder has "...the certain knowledge that long range ballistic missiles can and have been built."[15]

Today's ICBM builder has "the certain knowledge that long range ballistic missiles can and have been built."

– Dr. William R. Graham
Former White House
Science Advisor

Availability of Information and Other Resources

Much of the knowledge necessary to build an ICBM is available to anyone who looks for it. In testimony before the Senate, Dr. William Graham, Science Advisor to Presidents Reagan and Bush and former Deputy Administrator of the National Aeronautics and Space Administration (NASA), noted that while ballistic missile technology was treated by governments as a secret field of research immediately after World War II, today "...the need to educate, train and maintain a large cadre of ballistic missile and space launch vehicle specialists, together with a relaxation of government restrictions on the dissemination of ballistic missile technology, hardware, software, and trained personnel, have made useful knowledge of the subject widely available."[16] Indeed, as General Schriever stated in his testimony, "[t]he mysteries we worked our way through 40 years ago are today taught as engineering problems in any good graduate school."[17] The solutions to those mysteries are readily at hand, and they are taught in American universities to an increasing number of foreign students.

Education

Typical engineering courses in American universities today include many that are directly relevant to building a ballistic missile. A sample from the course listing of a well-known private university include: Atmospheric Entry, Space Systems Engineering, Spacecraft Design, Design Of Composite Structures, Inertial And Radio Navigation, Global Positioning System, Space Mechanics, and Rocket Propulsion. The existence of such courses as a routine part of undergraduate and graduate study at American universities has transformed what was once arcane and highly specialized technical expertise into what is now part of the body of general scientific knowledge. This evolution from phenomenal to commonplace characterizes many technological advancements of the last half century, especially in computers and telecommunications.

Foreign Students in the United States

According to the National Science Foundation, most foreign students in the U.S. study science and engineering.[18] In 1991-1992, nearly half the 400,000 foreign students in U.S. colleges and universities studied these disciplines, twice the percentage for American students.[19] Foreign students are even more disproportionately enrolled in advanced degree programs. In 1993, non-Americans earned about 2.7% of bachelor's degrees, 12% of master's degrees, and 26% of doctorates, despite their 3% share of total advanced education enrollments.[20]

In 1977, foreign students earned 11% of all American master's degrees awarded in mathematics and computer science and 22% of those awarded in engineering.[21] By 1993, the numbers had risen to 35% and 33%, respectively.[22] At the doctoral level, foreign students earned

18% of computer science and math degrees and 29% of engineering degrees in 1977. In 1993, it was 44% and 51%, respectively.[23] Those figures are for students holding temporary visas. If non-citizens with permanent residence were included, doctoral figures would be 47% in math and computer science and 57% in engineering.[24]

The figures are even higher for some countries of origin. In 1981, China had no doctoral candidates in the U.S.; by 1991, there were 1,596.[25] Today, 83% of Chinese students are enrolled in science and engineering fields, and nearly two-thirds study at the graduate level.[26] Chinese students comprise approximately 10% of all foreign students studying in U.S., the highest percentage of any country.[27]

China is not the only proliferant state that sends students to obtain the technical expertise available in American universities. According to the Visa Office of the State Department's Immigration and Naturalization Service (INS), the following number of Category F (student and dependent) visas have been issued since 1984 for the countries indicated:

North Korea	98
Iran	16,854
Iraq	2,007
Libya	408
Syria	9,308
China	121,952[28]

The State Department tracks only numbers of visas, not the students themselves. Until recently, the U.S. government made no attempt to monitor activities of foreign students; what they study, who finances their education, and where they go afterward.[29] In response to questions about the World Trade Center bombing, the INS reported, "[a]t present, foreign students in the U.S. are not subject to continuing scrutiny, tracking, or monitoring when they depart, drop out, transfer, interrupt their education, violate [their visa] status, or otherwise violate the law."[30] Congress subsequently authorized a pilot program, begun in June of 1997, to determine the feasibility of collecting data on foreign students studying in the U.S., but it covers only about two percent of the foreign students estimated to be in the U.S.[31] The U.S. has issued student visas to nearly 10,000 residents of terrorist states since the Gulf War who have studied primarily in technical fields.[32] The following data show the percentage of each country's students in the United States who studied science and engineering during the 1995-96 academic year:

Iran	71.9%
Iraq	65.0%
Libya	47.5%
Sudan	53.9%
Syria	68.5%[33]

Publicly Available Information

Potential proliferators need not enroll in a doctoral program to acquire America's vast technical expertise because so much is available at their fingertips. As Senator Thad Cochran noted, "The Internet puts the vast technical resources of the U.S. – and those of other countries – at the disposal of anyone with a telephone line," and each day more resources are available on-line.[34]

Visitors to NASA's homepage on the World Wide Web are greeted thus by Administrator Goldin: "NASA is deeply committed to spreading the unique knowledge that flows from its aeronautics and space research…."[35] To organize that unique knowledge NASA has established the "Scientific and Technical Information (STI) Program," which promises "ready access to over 3 million aerospace and related citations. Powerful search capabilities offer access to both the latest and most important historical information about aerospace, aeronautics and related topics."[36] STI includes the Center for AeroSpace Information, or CASI. "The CASI Technical Reports Server (RECONselect) is a field searchable WAIS [Wide Area Information Server] database which contains NASA produced technical reports and aerospace-related open literature from 1970 through current…."[37] A NASA fact sheet describes CASI's functions as follows:

- Acquires STI that is essential to NASA in avoiding duplication of research and maintaining U.S. preeminence in aerospace
- Acquires, processes, archives, announces, and disseminates NASA and worldwide STI
- Maintains the STI Database of more than 3 million bibliographic records
- Offers a wide array of electronic services and products via the Internet
- Provides free registration to users
- Provides the NASA Access Help Desk to help you locate and obtain STI[38]

A CASI search on the term "ballistic missile" turned up the following citations, among many others:

- Extendible exit cone effects on ballistic missile stability, AIAA PAPER 80-1302, Jun 01, 1980
- Submarine launched ballistic missile - improved accuracy, AIAA PAPER 81-0935, May 01, 1981
- Ballistic missile design, part 1, Nov 19, 1970
- Spread of decoys from a ballistic missile, RAE-TR-64074, Dec 01, 1964
- Stability of spinning ICBM (intercontinental ballistic missile) in first stage boost phase, AD-A164019, Dec 01, 1985
- Ballistic missile aiming systems, AD-704219, Jan 16, 1970
- Solid fuel ballistic missile design, JPRS-59060, May 18, 1973
- Advanced high energy missile control systems, AD-750306, Jan 01, 1972
- The use of the Global Positioning System for ballistic missile tracking, Jan 01, 1987
- Problems of controlling the flight of a ballistic missile, Dec 12, 1975
- A pneumatic actuation system for a large ballistic missile, Jan 01, 1978
- Solid propellant ballistic missiles, AD-766022, Jul 25, 1973
- Estimation of ICBM (intercontinental ballistic missile) performance parameters, Dec 01, 1986
- Ballistic missile sizing and optimizing, AIAA PAPER 78-1019, Jul 01, 1978
- Minimum ballistic factor missile shapes for variable skin-friction coefficient, Oct 01, 1973
- Advances in propellant propulsion technology for intermediate range ballistic missile, Mar 01, 1980
- Minimum ballistic factor missile shapes, Nov 01, 1971
- Gravitational perturbations of ballistic missile trajectories v. time of flight over a spheroidal earth, RAE-TN-WE-36, Aug 01, 1963
- A preliminary assessment of the effect of air drag on ballistic missile trajectories, RAE-TN-WE-8, Jan 01, 1966
- Optimal mid-course modifications of ballistic missile trajectories, AD-A019333, Dec 01, 1975
- Ballistic design methods for solid-fuel missiles, JPRS-59565, Jul 20, 1973
- Motion of a ballistic missile angularly misaligned with the flight path upon entering the atmosphere and its effect upon aerodynamic heating, aerodynamic loads, and miss distance NACA-TN-4048, Oct 01, 1957
- Missile design - Some basics, Feb 01, 1984

The program displays an abstract and locates the document. Most can be ordered from NASA.[28] While many are, of course, decades old, so is the ICBM. Rogues don't need the most modern ICBM's. They would find the Atlas of 40 years ago more than sufficient for their purposes. While much material in a database this size would be irrelevant to an ICBM builder, useful items can be located easily.

NASA is not the only on-line source. The U.S. Patent Office has a searchable database of patents dating from 1976. A search on the term "missile and guidance" produced:

missile: 4422 occurrences in 1661 patents.
guidance: 5083 occurrences in 3196 patents.
(missile AND guidance): 257 patents.
Search Time: 1.85 seconds. 257 results

Among the 257 results were the following:

Patent Number and Title

5,554,994	*Self-surveying relative GPS (global positioning system) weapon guidance system*
5,544,843	*Ballistic missile remote targeting system and method*
5,457,471	*Adaptively ablatable radome*
5,451,014	*Self-initializing internal guidance system and method for a missile*
5,435,503	*Real time missile guidance system*
5,397,079	*Process for the autonomous positional control of guided missiles*
5,379,966	*Weapon guidance system (AER-716B)*

The system provides a patent abstract, information on the number of associated drawings, links to related patents and to other on-line resources, and ordering information. Patent offices of numerous other countries are also available on-line. Publicly available information virtually built the Soviet space shuttle. When the "Buran" (Russian for "snowstorm") was unveiled in 1988, observers were stunned at its resemblance to its American counterpart.[40] The similarity was not accidental. In what was called "one of the first cases of Internet espionage," the

KGB systematically collected public information and mined open commercial and government databases for information on the U.S. shuttle program.[41] According to a CIA report,

> From the mid-1970's through the early 1980's, NASA documents and NASA-funded contractor studies provided the Soviets with their most important source of unclassified material in the aerospace area. Soviet interests in NASA activities focused on virtually all aspects of the space shuttle. Documents acquired dealt with airframe designs (including the computer programs on design analysis), materials, flight computer systems, and propulsion systems. This information allowed Soviet military industries to save years of scientific research and testing time as well as millions of rubles as they developed their own very similar space shuttle vehicle.[42]

Other intelligence officials said the Russians saved "billions" by on-line spying.[43]

Soviet-exploited databases include those maintained by the DoD's Defense Technical Information Center (DTIC) and the Commerce Department's National Technical Information Service (NTIS), both of which provide technical reports purchasable from the Government Printing Office (GPO).[44] According to intelligence officials, until they were cut off by the Reagan administration, the Soviets simply bought DTIC and NTIS documents from the GPO office in Washington.[45] This overt information gathering took place in the earliest days of the Internet and the personal computer with tools that were relatively primitive compared to those available today.

The Internet is only the beginning. Modern computers can put entire libraries on a desktop. Commercial databases such as *The Aerospace Database* are available on CD-ROM. As described by its publisher,

> The Aerospace Database… contains abstracts of reports issued by NASA, other U.S. government agencies, international institutions, universities, and private firms.
>
> Dating back to 1962, the online Aerospace Database contains more than 2 million references that you can search and retrieve easily and cost effectively. And you can quickly access them on a modem-equipped computer terminal. Once you've located the reference you want, you can obtain a photocopy or microfiche of the full text…
>
> The CD-ROM version of our database is the cost-effective solution for frequent database users. An especially good bargain for international subscribers, it lets you avoid the telecommunications requirements and costly connection charges of online service…
>
> Updated monthly, the Aerospace Database online is perfect for monitoring aerospace markets in other countries, gaining access to the work of international aerospace leaders, staying abreast of new products and trends, keeping up with emerging technologies. In just seconds the Aerospace Database lets you search more than 30 years of accumulated knowledge in aerospace and related sciences. You'll find in-depth coverage of aeronautics, astronautics, space sciences, chemistry and materials, geosciences, life sciences, mathematics, and computer sciences.
>
> You'll have the convenience of using the CD-ROM at your desktop. No costly connection charges. Just an easy to use CD-ROM for your own personal use… [46]

Also available commercially are cheap but sophisticated mathematics, design, engineering and manufacturing software programs which give potential proliferators needed tools to design and build ballistic missiles. NASA even maintains a World Wide Web site devoted to distributing such software. COSMIC, "NASA's Partner for Software Technology Transfer,"[47] is an internet service whose "...role as part of the NASA Technology Transfer Network is to ensure that industry, other government agencies, and academic institutions will have access to the advanced computer software technology which is produced for NASA projects."[48] Items in the COSMIC catalog, including high-fidelity missile modeling software, may be ordered via phone, fax, or e-mail. Numerous universities and laboratories offer technical software useful for ballistic missiles, including programs for three-dimensional fluid dynamics, finite element analysis, aero-

dynamic design, and combustion modeling, directly downloadable without restriction.[49]

Expertise

Expertise too is for sale. With steep reductions in the ballistic missile forces of Belarus, Kazakstan, Ukraine, and Russia, there is a large, skilled technical force of scientists and engineers who are available to those who may need their assistance. The transition from a command economy toward a market-oriented one has left many of these workers unemployed and impoverished. So dire has the situation become that in 1995, the director of the noted Russian nuclear weapons laboratory, Arzamas-16, committed suicide when he was unable to pay his scientists, engineers, and technicians for months on end.[50] Press reports in August of 1997 described Russian scientists, displaced from Cold War-era jobs, who were working in Iran on medium-range missiles capable of striking Central Europe.[51] Neither the Russian government nor U.S. intelligence agencies have conclusive data on how many people like these are employed in other countries.[52]

Hardware and Materials

Given Russia's economic problems, impoverished military, and pervasive lawlessness, the security of Russian military hardware is problematic. Some troubling evidence was found in 1995 on the bottom of the Tigris River in Iraq, where United Nations inspectors discovered precision gyroscopes that had been removed from Russian long-range missiles.[53] Similar equipment was intercepted in Jordan enroute to Iraq.[54] Russian officials denied involvement, but could not explain how missile equipment disassembled under the START Treaty got to Iraq, although a *Washington Post* article said the devices were protected in storage only by "a lock, and one person."[55]

Lax Russian security is not the only source of hardware. In 1996, a *U.S. News and World Report/60 Minutes* investigation reported the disarray in the U.S. Defense Department's disposal of surplus military hardware, run by the Defense Reutilization and Marketing Service (DRMS). Surplus materials are coded for destruction or "demilitarization" (rendering the equipment militarily useless) before sale from warehouses (called "DRMO's") and marketed on the internet. According to Defense Department officials, however, most equipment is improperly coded, and much dangerous hardware, including attack helicopters, missile guidance equipment, and computers storing top secret nuclear weapons data, has been sold. The nuclear weapons information was contained in a computer purchased by China, DRMS's "biggest customer,"[56] and was concealed in scrap metal bound for Shanghai when intercepted by the U.S. Customs Service.[57] In the fall of 1997, a Minuteman ICBM test console was listed for sale in the DRMS catalog, coded as not requiring demilitarization. After Senate staff inquiries, the equipment was removed from the on-line catalog but its final disposition could not be determined. A diligent caste of middlemen buy from DRMS and resell indiscriminately. At one California surplus store, a shopper paid $100 cash for each of two working rocket engines – engines used to steer General Schriever's Atlas ICBM.[58]

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The end of the Cold War has complicated surplus equipment management. DRMO workers and managers describe themselves as "...overloaded with equipment from the massive military drawdown," worth more than $20 billion annually in recent years.[59] Much of it is new and increasingly sophisticated. A Defense Department investigator told *60 Minutes*, "[t]he types of property that these DRMO's are receiving has changed. It's no longer the obsolete materials… Now it's state-of-the-art, high-tech, sensitive military equipment that they're receiving."[60] However, as Senator Cochran observed, "[t]he fact is that

the U.S. can be threatened by technology other than the most advanced."[61] The Atlas ICBM of 40 years ago would still be a formidable weapon for today's rogue state.

Sophisticated hardware is increasingly obtainable commercially. While the Global Positioning System (GPS) began as a U.S. military navigation tool, it is commonly used today by civilians. GPS receivers accurate to within 50 feet are available by mail for under $100.[62] An innovative team of junior Air Force engineers built a guidance system for a cruise missile using commercially procured GPS receivers and microprocessors. They bought numerous components once available only to military organizations, including radar absorbing material, inertial measurement units, small rocket motors, heat shield materials, sophisticated ceramics, and more, all on the open market.[63]

One item with implications for proliferation is the ballistic missile's fraternal twin, the space launch vehicle (SLV). Technologically, there is "no real difference"[64] between the two; all current U.S. expendable space launch vehicles began life as ballistic missiles.[65] The reverse is the case with the Indian Agni missile, which is based on an SLV.[66] According to Dr. William Graham, "[i]f you take space launch vehicle technology and add to it the reentry vehicle, you have an ICBM."[67] How to add the reentry vehicle is well understood, documented and disseminated, especially if there is no requirement for high accuracy, and expert assistance is plentiful and available.

The increased demand for satellites leads to a concomitant one for new space launch capabilities. The telecommunications explosion, for example, has increased demand for personal communication services best met by space-based satellite systems. Iridium is a commercial venture placing in orbit 66 satellites to form a global, wireless communications network which "...will enable subscribers to communicate using handheld telephones and pagers virtually anywhere in the world," beginning in 1998.[68] Teledesic, a consortium led by Microsoft Corporation chairman Bill Gates, has still more ambitious plans to create a constellation of several hundred satellites for worldwide wireless internet and telecommunications access.[69] Small dish antennae, high-quality digital signals, and inexpensive receiving equipment have created high demand for Direct Broadcast Satellite television of which nearly six million systems have been installed in the U.S. in just over three years.[70] Even car manufacturers offer GPS-based navigation systems. All these forces create high space launch demand, and as Dr. Seth Carus notes, "[n]ew space launch vehicles under development generally require fewer people to operate, often are designed to be fired from mobile launchers, and are designed to be operated with minimal preparation…. Unfortunately, these same characteristics are useful for ballistic missiles as well as space launch vehicles."[71] This increased demand can result only in greater diffusion of space launch knowledge. As commercial space launch becomes more commonplace, so will its technology and hardware.

Anticipating the Threat

Easy access to technology is not the only troublesome aspect of tomorrow's WMD and delivery systems threat. History demonstrates that it is difficult for intelligence agencies to obtain an accurate understanding of when such threats will materialize.

First Soviet Atomic Explosion

On July 1, 1949, the CIA issued its top secret annual report on the Soviet atomic energy project which concluded, "their first atomic bomb cannot be completed before mid-1951" and declared mid-1953 as the "most probable date."[72] Eight weeks later the Soviets exploded their first nuclear device.[73] Misjudgments about ballistic missiles also go back a half-century and continue today.

British Estimates Regarding the German V-2 Ballistic Missile

The V-2 was the first successful long-range missile, the prototype of all modern ballistic missiles, and the first guided missile used in war. Between September 1944 and March 1945, over 2,500 V-2's killed several thousand people. More ballistic missiles were launched during these months than in all subsequent conflicts combined, including the Iran-Iraq "War of the Cities" and the Persian Gulf War.[74] The V-2 fathered missile proliferation as well. After World War II, the U.S., the Soviet Union, France, and Britain competed for captured V-2 technology, research, and personnel.

The Treaty of Versailles, while banning German heavy artillery, placed no restrictions on missiles. The German Ordnance Office adjusted, substituting ballistic missiles

for the illegal artillery (a cautionary tale for arms controllers). Ballistic missiles were also intended to deliver chemical agents against enemy troops.

Military specifications for the V-2 were set in 1936. Work began at Peenemunde, on the Baltic, in 1937. Testing commenced in mid-1942, with the first completely successful launch in October of that year. Production started roughly a year later.

Late in 1939, an anonymous source gave British intelligence a report mentioning the missile-related activity at Peenemünde, although the lead was not pursued for three years. In the winter of 1942-43, additional intelligence, including the secret recording of a conversation between two captured generals, again alerted the British to the German ballistic missile program. This time, a major collection and analysis effort acquired much photographic, human, and signals intelligence on the German work. But only in August 1944, weeks before the V-2 began to rain on London, did British intelligence arrive at a reasonable understanding of the V-2's propellant, missile and warhead size, and firing method.[75]

On September 7, 1944, after three months of buzz bomb strikes, the British Government announced the end of V-1 attacks on London. Officials felt safe enough about V-2's to keep even their invention secret from war-weary Britons. After all, no launch sites had been detected, and in any event the Allied advance would surely push them south, out of range.

Once again, the experts were wrong. On September 8, the first of over 500 V-2s hit London.

East European SS-23 Missiles

In March of 1990, after the fall of East Germany, its successor government revealed it possessed two dozen SS-23 ballistic missiles and their associated transporters, launchers, and support equipment.[76] As these 500 kilometer range missiles had been banned by the Intermediate-Range Nuclear Forces (INF) Treaty of 1987 between the U.S. and the Soviet Union, arms controllers were surprised by the discovery. Prior to the INF agreement, the USSR had transferred SS-23's not only to East Germany, but also to Bulgaria and Czechoslovakia. Afterwards they argued this had not violated the INF treaty, saying it applied to Soviet and American missiles, not those of other "sovereign" nations.[77]

Western intelligence agencies were said to be unaware of the missile transfers, even though, as Dr. Seth Carus points out, these missiles were a "priority target" for NATO intelligence organizations and "...there were few areas of the world subject to more intensive intelligence surveillance than Eastern Europe in the 1980's."[78] Yet the redeployment of these nuclear capable missiles might never have been discovered in the absence of the economic and political collapse.

Saudi Purchase of CSS-2 Missiles from China

In March of 1988, the U.S. announced Saudi Arabia had obtained several dozen CSS-2 (DF-3) Dong Feng ("East Wind") missiles from the People's Republic of China. The announcement came more than a year after the Saudis began their effort to obtain the missiles.[79]

Iran's aggressive initiatives in the Iran-Iraq war alarmed Saudi leaders: a quasi-successful ground offensive, the "Tanker War" against Saudi shipping in the Persian Gulf, and missile attacks on Iraq.[80] According to Saudi General Khaled Bin Sultan,

> It was against this background of Iranian violence and persistent belligerence that, I assume, King Fahd decided that we needed a weapon to improve the morale of our armed services and our people; a deterrent weapon not intended to be used, except as a last resort when it should be able to demoralize the enemy by delivering a painful and decisive blow; a weapon which, once launched, could not be jammed or intercepted; a weapon which would make an enemy think twice before attacking us. The challenge was to find a country able to supply such a weapon at speed and without constraining conditions.[81]

When the Saudis were unable to purchase American short-range Lance missiles and F-15E strike fighters, they looked elsewhere for missiles.[82] In 1986, the Saudis began secret negotiations with China to buy CSS-2's, a missile whose range has been estimated at up to 3,000 kilometers, placing Israel and Iran within reach. The Saudis

maintained operational security using small teams of hand-picked officers, hidden facilities, cover stories, decoys, and tight security practices.[83] Between 50 and 60 CSS-2's were purchased;[84] 25 missiles arrived in the fall of 1987, and 25 more in the spring of 1988.[85]

In March 1988, the Saudis claimed an undisclosed number of CSS-2's.[86] While they assured the U.S. the missiles would be armed only with conventional warheads, observers feared an escalation to nuclear warheads. Partly to ameliorate these concerns, Saudi Arabia has since joined the Nuclear Nonproliferation Treaty (NPT).

U.S. intelligence had no apparent awareness of the CSS-2 purchase before the fall of 1987.[87] The Saudi acquisition became more obvious in January of 1988, when trucks carrying imported Chinese missiles ostensibly destined for Iraq were observed traveling south, rather than north, from Saudi ports.[88]

The late discovery of the CSS-2 purchase is widely regarded as a U.S. intelligence failure. William Safire wrote, "the Chinese-Saudi missile deal stunned Washington, which mistakenly thought that neither Beijing nor Riyadh would alter the balance of power in the Middle East without checking with the U.S."[89] Even the Saudi director of the project was surprised this secret was kept so long. Saudi Prince Sultan writes, "it was rumored that five CIA people had been fired for the intelligence failure, but this may have been bluff."[90]

Iraqi Extended-Range Scud Missiles

The Iraqi regime faced a problem during its war with Iran in 1986: Iranian Scud-B missiles regularly bombarded Baghdad, while Tehran, about 500 kilometers from the Iraqi border, was beyond the range of Iraq's own Scud-B's. Saddam Hussein therefore undertook a crash program to extend the range of his Scuds.

The Iraqis' ability to double their Scud-B range was apparently unanticipated by the U.S. According to the 1993 Air Force-sponsored Gulf War Air Power Survey, *"[b]y all indications, Western intelligence agencies were unaware of this program until scores of Al-Husseins began hitting Iranian cities." While Iraq publicly announced the existence (and a test) of the Al-Hussein as early as August of 1987, this "was discounted as bluster by most foreign observers."*

He used two expedients: the payload (warhead) size was reduced, and the missile's fuselage and fuel tanks were lengthened for increased volume.[91] The modifications gave the new missile, the Al-Hussein, twice the 300 kilometer range of the Scud-B, sufficient to reach Teheran from Iraq. The modifications were apparently made by cannibalizing Scud-B's, with two Al-Husseins built from three Scud-B's. East Germany, Egypt, and North Korea may have assisted in the modification.[92] West Germans may also have helped construct and operate the production facilities, and build the missile itself.[93] Less than two years after Iranian Scuds hit Baghdad, the Iraqis were ready to respond with their improved-range Al-Hussein.

On February 29, 1988, Baghdad announced Iraq would continue to attack cities in Iran until the Iranians agreed not to attack Iraqi cities.[94] From February to April, about 190 Al-Husseins were fired at six Iranian cities; 135 hit Tehran. The missiles, too inaccurate to use against military targets, killed 2000 and wounded 4000, amid significant other damage. Some 25 to 60 percent of Tehran's population of 10 million fled in response to the Iraqi barrage.[95] The Al-Hussein strikes persuaded Iran to cease firing their Scud-B's at Baghdad. The "War of the Cities" ended on April 20, 1988. The Al-Hussein had achieved Saddam's objective.[96]

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apparently unanticipated by the U.S. According to the 1993 Air Force-sponsored *Gulf War Air Power Survey*, "[b]y all indications, Western intelligence agencies were unaware of this program until scores of Al-Husseins began hitting Iranian cities."[97] While Iraq publicly announced the existence (and a test) of the Al-Hussein as early as August of 1987, this "was discounted as bluster by most foreign observers."[98] Testimony by a former Director of the National Security Agency indicates the intelligence community had not been tasked by policymakers to determine whether Iraq was extending the range of its existing missile force.[99]

The Al-Hussein, and perhaps other upgraded variants of the Scud-B like the 800 kilometer Al-Abbas, were later used against Israel, Saudi Arabia, and U.S. forces in the Gulf War. In November of 1997 Defense Secretary Cohen said Saddam had been working on a 3,000 kilometer range ballistic missile which would have reached most of western Europe and "...was trying to extend the range even further and possibly reach parts of the U.S."[100]

Iraqi Launch of the Al-Abid Space Launch Vehicle

On December 7, 1989, Iraq announced it had two days earlier launched a rocket capable of carrying satellites into space. The 80-foot, 3-stage rocket, called Al-Abid ("the Worshipper"), weighed 48 tons and employed Scud technology. The first stage consisted of four or five Scud or Al-Hussein missiles strapped together. The second was two Scud/Al-Hussein missiles, and the third was either a single Scud, a modified Soviet surface-to-air missile, or possibly a small rocket of Brazilian design.[101] In the 1989 test, the first stage reached an altitude of about 12 kilometers, but the other two stages either failed to separate or may not have been activated.[102] Baghdad television broadcast the launch, showing the countdown and liftoff and tracking the rocket as it rose.[103]

Iraq claimed this missile could serve either as a satellite launch vehicle or as a 2,000 kilometer range ballistic missile.[104] The planned ballistic-missile variant of the Al-Abid was probably the Tammuz I, whose existence was announced by Baghdad on December 14, 1989.[105] Despite Iraqi claims to the contrary, the Tammuz I does not seem to have been flight tested. This missile, with a 750 kilogram (1650 lb.) payload, appears to have been in the research and development stage during the Gulf War.[106]

U.S. and other intelligence services evidently were surprised again, not only by the Al-Abid test launch, but by the very existence of the system. Defense analysts W. Seth Carus and Juan Bermudez, citing contemporary stories in the *New York Times*,[107] wrote:

> Western intelligence officials appear to have known nothing about the *Al-Abid*. Even when Iraq publicly announced the test, two days after the launch, U.S. officials were unaware of the existence of the *Al-Abid* or that it had been fired. Indeed, many U.S. officials were skeptical of the reports. As the U.S. scrambled to find out what had happened, a number of reporting errors were made. The U.S. Department of Defense claimed that the third stage of the booster went into a low earth orbit for several revolutions. Although this claim was incorrect, it clearly demonstrates the confused response by officials in the United States to the Iraqi launch.[108]

According to then-Senator Cohen, "[t]hey [the Iraqis] surprised many, including most, I would suggest, within the intelligence community that they were able to achieve what they did. They came close to putting a payload in orbit. Now that came as a surprise."[109]

Secretary Cohen could have made that point about each foregoing example. Those failures in anticipation do more to expose the nature of this difficult problem than to condemn the U.S. Intelligence Community. Predictions of cultural, political, or economic change are routinely inaccurate. Predictions of technical change are even less reliable, particularly when combined with deception. For diverse reasons – successful deception, uncommon ingenuity, deficiency of intelligence, or simple failure – technological surprise has always been a fact of life, one likely to become more commonplace in the information age.

Conclusion

The 1995 National Intelligence Estimate

In 1995, the Director of Central Intelligence (DCI) issued a National Intelligence Estimate (NIE) on "Emerging Missile Threats to North America During the Next 15 Years" which concluded, "[n]o country, other than the major declared nuclear powers, will develop or otherwise

acquire a ballistic missile in the next 15 years that could threaten the contiguous 48 states or Canada."[110] Although the Gates Commission, headed by former Director of Central Intelligence Robert Gates, found that the NIE made "...a strong case that for sound technical reasons, the United States is unlikely to face an indigenously developed and tested intercontinental ballistic missile threat from the Third World before 2010," others were skeptical because of the inherent difficulty in prediction, because the U.S. Intelligence Community has missed innovations in the past, and because of the assistance countries like Russia and China are providing to rogue nations, particularly Iran, thus making the qualifier "indigenously" of indeterminate value.

The 1995 NIE was criticized on numerous methodological grounds by the General Accounting Office (GAO): For wording its main conclusion with unwarranted certainty, for failing to quantify the level of certainty for "…nearly all of its key judgments," for failing to identify its assumptions, and for failing to develop less likely "alternative futures."[111] The GAO did not examine the NIE substantively. Had it done so, it would have found more shortcomings.

The NIE relegated foreign assistance to rogue state ICBM programs to the category of "a wild card" which "...can hinder our ability to predict," but did not conclude or even estimate how much this "wild card" would shorten a rogue's ICBM development or acquisition time.[112] The NIE did not quantify in how much less time than "the next 15 years" a rogue could develop an ICBM with, for example, guidance technology from abroad. With more and better tools becoming increasingly accessible, outside assistance means "indigenous" development grows easier every day. As former Under Secretary of State William Schneider said in Senate testimony, the difficulty "...facing potential proliferators has evolved from a problem of basic scientific design to one of industrial processes."[113]

Predictions of cultural, political, or economic change are routinely inaccurate. Predictions of technical change are even less reliable, particularly when combined with deception. For diverse reasons – successful deception, uncommon ingenuity, deficiency of intelligence, or simple failure – technological surprise has always been a fact of life, one likely to become more commonplace in the information age.

The MTCR: Inadequate to the Task

The Missile Technology Control Regime (MTCR) is the Administration's primary tool for impeding the spread of ballistic missiles and weighed heavily in the NIE's conclusion that the 48 contiguous states would not face a ballistic missile threat in the next 15 years. While some analysts say it has played "...an important role in slowing the spread of ballistic missile technology," there are serious weaknesses in this regime.[114] First, it is not a treaty but a voluntary arrangement, which diminishes its legal efficacy.[115] While U.S. domestic law requires sanctions on persons or companies who violate the MTCR, the regime itself has no formal enforcement mechanisms.[116] Membership in this suppliers' group has grown from the original G-7 members in 1987 to 29 nations today, but there are important absentees, including North Korea and China. China, while pledging to adhere to MTCR guidelines, has not always done so, and although Russia is a member, its missile commerce with Iran raises serious questions about its respect for MTCR provisions.

The increasingly popular space launch vehicle challenges the MTCR's ability to control proliferation. Escalating demand for space-based telecommunications has created a corresponding demand for launch capability, and new consortia plan to launch hundreds of small satellites in the next few years. As the Arms Control and Disarmament Agency acknowledges, "...the technology used in an SLV is virtually identical to that used in a ballistic missile."[117] The MTCR explicitly considers "missiles" to include SLV's, but is "...not designed to impede national space programs."[118] Senator Carl Levin noted this inherent tension in a Senate hearing, observing that retarding proliferation by restricting SLV's "increases the chance people aren't going to join the MTCR because every country has a right to engage in space launches."[119] According to Seth

Carus, another important weakness arises from the Clinton Administration's interpretation of MTCR requirements:

> The text of the MTCR requires that SLV's be treated as restrictively as ballistic missiles. However, the current administration, while requiring new MTCR members that are not nuclear weapon states to eliminate MTCR-proscribed ballistic missiles, allows such new states to continue SLV programs and to receive assistance on those programs from other MTCR members.[120]

As demand for launch capacity increases, the SLV problem will worsen.

The MTCR, then, offers hope for impeding missile proliferation. But it is less an obstacle than originally hoped.

Intelligence Analysis

Another limiting factor in the Intelligence Community's predictions of technological innovation by rogue states is the tendency to assume that these states employ American-style testing in their development programs. The NIE reportedly states, "[d]evelopmental flight testing would normally provide a minimum of five years warning before deployment."[121] This is true of U.S. missiles, with their stringent requirements for accuracy, reliability, maintainability, and safety, but not for rogue states. A North Korean defector, Colonel Choi Ju-hwal, stated, "unlike U.S. missiles… North Korean missiles are not designed for such surgical precision. What they are targeting is a general region rather than specific facilities…. Therefore, the precision of the missiles is not a… matter of great importance…. So for that reason, they do not need multiple testings. One testing would be enough."[122] The No-Dong's history confirms that. Despite having only a single flight test, its deployment apparently has begun.[123]

Similarly, claims that rogues would not use ICBM's for fear of overwhelming U.S. retaliation suggest that analysts are assuming rogue states are driven by the same logic and strategic considerations as U.S. policymakers. An ICBM need not be used to be useful; the threat of a launch could be enough to constrain the U.S. in a crisis. In a confrontation, it would affect the calculus of U.S. leaders. One need not postulate an "irrational" rogue, but only understand that he might calculate his moves differently. What is viewed as a "cost" in Washington may appear to be otherwise in Tehran, Pyongyang, or Baghdad, among other places.

Dr. Graham has suggested a technique to mitigate this problem which he calls "intelligence anticipation." As he describes it, "[r]ight now, intelligence only tells us about what people see, and you are not going to see anything that is going to lead to substantial consequences ten years from now. So we should be… trying to analyze how countries with various stated intentions could act if they wished" to carry out those intentions.[124]

As part of this idea, Graham has also suggested "try intelligence" or "TRYINT:"

> [R]ather than just watching to see if some country does something, if we think it is possible for a developing world country to do something, let's get a group together with the resources and education and access of that third world country and let them try to do it and see what they come up with. That has actually been done a few times, not, as far as I know, by the intelligence community, but by other organizations in the government and the results have been startling and I believe profound.[125]

The Air Force is conducting at least two such programs, which examine missile threats to the U.S. The results are indeed startling and illustrate not just the value of "TRYINT" but the degree to which public information and materials can support missile programs (see box on opposite page).

The Importance of Will

Development of an ICBM is no trivial undertaking for anyone. If it were, missile threats to the U.S. would be far more numerous and long-established. But the steady march of technology, and the trend toward the normalization and increased civilian use of space, has transformed the once exotic technology of ballistic missiles into the commonplace. Corresponding improvements in information technology ensure this technology is spread widely and rapidly.

These developments are not to be lamented. The growing use of space has brought incalculable benefits to mankind. Information technology advances are exhilarating and essential to societies which value the free exchange of information and ideas. The widespread dissemination of knowledge will inevitably include information relevant to military capabilities, and we should understand, even expect, that some will put it to dangerous use. Such is the price of freedom.

The solution, then, is not to try to restrict the free flow of information and technology, though of course there is a place for controlling militarily specific and dual-use exports and classifying certain information. Rather, the U.S. must recognize the potential uses of such information, and prepare to deal with its consequences.

When asked to explain how he built America's first ICBM so quickly, General Schriever singled out one factor: "determination." He said the program succeeded because the U.S. was determined it would. Given the rapidly progressing Soviet missile program, Atlas had been designated "a matter of the highest national priority" and the will to succeed was central in overcoming technical obstacles the project encountered. "Experience has taught me that necessity is the mother of invention," Schriever testified.[127]

Long range missiles can deliver any weapon of mass destruction available and consequently are sought by many countries with interests inimical to those of the U.S. Since the first American ICBM's flew forty years ago, their existence has become commonplace

"TRYINT" IN ACTION

The CHOP and HTD Programs

- The Countermeasures Hands-On Program (CHOP) was initiated in 1993 to evaluate possible countermeasures to Ballistic Missile Defense Organization systems. CHOP tasks small teams of educated but inexperienced junior engineers to build countermeasures to U.S. theater missile defense programs, using only open source literature and materials available on the open market. The teams simulate capabilities available to potential rogue states seeking to defeat U.S. missile defense systems.
- A similar program, the Hands-On Threat Demonstration (HTD), is determining whether a comparable team could build a cruise missile exploiting Global Positioning System signals.
- These efforts are refereed by the intelligence agencies to ensure that all information and materials are available to potential rogue states.
- Both programs have been very successful. CHOP has successfully tested numerous projects that have provided valuable feedback to TMD designs, and the HTD program has built an unmanned aerial vehicle it will flight test in early 1998.

Examples of Sources Exploited by the Programs

- All design information is from open sources, including textbooks, journals, magazine articles, and public databases.
- In addition to databases of technical documents, the Internet has linked the teams to far-flung expertise, as when an Australian professor told a team via e-mail how to solve a complex equation needed to overcome one vexing technical problem.
- Teams find most components readily available, including radar absorbing material, tungsten, inertial measurement units, small rocket motors, heat shield materials, sophisticated ceramics, and a multitude of other critical components and materials.
- Without offering government credentials, HTD members obtained the master structural tooling for an unmanned aerial vehicle (UAV) from an aerospace company, no questions asked. The team made a working replica, including an allowance for ordnance, "in their garage."[126] The vehicle is scheduled for flight testing in early 1998.
- HTD designed and built a guidance system for their UAV using commercially available microprocessors and GPS.

and their technology is everywhere, from college textbooks to World Wide Web sites to the local electronics store. Export controls and arms control may slow but cannot stop the spread of missile technology, and growing demand for dual-use platforms such as space launch vehicles threatens to make such strategies increasingly ineffectual.

The question is not whether, but when a rogue state will summon the will to threaten the U.S. with an ICBM. America's track record of predicting such events suggests that this threat may appear sooner than expected. When the inevitable threat appears, the question will then be, are retaliatory threats alone enough to protect America and American interests?

ENDNOTES

[1] Telephone interview with Office of the STRATCOM Historian, November 18, 1997.

[2] *Ibid*.

[3] U.S. Congress, Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, hearing on September 22, 1997, *Missile Proliferation in the Information Age*, 105th Cong., Sess. 1, 1997, p. 31. Hereafter cited as Hearing, *Missile Proliferation in the Information Age*.

[4] *Ibid.*

[5] Space and Missile Systems Center, Fact Sheet: Atlas IIA Launch Vehicle Program, http://www.laafb.af.mil/SMC/PA/Fact_Sheets/atl2_fs.html, November 24, 1997.

[6] Hearing, *Missile Proliferation in the Information Age*, p. 32.

[7] *Ibid*. This argument was echoed by two North Korean defectors who testified at another hearing of the subcommittee.

[8] *Ibid.*

[9] *Ibid.*

[10] *Ibid.*

[11] *Ibid.*

[12] *Ibid.*

[13] *Ibid*.

[14] *Ibid.*

[15] Hearing, *Missile Proliferation in the Information Age*, p. 18.

[16] *Ibid.*, p. 12.

[17] *Ibid.*, p. 2.

[18] The U.S. Government maintains no systematic statistics on foreign students in the United States. The figures used by the National Science Foundation are derived from data compiled by the Institute for International Education, a private organization which receives some public funding to administer student exchange programs.

[19] National Science Board, Science & Engineering Indicators, 1996, Washington, DC: U.S. Government Printing Office, 1996. (NSB 96-21), pp. 2-23, and Appendix Table 2-7.

[20] *Ibid.*, pp. 2-23 and Appendix Tables 2-19, 2-27 and 2-29.

[21] *Ibid.*, Appendix Table 2-27.

[22] *Ibid.*

[23] *Ibid.*, Appendix Table 2-29.

[24] *Ibid*., pp. 2-19.

[25] Hearing, *Missile Proliferation in the Information Age*., p. 14.

[26] National Science Board, Text Table 2-11.

[27] *Ibid*.

[28] Hearing, *Missile Proliferation in the Information Age*, p. 4.

[29] Hillary Mann, *Open Admissions: U.S. Policy Toward Students from Terrorism-Supporting Countries in the Middle East*, Research Memorandum Number Thirty-Four, The Washington Institute for Middle East Studies, September 1997, p. 5.

[30] U.S. Immigration and Naturalization Service, *Controls Governing Foreign Students and Schools That Admit Them, Final Report on Foreign Student Controls*, December 22, 1995, 1-1, cited in Mann, p. 5.

[31] Mann, p. 5.

[32] The figures are for Iran (4789), Iraq (467), Libya (104), Sudan (1404) and Syria (3003). Mann, p. 6.

[33] *Ibid*.

[34] Hearing, *Missile Proliferation in the Information Age*, p. 1.

[35] National Aeronautics Space Administration, NASA Homepage, http://www.nasa.gov/, November 11, 1997.

[36] NASA Scientific and Technical Information Program, NASA Scientific and Technical Information Server,

http://www.sti.nasa.gov/STI-homepage.html, November 11, 1997.

[37] *Ibid.*

[38] NASA Fact Sheet, "What is the NASA Center for AeroSpace Information (CASI)?," undated.

[39] One example is a report entitled "Design and Testing of Ballistic Missiles," a Russian language text covering propulsion, structures, system engineering, design of missile complexes, and testing. John London, "National Intelligence Estimate On Emerging Missile Threats to North America; Comments, Assessments, Cautions," Briefing, Department of Defense, Ballistic Missile Defense Organization, April 4, 1996.

[40] Robert Windrem, "How Soviets stole a shuttle, Part 2: Codename: Farewell," MSNBC, http://www.msnbc.com/news/112811.asp, November 4, 1997.

[41] Robert Windrem, "How Soviets stole a shuttle, Part 1: Paranoia and online espionage," MSNBC, http://www.msnbc.com/news/112796.asp, November 4, 1997.

[42] Quoted in Windrem, "How Soviets stole a shuttle, Part 1."

[43] *Ibid*.

[44] According to its homepage (http://www.fedworld.gov/ntis/ntishome.html), NTIS is "the official resource for government-sponsored U.S. and worldwide scientific, technical, engineering, and business-related information." According to its web site (http://www.dtic.mil/dtic/about.html), "In a nutshell, DTIC provides information—records of planned, ongoing, or completed Defense-related research—to U.S. Government agencies and their contractors." Because of the nature of the information that DTIC handles, users must qualify for service from DTIC. However, a significant portion of DTIC held information is available to the general public from the National Technical Information Service. Additionally, DTIC provides several World Wide Web sites, including DefenseLINK, the official DoD Home Page, as well as anonymous ftp sites to anyone on the public Internet.

[45] Windrem, "How Soviets stole a shuttle, Part 1."

[46] American Institute of Aeronautics and Astronautics, "AIAA Aerospace Database," http://www.aiaa.org/publications/database.html.

[47] COSMIC University of Georgia, COSMIC – "NASA's Partner for Software Technology Transfers," http://www.cosmic.uga.edu/.

[48] COSMIC University of Georgia, "About COSMIC and our Services," http://www.cosmic.uga.edu/pub/cosinfo.html.

[49] London, pp. 8-16.

[50] David Hoffman, "Russian Turmoil Reaches Nuclear Sanctum," *Washington Post*, December 22, 1996, p. A29.

[51] Steven Erlanger, "U.S. Tells Moscow to Halt Ballistic Missile Aid to Iran," *New York Times*, August 22, 1997.

[52] Telephone conversation, subcommittee staff member with CIA official, August 29, 1997.

[53] David Hoffman, "Russian Missile Gyroscopes Were Sold to Iraq," *Washington Post*, September 12, 1997, p. A1.

[54] *Ibid.*

[55] *Ibid*.

[56] Peter Cary, "How Surplus American Arms Get Into the Wrong Hands," *U.S. News & World Report*, December 9, 1996, http://www.usnews.com/usnews/issue/9ARMS.HTM.

[57] "SNAFU: Military and weapon components coded for destruction before demilitarization are available at auctions and through locator services to civilians," *60 Minutes*, December 1, 1996.

[58] Hearing, *Missile Proliferation in the Information Age*, p. 16.

[59] Cary, http://www.usnews.com/usnews/issue/9ARMS.HTM.

[60] *Ibid*.

[61] Hearing, *Missile Proliferation in the Information Age*, p. 2.

[62] Bruce D. Norwall, "GPS Success Sparks New Concerns for Users," *Aviation Week and Space Technology*, December 1, 1997, p. 58. Also see http:www.magellangps.com for a description of available hand-held GPS receivers.

[63] Memorandum to Subcommittee for International Security, Proliferation, and Federal Services from Capt. Steven A. Leonard, Air Force Countermeasures Branch Chief, August 28, 1997.

[64] Hearing, *Missile Proliferation in the Information Age*, p. 28.

[65] Hearing, *Missile Proliferation in the Information Age*, p. 41. The Atlas II was derived from the Atlas, the Titans II and IV from the Titan II ICBM, and the Delta from the Thor IRBM.

[66] *Ibid*.

[67] Hearing, *Missile Proliferation in the Information Age*, p. 40.

[68] "Seventh Successful Launch for Iridium LLC; Five Additional Satellites Now in Orbit," Iridium press release, http://www.iridium.com, November 8, 1997.

[69] Teledesic LLC, http://www.teledesic.com/overview/html, November 14, 1997.

[70] U.S. Congress, House Commerce Committee Subcommittee on Telecommunications, Trade, and Consumer Protection Hearing on October 30,1997, *Video Competition*, 105th Cong., Sess. 1, 1997, p. 1. "Primestar ranks highest in J.D. Power and Associates 1997 Cable/Satellite subscriber satisfaction survey", October 1, 1997, http://www.primestar.com/ezget/ezget-f.htm, November 1, 1997.

[71] Hearing, *Missile Proliferation in the Information Age*, p. 9.

[72] Richard Rhodes, Dark Sun; the Making of the Hydrogen Bomb, (New York: Simon & Schuster), 1995, p. 363.

[73] McGeorge Bundy, Danger and Survival, (New York: Vintage Books, 1988), p. 197.

[74] U.S. Congress, Senate Armed Services Comittee Hearing, *Worldwide Threat to the United States*, 104th Cong., 1st Sess., 1995, p. 66.

[75] The V-2 was thought to have a solid propellant (cordite), when, in fact, it was liquid fueled (liquid oxygen and alcohol). British ballistics experts were relatively unfamiliar with research on liquid propulsion. Their own experiments involved solid fuel. An intelligence official wrote after the war that "where our experts were wrong was in assuming that the Germans were trying to make an enormously enlarged version of a schoolboy rocket." See R.V. Jones, The Wizard War: British Scientific Intelligence, *1939-1945*, (New York: Coward, McCann & Geoghegan, Inc., 1978), p. 343. Accurate photo interpretation combined with this inaccurate assumption about propulsion yielded large overestimates of the weight of the missile and its warhead. The V-2 was believed to weigh as much as 60-100 tons and to carry a 2-8 ton warhead. In actuality, the V-2 was a 13-ton missile with a 1-ton warhead. Prime Minister Churchill's chief scientific adviser argued that a missile weighing tens of tons would be impossible to launch and therefore the whole business was a hoax to divert attention from some real weapon under development. Those who believed the missile was not a hoax expected, again on the basis of British experiments, that it would be launched from a "long projector" or large gun. A half dozen huge concrete structures in northern France were identified as launch sites for the missile and attacked by allied bombers. Two of these facilities actually had been built to support the V-2. After the initial attacks, however, they were abandoned. The Germans made some cosmetic repairs for deception purposes, but planned to fire the V-2 from mobile launchers. Despite the large-scale allied air offensive (Operation Crossbow) to eliminate the V-2 and the V-l armed, pilotless aircraft (the buzz bomb), "[t]here is no convincing evidence that a V.2 [sic] launching-platform ever received a direct hit." Basil Collier, The Battle of the V-Weapons, *1944-1945* (New York: William Morrow & Co., 1965), p. 139.

[76] Hearing, *Missile Proliferation in the Information Age*, p. 5.

[77] *Ibid*.

[78] *Ibid*.

[79] Apparently the United States obtained evidence of the CSS-2 transfer, which was sufficiently clear to make the official announcement, in January 1988. The Saudis made initial overtures to the Chinese in 1985 and received agreement in principle to the sale in July 1985. Detailed negotiations about the sale began no later than December 1986. David B. Ottaway, "Saudis Hid Acquisition of Missiles," *Washington Post*, March 28, 1988, p. Al; HRH General Khaled Bin Sultan, Desert Warrior. A Personal View of the Gulf War by the Joint Forces Commander (New York: Harper Collins, 1995), p. 138.

[80] Sultan, pp. 142-145.

[81] *Ibid.*, p. 145

[82] "Saudi Purchase of Chinese Missiles Changes Middle East Military Balance," Av*iation Week & Space Technology*, March 22, 1988, p. 30; Ottaway, "Saudis Hid Acquisition of Missiles," p. A13.

[83] Sultan, pp. 138-141, 145-149.

[84] Aaron Karp, Ballistic Missile Proliferation: The Politics and Technics (Oxford: SIPRI, 1996), p. 92.

[85] Bill Gertz, "State, Pentagon worry about Saudi missiles," *Washington Times*, May 12, 1988, p. A3.

[86] Bill Gertz, "Saudis building launch bases for nuclear-capable missiles," *Washington Times*, March 18, 1988, p. Al.

[87] *Ibid.*, p. Al.

[88] Ottaway, "Saudis Hid Acquisition of Missiles," p. A13.

[89] William Safire, "Those Chinese Missiles," *New York Times*, February 23, 1989, and U.S. Congress, Congressional Record, 101st Cong., 1st Sess., 1989, p. S5448.

[90] Sultan, p. 150.

[91] Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War. Volume IV: The Gulf War (Boulder, CO: Westview Press, 1996), p. 850. The authors cite various estimates for the Al Hussein's warhead size, ranging from 300 kilograms (660 pounds) to as low as 250 pounds (about 113 kilograms).

[92] W. Seth Carus, Missiles in the Middle East: A New Threat to Stability, Policy Focus Research Memorandum number six, Washington Institute for Near East Policy, June 1988, p.11, and U.S. Congress, House Committee on Foreign Affairs, Subcommittees on Arms Control, International Security and Science, and on International Economic Policy and Trade, Hearing on July 12, 1989, *Missile Proliferation: The Need for Controls (Missile Technology Control Regime)*, 1990, p. 123.

[93] Michael Elleman and John Harvey, "The Proliferation of Ballistic Missiles: What is the Threat?" in Kathleen C. Bailey and Robert S. Rudney, Proliferation and Export Controls (Lanham, MD: University Press of America, 1993), p. 33.

[94] W. Seth Carus and Joseph S. Bermudez, Jr., "Iraq's *Al Husayn* Missile Programme (part 2)" *Jane's Soviet Intelligence Review*, June 1990, p. 242.

[95] Hearing, *Missile Proliferation in the Information Age*, p.6. The Department of Defense states that almost one-third of the population of Tehran evacuated the city in response to the missile attacks. Department of Defense, *Conduct of the Persian Gulf War* (Washington: U.S. Government Printing Office, April 1992), p. 13.

[96] Gregory S. Jones, The Iraqi Ballistic Missile Program: The Gulf War and the Future of the Missile Threat (Marina del Rey, CA: American Institute for Strategic Cooperation, Summer 1992), p.16; Carus and Bermudez, p. 242.

[97] Gulf War Air Power Survey (Washington: U.S. Government Printing Office, 1993), Volume II, Part 2, p. 318.

[98] Steven Zaloga, "Ballistic Missiles in the Third World: Scud and Beyond," *International Defense Review*, November 1988, p. 1425. See also Carus and Bermudez, "Iraq's *Al Husayn* Missile Programme, (part 1)," *Jane's Soviet Intelligence Review*, May 1990, p. 207.

[99] U.S. Congress, Senate Committee on Armed Services Hearings on *Crisis in the Persian Gulf Region: U.S. Policy Options and Implications*, 1990, p. 488.

[100] *This Week*, ABC News, November 16, 1997.

[101] Karp, pp. 852-853, and Cordesman and Wagner, pp. 852-853

[102] Cordesman and Wagner, *Ibid.*

[103] *Ibid.*, and Subhy Haddad *(Reuters)*, "Iraq Announces Launch of Three-Stage Rocket," *Philadelphia Inquirer*, December 8, 1989, p. A25.

[104] Jones, p. 68.

[105] Carus and Bermudez, p. 246.

[106] Cordesman and Wagner, pp. 852-853.

[107] Michael R. Gordon, "Iraq Announces Test of a Rocket; U.S. Fails to Confirm Launching," *New York Times*, December 8, 1989, p. A14; Michael R. Gordon, "U.S. Confirms Iraq Has Launched Rocket That Can Carry Satellites," *New York Times*, December 9, 1989, p. 7.

[108] Carus and Bermudez, p. 247.

[109] U.S. Congress, Senate Committee on Armed Services. Hearings, *Crisis in the Persian Gulf Region: U.S. Policy Options and Implications*, 1990, S. Hrg. 101-1071, p. 489.

[110] *Foreign Missile Threats: Analytical Soundness of Certain National Intelligence Estimates*, U.S. General Accounting Office, GAO/NSIAD-96-225, August 30, 1996, p. 3.

[111] *Ibid*, p. 2.

[112] *Foreign Missile Threats: Analytic Soundness of National Intelligence Estimate 95-19*, U.S. General Accounting Office, GAO/T-NSIAD-97-53, December 4, 1996.

[113] U.S. Congress, Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services Hearing, *Proliferation and U.S. Export Controls*, 105th Cong., 1st Sess., June 11, 1997, p. 47.

[114] Hearing, *Missile Proliferation in the Information Age*, p. 28.

[115] The Missile Technology Control Regime, ACDA Fact Sheet, http://www.acda.gov/factshee/exptcon/mtcr96.htm, September 15, 1997.

[116] *Ibid*.

[117] *Ibid*.

[118] *Ibid*.

[119] Hearing, *Missile Proliferation in the Information Age*, p. 39.

[120] *Ibid*., p. 9.

[121] "Do We Need a Missile Defense System?" *The Washington Times*, May 14, 1996, p. A15.

[122] U.S. Congress, Senate Governmental Affairs Subcommittee on International Security, Proliferation, and Federal Services, Hearing, *North Korean Missile Proliferation*, 105th Cong., 1st Sess., October 21, 1997, p. 14.

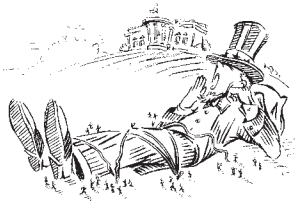
[123] Bill Gertz, "North Korea Cited For Missile Activity," *Washington Times*, Sept 27, 1997.

[124] Hearing, *Missile Proliferation in the Information Age*, p. 43.

[125] *Ibid*.

[126] Leonard, Memorandum to Subcommittee.

[127] Hearing, *Missile Proliferation in the Information Age*, p. 3.



Conclusion

A multifaceted, coordinated approach is necessary to combat proliferation. Diplomacy, arms control and export controls, unilateral incentives and disincentives, and counterproliferation efforts such as interdiction must all be used if the battle against proliferation is to be successful. As Winston Churchill once observed, though, in history "the terrible ifs accumulate."

The Clinton Administration's nonproliferation efforts have been inadequate. A *Washington Post* editorial pointed out on October 23, 1997, "[t]he subject is the current and possible future possession of weapons of mass destruction by an array of nations, including some deeply hostile to the United States and others in a position to wreak much harm. The administration is not showing a sure or steady hand in dealing with these supremely important matters." The Clinton Administration has not been willing to take the tough actions necessary to back up the rhetoric in executive orders and other statements. And, by relaxing dual-use export controls the Administration has allowed the United States to join the ranks of the proliferators.

The Clinton Administration has not been willing to take the tough actions necessary to back up the rhetoric in executive orders and other statements. And, by relaxing dual-use export controls the Administration has allowed the United States to join the ranks of the proliferators.

Though many nations that are key suppliers have joined or agreed to abide by regimes such as the MTCR, Australia Group, and Nuclear Suppliers Group, these export control regimes are not enough. The regimes – which impose no sanctions for violations, and which only the United States supports with statutes to punish violators – can only slow the spread of WMD and ballistic missile technology. As the Clinton Administration's former Assistant Secretary of Defense for International Security Policy, Ashton Carter, observed, "[e]xport controls alone cannot prevent proliferation," because determined leaders such as Saddam Hussein can "home grow their weapons of mass destruction or get them from other countries."

Even regimes requiring on-site inspections for verification are insufficient by themselves to eradicate the problem. Despite six years of intrusive U.N. inspections which have destroyed much of Iraq's weapons of mass destruction and ballistic missile programs, Saddam Hussein retains the ability to reconstitute these capabilities quickly.

And Saddam Hussein's achievements are not isolated examples. Consider the nations that, under the aegis of the Nuclear Non-Proliferation Treaty of 1968, have made substantial progress toward acquiring nuclear weapons. Moreover, despite signing the Biological Weapons Convention (BWC), Russia and Iraq have each admitted to maintaining biological weapons programs, while other nations, like China, are widely believed to have done so as well. In its annual report to Congress for 1996, the U.S. Arms Control and Disarmament Agency said, "…there are strong indications that China probably maintains its offensive [biological weapons] program. The United States, therefore, believes that in the years after its accession to the BWC, China was not in compliance with its BWC obligations and that it is highly probable that it remains noncompliant with these obligations." Problems are not automatically solved by arms control agreements or multilateral export control regimes.

Some believe proliferation is best contained by discussions with China and Russia. But proliferation continues, encouraged by the traditional allies of rogue regimes and emerging rogue-to-rogue supply systems. Criminal activity, especially by countries in political turmoil such as Russia, also facilitates proliferation. Against such activity, as the Clinton Administration's first Director of Central Intelligence, James Woolsey, has observed, "[t]here is no possibility for diplomacy, demarches,

hotlines or summits. These tools have no meaning to groups whose business is the criminal exploitation of individuals and even governments through threats, intimidation, and murder." Proliferation is exacerbated, too, by the natural flow of information as the formerly obscure art of missile-making, for example, becomes increasingly familiar.

Although there are many ways to deliver weapons of mass destruction against the United States, that roughly two dozen countries have or are working to develop ballistic missiles – and that the trend is toward longer ranges – indicates these platforms are the delivery vehicle of choice.

The Subcommittee's first witness in 1997, Dr. Walter B. Slocombe, Clinton Administration Under Secretary of Defense for Policy, said, "…I and the administration are quite willing to acknowledge that if we saw a rogue State, a potential proliferant, beginning to develop a long-range ICBM capable of reaching the United States, we would have to give very, very serious attention to deploying a limited national missile defense so as to be able to protect against that threat…." This confirms that the Administration considers retaliatory threats inadequate to protect the United States from long-range ballistic missiles.

Even though we must do all we can to deter the use by others of long-range missiles, "…against long-range missile threats, missile defenses are a necessary part of new deterrent strategies," as the Senate observed in the START II Resolution of Ratification.

On October 18, 1994, President Clinton said in a press conference, "[t]here is nothing more important to our security and to the world's stability than preventing the spread of nuclear weapons and ballistic missiles." As recently as December 16, 1997, Secretary of State Madeleine Albright called the proliferation threat "the most overriding security interest of our time."

Some nations like Iran make no secret of their desire for ballistic missiles capable of reaching the United States armed with weapons of mass destruction. This vulnerability must end. Missile defense, along with the other approaches already discussed, is integral to reducing the proliferation threat to America. It is time for the Administration to announce that America will no longer be endangered by ballistic missile-delivered destruction from rogue states. The time for debating whether to deploy a national missile defense is over.

Appendix A

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release November 14, 1994

EXECUTIVE ORDER
#12938

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PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the International Emergency Economic Powers Act (50 U.S.C. 1701 et seq.), the National Emergencies Act (50 U.S.C. 1601 et seq.), the Arms Export Control Act, as amended (22 U.S.C. 2751 et seq.), Executive Orders Nos. 12851 and 12924, and section 301 of title 3, United States Code,

I, WILLIAM J. CLINTON, President of the United States of America, find that the proliferation of nuclear, biological, and chemical weapons ("weapons of mass destruction") and of the means of delivering such weapons, constitutes an unusual and extraordinary threat to the national security, foreign policy, and economy of the United States, and hereby declare a national emergency to deal with that threat.

Accordingly, I hereby order:

Section 1. International Negotiations. It is the policy of the United States to lead and seek multilaterally coordinated efforts with other countries to control the proliferation of weapons of mass destruction and the means of delivering such weapons. Accordingly, the Secretary of State shall cooperate in and lead multilateral efforts to stop the proliferation of weapons of mass destruction and their means of delivery.

Sec. 2. Imposition of Controls. As provided herein, the Secretary of State and the Secretary of Commerce shall use their respective authorities, including the Arms Export Control Act and the International Emergency Economic Powers Act, to control any exports, to the extent they are not already controlled by the Department of Energy and the Nuclear Regulatory Commission, that either Secretary determines would assist a country in acquiring the capability to develop, produce, stockpile, deliver, or use weapons of mass destruction or their means of delivery. The Secretary of State shall pursue early negotiations with foreign governments to adopt effective measures comparable to those imposed under this order.

Sec. 3. Department of Commerce Controls. (a) The Secretary of Commerce shall prohibit the export of any goods, technology, or services subject to the Secretary's export jurisdiction that the Secretary of Commerce determines, in consultation with the Secretary of State, the Secretary of Defense, and other appropriate officials, would assist a foreign country in acquiring the capability to develop, produce, stockpile, deliver, or use weapons of mass destruction or their means of delivery. The Secretary of State shall pursue early negotiations with foreign governments to adopt effective measures comparable to those imposed under this section.

(b) Subsection (a) of this section will not apply to exports relating to a particular category of weapons of mass destruction (i.e., nuclear, chemical, or biological weapons) if their destination is a country with whose government the United States has entered into a bilateral or multilateral arrangement for the control of that category of weapons of mass destruction-related goods (including delivery systems) and technology, or maintains domestic export controls comparable to controls that are imposed by the United States with respect to that category of goods and technology, or that are otherwise deemed adequate by the Secretary of State.

(c) The Secretary of Commerce shall require validated licenses to implement this order and shall coordinate any license applications with the Secretary of State and the Secretary of Defense.

(d) The Secretary of Commerce, in consultation with the Secretary of State, shall take such actions, including the promulgation of rules, regulations, and amendments thereto, as may be necessary to continue to regulate the activities of United States persons in order to prevent their participation in activities that could contribute to the proliferation of weapons of mass destruction or their means of delivery, as provided in the Export Administration Regulations, set forth in Title 15, Chapter VII, Subchapter C, of the Code of Federal Regulations, Parts 768 to 799 inclusive.

Sec. 4. Sanctions Against Foreign Persons. (a) In addition to the sanctions imposed on foreign persons as provided in the National Defense Authorization Act for Fiscal Year 1991 and the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991, sanctions also shall be imposed on a foreign person with respect to chemical and biological weapons proliferation if the Secretary of State determines that the foreign person on or after the effective date of this order or its predecessor, Executive Order No. 12735 of November 16, 1990, knowingly and materially contributed to the efforts of any foreign country, project, or entity to use, develop, produce, stockpile, or otherwise acquire chemical or biological weapons.

(b) No department or agency of the United States Government may procure, or enter into any contract for the procurement of, any goods or services from any foreign person described in subsection (a) of this section. The Secretary of the Treasury shall prohibit the importation into the United States of products produced by that foreign person.

(c) Sanctions pursuant to this section may be terminated or not imposed against foreign persons if the Secretary of State determines that there is reliable evidence that the foreign person concerned has ceased all activities referred to in subsection (a).

(d) The Secretary of State and the Secretary of the Treasury may provide appropriate exemptions for procurement contracts necessary to meet U.S. operational military requiorments or requirements under defense production agreements, sole source suppliers, spare parts, components, routine servicing and maintenance of products, and medical and humanitarian items. They may provide exemptions for contracts in existence on the date of this order under appropriate circumstances.

Sec. 5. Sanctions Against Foreign Countries. (a) In addition to the sanctions imposed on foreign countries as provided in the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991, sanctions also shall be imposed on a foreign country as specified in subsection (b) of this section, if the Secretary of State determines that the foreign country has, on or after the effective date of this order or its predecessor, Executive Order No. 12735 of November 16, 1990, (1) used chemical or biological weapons in violation of international law; (2) made substantial preparations to use chemical or biological weapons in violation of international law; or (3) developed, produced, stockpiled, or otherwise acquired chemical or biological weapons in violation of international law.

(b) The following sanctions shall be imposed on any foreign country identified in subsection (a)(1) of this section unless the Secretary of State determines, on grounds of significant foreign policy or national security, that any individual sanction should not be applied. The sanctions specified in this section may be made applicable to the countries identified in subsections (a)(2) or (a)(3) when the Secretary of State determines that such action will further the objectives of this order pertaining to proliferation. The sanctions specified in subsection (b)(2) below shall be imposed with the concurrence of the Secretary of the Treasury.

(1) Foreign Assistance. No assistance shall be provided to that country under the Foreign Assistance Act of 1961, or any successor act, or the Arms Export Control Act, other than assistance that is intended to benefit the people of that country directly and that is not channeled through governmental agencies or entities of that country.

(2) Multilateral Development Bank Assistance. The United States shall oppose any loan or financial or technical assistance to that country by international financial institutions in accordance with section 701 of the International Financial Institutions Act (22 U.S.C. 262d).

(3) Denial of Credit or Other Financial Assistance. The United States shall deny to that country any credit or financial assistance by any department, agency, or instrumentality of the United States Government.

(4) Prohibition of Arms Sales. The United States Government shall not, under the Arms Export Control Act, sell to that country any defense articles or defense services or issue any license for the export of items on the United States Munitions List.

(5) Exports of National Security-Sensitive Goods and Technology. No exports shall be permitted of any goods or technologies controlled for national security reasons under the Export Administration Regulations.

(6) Further Export Restrictions. The Secretary of Commerce shall prohibit or otherwise substantially restrict exports to that country of goods, technology, and services (excluding agricultural commodities and products otherwise subject to control).

(7) Import Restrictions. Restrictions shall be imposed on the importation into the United States of articles (that may include petroleum or any petroleum product) that are the growth, product, or manufacture of that country.

(8) Landing Rights. At the earliest practicable date, the Secretary of State shall terminate, in a manner consistent with international law, the authority of any air carrier that is controlled in fact by the government of that country to engage in air transportation (as defined in section 101(10) of the Federal Aviation Act of 1958 (49 U.S.C. App. 1301(10)).

Sec. 6. Duration. Any sanctions imposed pursuant to sections 4 or 5 of this order shall remain in force until the Secretary of State determines that lifting any sanction is in the foreign policy or national security interests of the United States or, as to sanctions under section 4 of this order, until the Secretary has made the determination under section 4(c).

Sec. 7. Implementation. The Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce are hereby authorized and directed to take such actions, including the promulgation of rules and

regulations, as may be necessary to carry out the purposes of this order. These actions, and in particular those in sections 4 and 5 of this order, shall be made in consultation with the Secretary of Defense and, as appropriate, other agency heads and shall be implemented in accordance with procedures established pursuant to Executive Order No. 12851. The Secretary concerned may redelegate any of these functions to other officers in agencies of the Federal Government. All heads of departments and agencies of the United States Government are directed to take all appropriate measures within their authority to carry out the provisions of this order, including the suspension or termination of licenses or other authorizations.

Sec. 8. Preservation of Authorities. Nothing in this order is intended to affect the continued effectiveness of any rules, regulations, orders, licenses, or other forms of administrative action issued, taken, or continued in effect heretofore or hereafter under the authority of the International Economic Emergency Powers Act, the Export Administration Act, the Arms Export Control Act, the Nuclear Non-proliferation Act, Executive Order No. 12730 of September 30, 1990, Executive Order No. 12735 of November 16, 1990, Executive Order No. 12924 of August 18, 1994, and Executive Order No. 12930 of September 29, 1994.

Sec. 9. Judicial Review. This order is not intended to create, nor does it create, any right or benefit, substantive or procedural, enforceable at law by a party against the United States, its agencies, officers, or any other person.

Sec. 10. Revocation of Executive Orders Nos. 12735 and 12930. Executive Order No. 12735 of November 16, 1990, and Executive Order No. 12930 of September 29, 1994, are hereby revoked.

Sec. 11. Effective Date. This order is effective immediately.

This order shall be transmitted to the Congress and published in the Federal Register.

WILLIAM J. CLINTON

THE WHITE HOUSE,
November 14, 1994.

# # #

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release November 12, 1997

NOTICE

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CONTINUATION OF EMERGENCY REGARDING
WEAPONS OF MASS DESTRUCTION

On November 14, 1994, by **Executive Order 12938**, I declared a national emergency with respect to the unusual and extraordinary threat to the national security, foreign policy, and economy of the United States posed by the proliferation of nuclear, biological, and chemical weapons ("weapons of mass destruction") and the means of delivering such weapons. Because the proliferation of weapons of mass destruction and the means of delivering them continues to pose an unusual and extraordinary threat to the national security, foreign policy, and economy of the United States, the national emergency declared on November 14, 1994, and extended on November 14, 1995, must continue in effect beyond November 14, 1996. Therefore, in accordance with section 202(d) of the National Emergencies Act (50 U.S.C. 1622(d)), I am continuing the national emergency declared in Executive Order 12938.

This notice shall be published in the Federal Register and transmitted to the Congress.

WILLIAM J. CLINTON

THE WHITE HOUSE,
November 12, 1996.

# # #

Appendix B

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release December 6, 1995

EXECUTIVE ORDER
#12981
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ADMINISTRATION OF EXPORT CONTROLS

By the authority vested in me as President by the Constitution and the laws of the United States of America, including but not limited to the International Emergency Economic Powers Act (50 U.S.C. 1701 et. seq.) ("the Act"), and in order to take additional steps with respect to the national emergency described and declared in Executive Order No. 12924 of August 19, 1994, and continued on August 15, 1995, I, WILLIAM J. CLINTON, President of the United States of America, find that it is necessary for the procedures set forth below to apply to export license applications submitted under the Act and the Export Administration Regulations (15 C.F.R. Part 730 et. seq.) ("the Regulations") or under any renewal of, or successor to, the Export Administration Act of 1979, as amended (50 U.S.C. App. 2401 et. seq.) ("the Export Administration Act"), and the Regulations. Accordingly, it is hereby ordered as follows:

Section 1. License Review. To the extent permitted by law and consistent with Executive Order No. 12924 of August 19, 1994, the power, authority, and discretion conferred upon the Secretary of Commerce ("the Secretary") under the Export Administration Act to require, review, and make final determinations with regard to export licenses, documentation, and other forms of information submitted to the Department of Commerce pursuant to the Act and the Regulations or under any renewal of, or successor to, the Export Administration Act and the Regulations, with the power of successive redelegation, shall continue. The Departments of State, Defense, and Energy, and the Arms Control and Disarmament Agency each shall have the authority to review any export license application submitted to the Department of Commerce pursuant to the Act and the Regulations or under any renewal of, or successor to, the Export Administration Act and the Regulations. The Secretary may refer license applications to other United States Government departments or agencies for review as appropriate. In the event that a department or agency determines that certain types of applications need not be referred to it, such department or agency shall notify the Department of Commerce as to the specific types of such applications that it does not wish to review. All departments or agencies shall promptly respond, on a case-by-case basis, to requests from other departments or agencies for historical information relating to past license applications.

Sec. 2. Determinations. (a) All license applications submitted under the Act and the Regulations or any renewal of, or successor to, the Export Administration Act and the Regulations, shall be resolved or referred to the President no later than 90 calendar days after registration of the completed license application.

(b) The following actions related to processing a license application submitted under the Act and the Regulations or any renewal of, or successor to, the Export Administration Act and the Regulations shall not be counted in calculating the time periods prescribed in this order:

(1) Agreement of the Applicant. Delays upon which the Secretary and the applicant mutually agree.

(2) Prelicense Checks. Prelicense checks through government channels that may be required to establish the identity and reliability of the recipient of items controlled under the Act and the Regulations or any renewal of, or successor to, the Export Administration Act and the Regulations, provided that:

(A) the need for such prelicense check is established by the Secretary, or by another department or agency if the request for prelicense check is made by such department or agency;

(B) the Secretary requests the prelicense check within 5 days of the determination that it is necessary; and

(C) the Secretary completes the analysis of the result of the prelicense check within 5 days.

(3) Requests for Government-To-Government Assurances. Requests for government-to-government assurances of suitable end-use of items approved for export under the Act and the Regulations or any renewal of, or successor to, the Export Administration Act and the Regulations, when failure to obtain such assurances would result in rejection of the application, provided that:

(A) the request for such assurances is sent to the Secretary of State within 5 days of the determination that the assurances are required;

(B) the Secretary of State initiates the request of the relevant government within 10 days thereafter; and

(C) the license is issued within 5 days of the Secretary's receipt of the requested assurances. Whenever such prelicense checks and assurances are not requested within the time periods set forth above, they must be accomplished within the time periods established by this section.

(4) Multilateral Reviews. Multilateral review of a license application as provided for under the Act and the Regulations or any renewal of, or successor to, the Export Administration Act and the Regulations, as long as multilateral review is required by the relevant multilateral regime.

(5) Consultations. Consultation with other governments, if such consultation is provided for by a relevant multilateral regime or bilateral arrangement as a precondition for approving a license.

Sec. 3. Initial Processing. Within 9 days of registration of any license application, the Secretary shall, as appropriate:

(a) request additional information from the applicant. The time required for the applicant to supply the additional information shall not be counted in calculating the time periods prescribed in this section.

(b) refer the application and pertinent information to agencies or departments as stipulated in section 1 of this order, and forward to the agencies any relevant information submitted by the applicant that could not be reduced to electronic form.

(c) assure that the stated classification on the application is correct; return the application if a license is not required; and, if referral to other departments or agencies is not required, grant the application or notify the applicant of the Secretary's intention to deny the application.

Sec. 4. Department or Agency Review. (a) Each reviewing department or agency shall specify to the Secretary, within 10 days of receipt of a referral as specified in subsection 3(b), any information not in the application that would be required to make a determination, and the Secretary shall promptly request such information from the applicant. If, after receipt of the information so specified or other new information, a reviewing department or agency concludes that additional information would be required to make a determination, it shall promptly specify

that additional information to the Secretary, and the Secretary shall promptly request such information from the applicant. The time that may elapse between the date the information is requested by the reviewing department or agency and the date the information is received by the reviewing department or agency shall not be counted in calculating the time periods prescribed in this order. Such information specified by reviewing departments or agencies is in addition to any information that may be requested by the Department of Commerce on its own initiative during the first 9 days after registration of an application.

(b) Within 30 days of receipt of a referral and all required information, a department or agency shall provide the Secretary with a recommendation either to approve or deny the license application. As appropriate, such recommendation may be with the benefit of consultation and discussions in interagency groups established to provide expertise and coordinate interagency consultation. A recommendation that the Secretary deny a license shall include a statement of the reasons for such recommendation that are consistent with the provisions of the Act and the Regulations or any renewal of, or successor to, the Export Administration Act and the Regulations and shall cite both the statutory and the regulatory bases for the recommendation to deny. A department or agency that fails to provide a recommendation within 30 days with a statement of reasons and the statutory and regulatory bases shall be deemed to have no objection to the decision of the Secretary.

Sec. 5. Interagency Dispute Resolution. (a) Committees. (1)(A) Export Administration Review Board. The Export Administration Review Board ("the Board"), which was established by Executive Order No. 11533 of June 4, 1970, and continued in Executive Order No. 12002 of July 7, 1977, is hereby continued. The Board shall have as its members, the Secretary, who shall be Chair of the Board, the Secretary of State, the Secretary of Defense, the Secretary of Energy, and the Director of the Arms Control and Disarmament Agency. The Chairman of the Joint Chiefs of Staff and the Director of Central Intelligence shall be nonvoting members of the Board. No alternate Board members shall be designated, but the acting head or deputy head of any member department or agency may serve in lieu of the head of the concerned department or agency. The Board may invite the heads of other United States Government departments or agencies, other than the departments or agencies represented by the Board members, to participate in the activities of the Board when matters of interest to such departments or agencies are under consideration.

(B) The Secretary may, from time to time, refer to the Board such particular export license matters, involving questions of national security or other major policy issues, as the Secretary shall select. The Secretary shall also refer to the Board any other such export license matter, upon the request of any other member of the Board or the head of any other United States Government department or agency having any interest in such matter. The Board shall consider the matters so referred to it, giving due consideration to the foreign policy of the United States, the national security, the domestic economy, and concerns about the proliferation of armaments, weapons of mass destruction, missile delivery systems, and advanced conventional weapons and shall make recommendations thereon to the Secretary.

2) Advisory Committee on Export Policy. An Advisory Committee on Export Policy ("ACEP") is established and shall have as its members the Assistant Secretary of Commerce for Export Administration, who shall be Chair of the ACEP, and Assistant Secretary-level representatives of the Departments of State, Defense, and Energy, and the Arms Control and Disarmament Agency. Appropriate representatives of the Joint Chiefs of Staff and of the Nonproliferation Center of the Central Intelligence Agency shall be nonvoting members of the ACEP. Representatives of the departments or agencies shall be the appropriate Assistant Secretary or equivalent (or appropriate acting Assistant Secretary or equivalent in lieu of the Assistant Secretary or equivalent) of the concerned department or agency, or appropriate Deputy Assistant Secretary or equivalent (or the appropriate acting Deputy Assistant Secretary or equivalent in lieu of the Deputy Assistant Secretary or equivalent) of the concerned department or agency. Regardless of the department or agency representative's rank, such representative shall speak and vote at the ACEP on behalf of the appropriate Assistant Secretary or equivalent of such department or agency. The ACEP may invite Assistant Secretary-level representatives of other United States Government departments or agencies, other than the departments and agencies represented by the ACEP members, to participate in the activities of the ACEP when matters of interest to such departments or agencies are under consideration.

(3)(A) Operating Committee. An Operating Committee ("OC") of the ACEP is established. The Secretary shall appoint its Chair, who shall also serve as Executive Secretary of the ACEP. Its other members shall be representatives of appropriate agencies in the Departments of Commerce, State, Defense, and Energy, and the Arms Control and Disarmament Agency. The appropriate representatives of the Joint Chiefs of Staff and the Nonproliferation Center of the Central Intelligence Agency shall be nonvoting members of the OC. The OC may invite representatives of other United States Government departments or agencies, other than the departments and agencies represented by the OC members, to participate in the activities of the OC when matters of interest to such departments or agencies are under consideration.

(B) The OC shall review all license applications on which the reviewing departments and agencies are not in agreement. The Chair of the OC shall consider the recommendations of the reviewing departments and agencies and inform them of his or her decision on any such matters within 14 days after the deadline for receiving department and agency recommendations. As described below, any reviewing department or agency may appeal the decision of the Chair of the OC to the Chair of the ACEP. In the absence of a timely appeal, the Chair's decision will be final.

(b) Resolution Procedures. (1) If any department or agency disagrees with a licensing determination of the Department of Commerce made through the OC, it may appeal the matter to the ACEP for resolution. A department or agency must appeal a matter within 5 days of such a decision. Appeals must be in writing from an official appointed by the President by and with the advice and consent of the Senate, or an officer properly acting in such capacity, and must cite both the statutory and the regulatory bases for the appeal. The ACEP shall review all departments' and agencies' information and recommendations, and the Chair of the ACEP shall inform the reviewing departments and agencies of the majority vote decision of the ACEP within 11 days from the date of receiving notice of the appeal. Within 5 days of the majority vote decision, any dissenting department or agency may appeal the decision by submitting a letter from the head of the department or agency to the Secretary in his or her capacity as the Chair of the Board. Such letter shall cite both the statutory and the regulatory bases for the appeal. Within the same period of time, the Secretary may call a meeting on his or her own initiative to consider a license application. In the absence of a timely appeal, the majority vote decision of the ACEP shall be final.

(2) The Board shall review all departments' and agencies' information and recommendations, and such other export control matters as may be appropriate. The Secretary shall inform the reviewing departments and agencies of the majority vote of the Board within 11 days from the date of receiving notice of appeal. Within 5 days of the decision, any department or agency dissenting from the majority vote decision of the Board may appeal the decision by submitting a letter from the head of the dissenting department or agency to the President. In the absence of a timely appeal, the majority vote decision of the Board shall be final.

Sec. 6. The license review process in this order shall take effect beginning with those license applications registered by the ecretary 60 days after the date of this order and shall continue in effect to the extent not inconsistent with any renewal of the Export Administration Act, or with any successor to that Act.

Sec. 7. Judicial Review. This order is intended only to improve the internal management of the executive branch and is not intended to, and does not, create any rights to administrative or judicial review, or any other right or benefit or trust responsibility, substantive or procedural, enforceable by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

WILLIAM J. CLINTON

THE WHITE HOUSE,
December 5, 1995.

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release October 15, 1996

EXECUTIVE ORDER

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AMENDMENT TO EXECUTIVE ORDER 12981

By the authority vested in me as President by the Constitution and the laws of the United States of America, including but not limited to the International Emergency Economic Powers Act (50 U.S.C. 1701 et seq.), and in order to take additional steps with respect to the national emergency described and declared in Executive Order 12924 of August 19, 1994, and continued on August 15, 1995, and August 14, 1996, in order to amend Executive Order 12981 as that order applies to the processing of applications for the export of any commercial communication satellites and any hot-section technologies for the development, production, and overhaul of commercial aircraft engines that are transferred from the United States Munitions List to the Commerce Control List pursuant to regulations issued by the Departments of Commerce and State after the effective date of this order, it is hereby ordered as follows:

Section 1. Amendment of Executive Order 12981. (a) Section 5(a)(3)(B) of Executive Order 12981 is amended to read as follows:

(B) The OC shall review all license applications on which the reviewing departments and agencies are not in agreement. The Chair of the OC shall consider the recommendations of the reviewing departments and agencies and inform them of his or her decision on any such matters within 14 days after the deadline for receiving department and agency recommendations. However, for license applications concerning commercial communication satellites and hot-section technologies for the development, production, and overhaul of commercial aircraft engines that are transferred from the United States Munitions List to the Commerce Control List pursuant to regulations issued by the Departments of Commerce and State after the date of this order, the Chair of the OC shall inform reviewing departments and agencies of the majority vote decision of the OC. As described below, any reviewing department or agency may appeal the decision of the Chair of the OC, or the majority vote decision of the OC in cases concerning the commercial communication satellites and hot-section technologies described above, to the Chair of the ACEP. In the absence of a timely appeal, the Chair's decision (or the

majority vote decision in the case of license applications concerning the commercial communication satellites and hot-section technologies described above) will be final.

(b) Section 5(b)(1) of Executive Order 12981 is amended to read as follows:

(1) If any department or agency disagrees with a licensing determination of the Department of Commerce made through the Chair of the OC (or a majority vote decision of the OC in the case of license applications concerning the commercial communication satellites and the hot-section technologies described in section 5(a)(3)(B)), it may appeal the matter to the ACEP for resolution. A department or agency must appeal a matter within 5 days of such a decision. Appeals must be in writing from an official appointed by the President, by and with the advice and consent of the Senate, or an officer properly acting in such capacity, and must cite both the statutory and the regulatory bases for the appeal. The ACEP shall review all departments' and agencies' information and recommendations, and the Chair of the ACEP shall inform the reviewing departments and agencies of the majority vote decision of the ACEP within 11 days from the date of receiving notice of the appeal. Within 5 days of the majority vote decision, any dissenting department or agency may appeal the decision by submitting a letter from the head of the department or agency to the Secretary in his or her capacity as the Chair of the Board. Such letter shall cite both the statutory and the regulatory bases for the appeal. Within the same 5-day period, the Secretary may call a meeting on his or her own initiative to consider a license application. In the absence of a timely appeal, the majority vote decision of the ACEP shall be final.

Sec. 2. Judicial Review. This order is not intended to create, nor does it create, any rights to administrative or judicial review, or any other right or benefit or trust responsibility, substantive or procedural, enforceable by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

Sec. 3. Effective Date. This order shall be effective immediately and shall remain in effect until terminated.

WILLIAM J. CLINTON

THE WHITE HOUSE
October 12, 1996

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release November 15, 1996

EXECUTIVE ORDER

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ADMINISTRATION OF EXPORT CONTROLS ON ENCRYPTION PRODUCTS

By the authority vested in me as President by the Constitution and the laws of the United States of America, including but not limited to the International Emergency Economic Powers Act (50 U.S.C. 1701 et seq.), and in order to take additional steps with respect to the national emergency described and declared in Executive Order 12924 of August 19, 1994, and continued on August 15, 1995, and on August 14, 1996, I, WILLIAM J. CLINTON, President of the United States of America, have decided that the provisions set forth below shall apply to administration of the export control system maintained by the Export Administration Regulations, 15 CFR Part 730 et seq. ("the EAR"). Accordingly, it is hereby ordered as follows:

Section 1. Treatment of Encryption Products. In order to provide for appropriate controls on the export and foreign dissemination of encryption products, export controls of encryption products that are or would be, on this date, designated as defense articles in Category XIII of the United States Munitions List and regulated by the United States Department of State pursuant to the Arms Export Control Act, 22 U.S.C. 2778 et seq. ("the AECA"), but that subsequently are placed on the Commerce Control List in the EAR, shall be subject to the following conditions: (a) I have determined that the export of encryption products described in this section could harm national security and foreign policy interests even where comparable products are or appear to be available from sources outside the United States, and that facts and questions concerning the foreign availability of such encryption products cannot be made subject to public disclosure or judicial review without revealing or implicating classified information that could harm United States national security and foreign policy interests. Accordingly, sections 4(c) and 6(h)(2)-(4) of the Export Administration Act of 1979 ("the EAA"), 50 U.S.C. App. 2403(c) and 2405(h)(2)-(4), as amended and as continued in effect by Executive Order 12924 of August 19, 1994, and by notices of August 15, 1995, and August 14, 1996, all other analogous provisions of the EAA relating to foreign availability, and the regulations in the EAR relating to such EAA provisions, shall not be applicable with respect to export controls on such encryption products. Notwithstanding this, the Secretary of Commerce ("Secretary") may, in his discretion, consider the foreign availability of comparable encryption products in determining whether to issue a license in a particular case or to remove controls on particular products, but is not required to issue licenses in particular cases or to remove controls on particular products based on such consideration;

(b) Executive Order 12981, as amended by Executive Order 13020 of October 12, 1996, is further amended as follows:

(1) A new section 6 is added to read as follows: "Sec. 6. Encryption Products. In conducting the license review described in section 1 above, with respect to export controls of encryption products that are or would be, on November 15, 1996, designated as defense articles in Category XIII of the United States Munitions List and

regulated by the United States Department of State pursuant to the Arms Export Control Act, 22 U.S.C. 2778 et seq., but that subsequently are placed on the Commerce Control List in the Export Administration Regulations, the Departments of State, Defense, Energy, and Justice and the Arms Control and Disarmament Agency shall have the opportunity to review any export license application submitted to the Department of Commerce. The Department of Justice shall, with respect to such encryption products, be a voting member of the Export Administration Review Board described in section 5(a)(1) of this order and of the Advisory Committee on Export Policy described in section 5(a)(2) of this order. The Department of Justice shall be a full member of the Operating Committee of the ACEP described in section 5(a)(3) of this order, and of any other committees and consultation groups reviewing export controls with respect to such encryption products."

(2) Sections 6 and 7 of Executive Order 12981 of December 5, 1995, are renumbered as new sections 7 and 8, respectively.

(c) Because the export of encryption software, like the export of other encryption products described in this section, must be controlled because of such software's functional capacity, rather than because of any possible informational value of such software, such software shall not be considered or treated as "technology," as that term is defined in section 16 of the EAA (50 U.S.C. App. 2415) and in the EAR (61 Fed. Reg. 12714, March 25, 1996);

(d) With respect to encryption products described in this section, the Secretary shall take such actions, including the promulgation of rules, regulations, and amendments thereto, as may be necessary to control the export of assistance (including training) to foreign persons in the same manner and to the same extent as the export of such assistance is controlled under the AECA, as amended by section 151 of Public Law 104-164;

(e) Appropriate controls on the export and foreign dissemination of encryption products described in this section may include, but are not limited to, measures that promote the use of strong encryption products and the development of a key recovery management infrastructure; and

(f) Regulation of encryption products described in this section shall be subject to such further conditions as the President may direct.

Sec. 2. Effective Date. The provisions described in section 1 shall take effect as soon as any encryption products described in section 1 are placed on the Commerce Control List in the EAR.

Sec. 3. Judicial Review. This order is intended only to improve the internal management of the executive branch and to ensure the implementation of appropriate controls on the export and foreign dissemination of encryption products. It is not intended to, and does not, create any rights to administrative or judicial review, or any other right or benefit or trust responsibility, substantive or procedural, enforceable by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

WILLIAM J. CLINTON

THE WHITE HOUSE,
November 15, 1996.

Appendix C

Director of Central Intelligence

The Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions

July - December 1996

June 1997

Scope Note

The DCI submitted this biannual report in response to a Congressionally directed action in Section 721 of the FY 1997 Intelligence Authorization Act.

"(a) Not later than 6 months after the date of the enactment of this Act, and every 6 months thereafter, the Director of Central Intelligence shall submit to Congress a report on

(1) the acquisition by foreign countries during the preceding 6 months of dual-use and other technology useful for the development or production of weapons of mass destruction (including nuclear weapons, chemical weapons, and biological weapons) and advanced conventional munitions; and

(2) trends in the acquisition of such technology by such countries."

At the DCI's request, the Nonproliferation Center (NPC) drafted this report and coordinated it throughout the Intelligence Community. As directed by Section 721, subsection (b) of the Act, it is unclassified.

THE ACQUISITION OF TECHNOLOGY RELATING TO WEAPONS OF MASS DESTRUCTION AND ADVANCED CONVENTIONAL MUNITIONS

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THE ACQUISITION OF TECHNOLOGY RELATING TO WEAPONS OF MASS DESTRUCTION AND ADVANCED CONVENTIONAL MUNITIONS

Introduction

The threat from the proliferation of weapons of mass destruction and missiles is one of the highest priorities for intelligence. In the US effort to counter weapons proliferation, the Intelligence Community has taken an active role in supporting US government initiatives to strengthen export controls in supplier countries and to work with other countries to prevent the sale of weapons of mass destruction (WMD), advanced conventional weapons, and their related technologies. While it is an extremely difficult problem, US government efforts have made some progress, making both the acquisition and development of WMD more difficult and costly for proliferators.

Interdiction of WMD and the technologies necessary to acquire a WMD capability is a key component in the acquisition prevention effort. We see interdiction efforts falling into three basic categories:

- Preventing the transfer of materials through export controls and international nonproliferation regimes;
- Halting the transfer or the negotiation of transfer of materials through diplomatic and liaison initiatives;
- Seizing proscribed materials in transit, through law enforcement agencies in cooperation with the Intelligence Community.

Interdiction efforts are an extremely important part of our overall nonproliferation strategy. By themselves, however, they generally do not get countries out of the business of proliferation. They do, though, buy time for other initiatives that may be more successful in halting or rolling back a WMD program. These other initiatives can include:

- Diplomatic efforts designed to reduce the perceived need for a WMD capability;
- Education efforts to show that WMD-related funds would be better spent elsewhere;
- Bilateral or multilateral incentives. Such incentives could be financial, including membership in an international economic forum, in exchange for halting or rolling back a WMD program;
- Military assistance or security guarantees.

The US clearly leads the way in programs in all three classes of interdiction efforts. US export license applications of concern are scrutinized by a number of agencies, including the Intelligence Community. The US also is developing procedures to share appropriate end user information with key allies in an effort to strengthen our mutual export control activities. In addition, the procedures for alerting other governments of impending

transfers and tracking resulting actions are in place and working. Interdictions of shipments are occurring.

An example of a successful interdiction would be the seizure of chemical precursors destined for Libya. Although such a seizure would not halt Tripoli's aggressive chemical weapons development program, at a minimum it would:

- Slow Tripoli's ability to begin serial production of chemical agents;
- Provide the US time to persuade supplier nations or companies to halt future shipments to Libya;
- Allow the Intelligence Community and US law enforcement agencies to identify and target new intelligence sources that could contribute to rolling back Libya's CW program;
- Increase the cost to Libya of its CW development program.

Interdiction successes rest, in large measure, not on the quantity of information available to the policymaker, but on the quality. This is true for all three classes of interdictions. In licensing, for example, policymakers need unambiguous intelligence information before making a decision to deny a license, thereby denying a sale for the US company. Likewise, demarches to other governments must be accurate, or the US will be accused of crying wolf and lose support from even friendly countries. And interdictions of shipments in transit often become international incidents, and potential embarrassment if the targeted material is not found in the shipment. Actionable intelligence in support of interdiction efforts requires more than cooperation between US intelligence, policy, and law enforcement agencies. It demands close working relationships between the United States and other foreign governments committed to halting the proliferation of WMD. Such relationships will, of course, include intelligence sharing arrangements, but equally important are diplomatic, military, and scientific exchanges at all levels. As noted above, interdiction programs by themselves cannot halt the proliferation of WMD. Alternative suppliers and technologies, increasing use of denial and deception, and a growing ability to produce indigenously weapons or their component parts are opening new avenues to states or organizations determined to obtain a WMD capability. The increasing diffusion of modern technology through the growth of the world market is making it harder to detect illicit diversions of materials and technologies relevant to a weapons program.

We are addressing these new challenges with more aggressive efforts, which go beyond traditional cold-war efforts aimed merely at understanding weapons and associated plans. We are better integrating technical analysis with political, military, and diplomatic analysis to provide policymakers with information on the motivations that drive foreign actions and decisions, and on influential opposition forces that could support initiatives to diminish or eliminate the proliferation threat.

Our concerns are not limited to interdicting materials and technologies to state-sponsored WMD development programs. As worrisome, in our judgment, are terrorist groups and cults that seek to acquire or develop chemical and biological weapons on their

own. For example, the incidents staged in March 1995 by the Japanese cult Aum Shinrikyo demonstrate the use of WMD is no longer restricted to the battlefield. Terrorist groups and violent sub-national groups need not acquire a massive infrastructure to create a deadly, arsenal. Only small quantities of precursors, available on the open market, are needed.

Interdiction efforts are further complicated by the fact that most WMD programs are based on dual-use technologies and materials that have legitimate civilian or military applications unrelated to WMD. For example, chemicals used to make nerve agents are also used to make plastics and to process foodstuffs; trade in those technologies cannot be banned.

Nonproliferation regimes provide international standards to gauge and address behavior. They provide diplomatic tools to isolate and punish violators. The past few years, many states have joined these regimes and outsiders are encountering new pressures to join. Procurement costs have risen because of the need for convoluted efforts to hide purchases. That said, these regimes can be deceived by determined proliferators. The sheer volume of international commerce, increased self-sufficiency, and the global diffusion of technology and its dual-use nature make the regimes' road ahead a difficult one. Intelligence will play an increasingly important role in maintaining their effectiveness. Protecting sources throughout this process will be a challenge.

Following are summaries by country of ACW- and WMD-related acquisition activities (solicitations, negotiations, contracts, and deliveries) that occurred between 1 July and 31 December 1996.

Acquisition by Country:

We chose to exclude countries that already have substantial ACW and WMD programs such as China and Russia, as well as countries of lower priority that demonstrated little acquisition activity of concern.

Egypt

During the last half of 1996, Egypt obtained Scud-related ballistic missile equipment from North Korea and Russia.

India

India sought some items for its ballistic missile program during the reporting period from a variety of sources. It also sought nuclear-related items, some of which may have been intended for its nuclear weapons program.

Iran

Iran continues to be one of the most active countries seeking to acquire all types of WMD technology and advanced conventional weapons. Its efforts in the last half of 1996 have focused on acquiring production technology that will give Iran an indigenous

production capability for all types of WMD. Numerous interdiction efforts by the US government have interfered with Iranian attempts to purchase arms and WMD-related goods, but Iran's acquisition efforts remain unrelenting.

For the reporting period, China and Russia have been primary sources for missile-related goods. Iran obtained the bulk of its CW equipment from China and India. Iran sought dual-use biotech equipment from Europe and Asia, ostensibly for civilian uses. Iran was actively seeking modern tanks, SAMs, and other arms from the Commonwealth of Independent States (CIS), China, and Europe. Besides some large projects with China, Iranian nuclear-related purchases were not focused on any particular countries and were only indirectly related to nuclear weapons production.

Iraq

We have not observed Iraq purchasing advanced conventional weapons or WMD-related goods, although it has purchased numerous dual-use items.

Libya

Despite the UN embargo, Libya continued to aggressively seek ballistic missile-related equipment, materials, and technology from Europe, the CIS, and the Far East. CW-related purchases diminished, however.

North Korea

North Korea's WMD programs are largely indigenous. We observed no significant procurement involving ACW or WMD-related goods.

Pakistan

Pakistan was very aggressive in seeking out equipment, material, and technology for its nuclear weapons program, with China as its principal supplier. Pakistan also sought a wide variety of nuclear-related goods from many Western nations, including the United States. China also was a major supplier to Pakistan's ballistic missile program, providing technology and assistance. Of note, Pakistan has made strong efforts to acquire an indigenous capability in missile production technologies.

Syria

Syria continued to seek CW- and Scud-related goods during the reporting period. Russia and Eastern Europe were the primary target for CW-related purchases, while North Korea and Iran have become important suppliers of Scud-related equipment and materials.

Key Suppliers:

China

During the last half of 1996, China was the most significant supplier of WMD-related goods and technology to foreign countries. The Chinese provided a tremendous variety of assistance to both Iran's and Pakistan's ballistic missile programs. China also was the primary source of nuclear-related equipment and technology to Pakistan, and a key supplier to Iran during this reporting period. Iran also obtained considerable CW-related assistance from China in the form of production equipment and technology.

Russia

Russia supplied a variety of ballistic missile-related goods to foreign countries during the reporting period, especially to Iran. Russia was an important source for nuclear programs in Iran and, to a lesser extent, India and Pakistan. Russia also negotiated the sale of advanced weapon systems, such as the SA-10 to Cyprus, and is an important target for Middle Eastern countries seeking to upgrade and replace their existing arms.

North Korea

North Korea continued to export Scud-related equipment and materials to countries of concern during this reporting period.

Germany

Among Western nations, Germany was the favorite target for foreign WMD programs. German export controls were effective in thwarting many of these attempts, but some dual-use goods were exported, purportedly to civilian end users.

Trends

Despite our efforts, countries of concern continued last year to acquire substantial amounts of WMD-related equipment, materials, and technology, as well as modern conventional weapons. China and Russia continued to be the primary suppliers, and are key to any future efforts to stem the flow of dual-use goods and modern weapons to countries of concern.

Countries determined to maintain WMD programs over the long term have been placing significant emphasis on securing their programs against interdiction and disruption. In response to broader, more effective export controls, these countries have been trying to reduce their dependence on imports by developing an indigenous production capability. Many Third World countries—with Iran being the most prominent example—are responding to Western counter-proliferation efforts by relying more on legitimate commercial firms as procurement fronts and by developing more convoluted procurement networks. Should countries such as Iran ever become self-sufficient producers and exporters of WMD-related goods and conventional weapons, however, opportunities to prevent acquisition will be dramatically limited.

Appendix D

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Nuclear, Biological, Chemical, and Missile Proliferation Sanctions: Selected Current Law

November 25, 1997

Prepared for the Subcommittee on International Security, Proliferation, and Federal Services of the U.S. Senate Committee on Governmental Affairs

Foreign Affairs and National Defense Division

Nuclear, Biological, Chemical, and Missile Proliferation Sanctions: Selected Current Law

The use of sanctions specifically to stem weapons proliferation is a relatively new development in U.S. foreign policy. While earlier legislation required the cutoff of foreign aid to countries engaged in specified nuclear proliferation activities and mentioned other sanctions as a possible mechanism for bringing countries into compliance with goals of treaties or international agreements,[1] it was not until 1990 that Congress enacted explicit guidelines for trade sanctions related to missile proliferation. A requirement for the President to impose sanctions against U.S. persons or foreign persons engaging in trade of items or technology listed in the Missile Technology Control Regime Annex (MTCR Annex) was added that year to the Arms Export Control Act and to the Export Administration Act of 1979. Subsequently, Congress legislated economic sanctions against countries that contribute to the proliferation of chemical, biological, and nuclear weapons in a broad array of laws. Following is an alphabetic listing and brief description of legal provisions that require or authorize the imposition of some form of economic sanction against countries, companies, or persons who violate U.S. nonproliferation norms. [2]

[1] The International Atomic Energy of 1954 and the Nuclear Non-Proliferation Act of 1978 sought to increase international participation in and adherence with the International Atomic Energy Agency and Nuclear Non-Proliferation Treaty, respectively, and, to that end, authorized the President to enter into international discussions, including the imposition of sanctions against those who abrogate or violate these international agreements.

[2] The list is arranged alphabetically, with references to U.S. Code and *Legislation on Foreign Relations* in parentheses, where applicable. Legislative history of pertinent amendments is also given, in italics.

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- Sec. 5 – national security controls
- Sec. 6 – foreign policy controls
- Sec. 11A – multilateral export control violations
- Sec. 11B – missile proliferation control violations
- Sec. 11C – chemical and biological weapons proliferation sanctions

Export-Import Bank Act of 1945 (Public Law 79-173) 12
- Sec. 2 – nuclear proliferation

Foreign Assistance Act of 1961 (Public Law 87-195) 13
- Sec. 620A – international terrorism
- Sec. 620E – Pakistan, nuclear explosive device development
- Sec. 620G – international terrorism
- Sec. 620H – international terrorism

[3] Authority granted by the Export Administration Act expired on August 20, 1994. The President continued its provisions in Executive Order 12924 of August 19, 1994 (59 FR 43437).

International Emergency Economic Powers Act (Public Law 95-223) 15
- Sec. 203 – broad Presidential authority relating to national emergency

Iran-Iraq Arms Nonproliferation Act of 1992 (Public Law 102-484) 15
- Sec. 1603 – broad range of prohibitions against transactions with Iraq
- Sec. 1604 – mandatory sanctions against persons assisting Iran or Iraq in acquiring chemical, biological, nuclear, or destabilizing numbers and types of advanced conventional weapons
- Sec. 1605 – mandatory sanctions against foreign governments assisting Iran or Iraq in acquiring chemical, biological, nuclear, or destabilizing numbers and types of advanced conventional weapons

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- Sec. 586C – continues sanctions from Iraq-Kuwait crisis
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Nuclear Non-Proliferation Act of 1978 (Public Law 95-242) 17
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Nuclear Proliferation Prevention Act of 1994 (Public Law 103-236) 18
- Sec. 821 – U.S. Government procurement sanctions
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- Sec. 824 – prohibition of financial assistance for nuclear proliferation

18 U.S.C. (relating to criminal procedure)

18 USC 2332a makes it an offense to use, threaten to use, attempt or conspire to use weapons of mass destruction (WMD) against a national of the United States or within the United States. Weapons of mass destruction include "any biological agent, toxin, or vector." One found to have used a WMD in such a way "shall be imprisoned for any term of years or for life, and if death results, shall be punished by death or imprisoned for any term of years of for life."

18 USC 2332c states punishment guidelines for anyone found to have used, attempted or conspired to use a chemical weapon against: (1) a U.S. national outside the United States, (2) any person within the United States; or (3) any property owned, leased or used by the United States, here or abroad. Punishment may be any term of imprisonment up to life or, if death occurs from the person's actions, a years-term of imprisonment up to life or the death penalty.

Sec. 60023(a) of Public Law 103-322 (108 Stat. 1980) added sec. 2332a. The section was substantially reworked by the Antiterrorism and Effective Death Penalty Act of 1996 (Public Law 104-132; approved April 24, 1996). Sec. 521(a) of that Act added 18 USC 2332c.

Agreement for Nuclear Cooperation Between the United States and China, Joint Resolution Approving the Proposed Agreement for Nuclear Cooperation (Public Law 99-183; 99 Stat. 1174) *(LFR '94, vol. IV, p. 384)*

The agreement requires Presidential certification that China is not violating section 129 of the Atomic Energy Act of 1954, which places restrictions on exports to nations that assist or encourage non-nuclear weapon states to acquire nuclear weapons.

No amendments.

Arms Export Control Act (Public Law 90-629; approved October 22, 1968) *(LFR '96, vol. I-A, p. 301)*

The Arms Export Control Act (AECA), as amended, authorizes U.S. Government military sales, loans, leases, and financing, and licensing of commercial arms sales to other countries. The AECA coordinates such actions with other foreign policy considerations,including nonproliferation, and determines eligibility of recipients for military exports, sales, leases, loans, and financing.

Section 3(f) (22 U.S.C. 2753(f)) prohibits U.S. military sales or leases to any country that the President determines is in material breach of binding commitments to the United States under international treaties or agreements regarding nonproliferation of nuclear explosive devices and unsafeguarded special nuclear material.

Subsec. (f) was added by sec. 822(a)(1) of the Nuclear Proliferation Prevention Act (title VIII of the Foreign Relations Authorization Act, Fiscal Years 1994 and 1995); Public Law 103-236; approved April 30, 1994.

Section 38 (22 U.S.C. 2778) authorizes the President to control the import and export of defense articles and services, to provide foreign policy guidelines to U.S. importers/exporters, and to promulgate the United States Munitions List constituting what defense articles and services are regulated. Section 38(c) establishes that any person who willfully violates any provision of the section (or of section 39 relating to the reporting of fees, contributions, gifts, and commissions paid by those involved in commercial sales of defense articles or services) may be fined not more than $1 million, imprisoned not more than ten years, or both. Section 38(e) caps the civil penalty for violations under this section at $500,000.

Section 38 was added by sec. 212(a)(1) of the International Security Assistance and Arms Export Control Act of 1976; Public Law 94-329; approved June 30, 1976. Subsec. (c) was added by the 1976 amendment; the fine and imprisonment terms were amended, however, by sec. 119(a) of the International Security and Development Cooperation Act of 1985; Public Law 99-83; approved August 8, 1985. Formerly, fine was "not more than $100,000," and period of imprisonment was not more than two years. Subsec. (e) was added by the 1976 amendment. Sec. 119(b) of Public Law 99-83, in 1985, however, added the language that caps civil penalties.

Section 40 (22 U.S.C. 2780) prohibits exporting or otherwise providing munitions, providing financial assistance to facilitate transfer of munitions, granting eligibility status for such transfers, issuing licenses for such transfers, or otherwise facilitating the acquisition of munitions to a country the government of which "has repeatedly provided support for acts of international terrorism." The section includes in its definition of acts of international terrorism, "all activities that the Secretary [of State] determines willfully aid or abet the international proliferation of nuclear explosive devices to individuals or groups or willfully aid or abet an individual or groups in acquiring unsafeguarded special nuclear material."

The President may rescind the Secretary's determination (sec. 40(f)) by reporting to the Speaker of the House and the Chairman of the Senate Foreign Relations Committee, before issuing the rescission, that the leadership and policies of the country in question have changed, the government is not supporting international terrorism, and the government has issued assurances that it will not support international terrorism in the future. Congress may block the rescission of the terrorist determination by enacting a joint resolution. The President, however, may unilaterally waive any or all of the prohibitions in this section if he determines to do so is essential to the national security interests of the United States, and so reports to Congress.

Section 40 was added by the Omnibus Diplomatic Security and Antiterrorism Act of 1986 (Public Law 99-399; approved August 27, 1986), and later amended and restated by the Anti-Terrorism and Arms Export Amendments Act of 1989 (Public Law 101-222; approved August 27, 1986). Sec. 822(a)(2)(A) of the Nuclear Proliferation Prevention Act of 1994 (title VIII of the Foreign Relations Authorization Act, Fiscal Years 1994 and 1995; Public Law 103-236; approved April 30, 1994) added a definition of acts of international terrorism that would lead the Secretary of State to make a determination. The same section added definitions "nuclear explosive device" and "unsafeguarded special nuclear material". Sec. 321 of the Foreign Relations Authorization Act, Fiscal Years 1992 and 1993 (Public Law 102-138; approved October 28, 1991) made technical changes to the guidelines for Congress's passage of a joint resolution relating to the section.

Sections 72 and 73 (22 U.S.C. 2797a, 2797b), require sanctions against any U.S. citizen or any foreign person whom the President determines to be engaged in exporting, transferring, conspiring to export or transfer, or facilitating an export or transfer of, any equipment or technology identified by the Missile Technology Control Regime (MTCR) that "contributes to the acquisition, design, development, or production of missiles in a country that is not an MTCR adherent ..."

Sanctions vary with the type of equipment or technology exported, and are increasingly severe where the type of equipment or technology is more controlled. Worst-case sanctions may be imposed for not less than 2 years, and include denial of U.S. Government contracts, denial of export licenses for items on the U.S. Munitions List, and a prohibition on importation into the United States.

The law allows several exceptions, wherein some or all of the sanctions may not be imposed against foreign persons:

- if an MTCR adherent finds the foreign person innocent of wrongdoing in relation to the transaction;

- if the State Department issues an advisory opinion to the individual stating that a transaction would not result in sanctions;

- if the export, transfer, or trading activity is authorized by the laws of an MTCR adherent and not obtained by misrepresentation or fraud;

- if the export, transfer, or trade is made to an end-user in a country that is an MTC adherent;

- in the case of foreign persons fulfilling contracts for defense services or defense articles; then the President will not prohibit importations if

  – the articles or services are considered essential to U.S. national security,
  – the President determines that the provider is a sole supplier and the articles or services are essential to U.S. national security, or
  – the President determines that the articles or services are essential to U.S. national security under defense cooperation agreements or NATO Programs of Cooperation;

- in the case of foreign persons importing products or services into the United States in fulfillment of contracts entered into before the President announces intentions to impose sanctions, then the President will not prohibit importations; or

- in the case of foreign persons providing spare parts, component parts essential to U.S. products or production, routine service and maintenance, essential information and technology.

The President may waive the sanction, for either a U.S. citizen or foreign person, if he certifies to Congress that it is essential to the national security of the United States, or that the individual provides a product or service essential to U.S. national security, and that that person is sole provider of the product or service.

Section 1703 of the National Defense Authorization Act for Fiscal Year 1991 (Public Law 101-510; approved November 5, 1990) added sections 71-74. In section 72, sec. 734(a) of the Foreign Relations Authorization Act, Fiscal Years 1994 and 1995 (Public Law 103-236; approved April 30, 1994) added paragraph about "presumption" in guidelines for Presidential determination on transfers of MTCR Annex materials. In sec. 73, sec. 323(a) of the Foreign Relations Authorization Act, Fiscal Years 1992 and 1993 (Public Law 102-138; approved October 28, 1991) added assisting another country in acquiring missiles to the list of sanctionable acts. Sec. 734(b) of the Foreign Relations Authorization Act, Fiscal Years 1994 and 1995 added the Director of the Arms Control and Disarmament Agency to those with whom the Secretary of State consults when administering the policy. Sec. 1408 of the National Defense Authorization Act for Fiscal Year 1996 (Public Law 104-106; approved February 10, 1996) made technical changes to reporting requirements relating to issuing a waiver.

Section 74 of the AECA (22 U.S.C. 2797c) provides definitions of terms that also affect how the sanctions may be applied. For example, while the MTCR is a policy statement originally announced on April 16, 1987, by the United States, the United Kingdom, Germany, France, Italy, Canada, and Japan, the term "MTCR adherent" in this law is much more broadly defined, to include the countries that participate in the MTCR "or that, pursuant to an international understanding to which the United States is a party, controls MTCR equipment or technology in accordance with the criteria and standards set forth in the MTCR." As another example, the term "person" has changed over time. The law formerly included as part of the definition of "person," "countries where it may be

impossible to identify a specific governmental entity." This has been amended to refer to "countries with non-market economies (excluding former members of the Warsaw Pact)." The same definition formerly restricted government activity relating to development of aircraft; this now refers specifically to military aircraft.

Sec. 323 of the Foreign Relations Authorization Act, Fiscal Years 1992 and 1993 (Public Law 102-138; approved October 28, 1991) amended the definition of "person" to target China—the "Helms amendment," and narrowed the definition of "person" to include activities of a government affecting the development of, among other things, "military aircraft" (formerly referred to "aircraft").

Section 81 (22 U.S.C. 2798) requires a sanction preventing government procurement, contracts with the U.S. Government, and imports from foreign persons who knowingly and materially contribute, through exports from the United States or another country, or through other transactions, to foreign efforts to use, develop, produce, stockpile, or otherwise acquire chemical or biological weapons. Foreign persons are sanctionable if the recipient country has used chemical or biological weapons in violation of international law, has used chemical or biological weapons against its own people, or has made preparations to engage in such violations. Foreign persons are sanctionable if the recipient country has been determined to be a supporter of international terrorism, pursuant to section 6(j) of the Export Administration Act, or if the President has specifically designated the country as restricted under this section.

The President may delay the imposition of sanctions for up to 180 days if he is in consultation with the sanctionable person's government to bring that government to take specific and effective steps to terminate the sanctionable activities. The President may not be required to impose sanctions if the sanctionable person otherwise provides goods needed for U.S. military operations, if the President determines that the sanctionable person is a sole source provider of some good or service, or if the President determines that goods and services provided by the sanctionable person are essential to U.S. national security under defense cooperation agreements. Exceptions are also made for completing outstanding contracts, the purchase of spare or component parts, service and maintenance otherwise not readily available, information and technology essential to U.S. products or production, or medical or other humanitarian items.

The President may terminate the sanctions after 12 months, if he determines and certifies to Congress that the sanctioned person no longer aids or abets any foreign government, project, or entity in its efforts to acquire biological or chemical weapons capability. The President may waive the application of a sanction after a year of its imposition, if he determines it is in U.S. national security interests to do so. Not less than 20 days before a national security waiver is issued, the President must notify Congress, fully explaining the rationale for waiving the sanction.

Sec. 81 was added by sec. 305 of the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 (title III of Public Law 102-182; approved December 4, 1991). [4]

Section 101 (22 U.S.C. 2799aa) (formerly section 669 of the Foreign Assistance Act of 1961) prohibits foreign economic or miliary assistance to any country that the President determines delivers or receives nuclear

[4] Two versions of the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 were enacted. Title V of the Foreign Relations Relations Authorization Act, Fiscal Years 1992 and 1993 (public Law 102-138; approved) enacted the first. Later in the same session, title III of Public Law 102-182 (a trade act otherwise unrelated to nonproliferation issues) repealed the first version and enacted a new Chemical and Biological Weapons Control and Warfare Elimination Act of 1991. This report refers only to the second enactment – that which currently stands in law.

enrichment equipment, materials, or technology. The prohibition is not required if the countries involved in the transaction agree to place all materials, equipment, or technology under multilateral safeguard arrangements. The prohibition is not required, furthermore, if the recipient country has an agreement with the International Atomic Energy Agency (IAEA) regarding safeguards.

The President may waive the sanction if he determines, and certifies to the Speaker of the House and the Senate Committee on Foreign Relations, that denying assistance would have a serious adverse effect on vital U.S. interests, and he has been assured that the country in question will not acquire, develop, or assist others in acquiring or developing nuclear weapons. Congress may negate a certification by enacting a joint resolution stating its disapproval.

Sec. 826(a) of the Nuclear Proliferation Prevention Act of 1994 (title VIII of the Foreign Relations Authorization Act, Fiscal Years 1994 and 1995; Public Law 103-236; approved April 30, 1994) added secs. 101 and 102. Similar language, however, had been in the Foreign Assistance Act, as secs. 669 and 670. Sec. 669 was added by sec. 305 of the International Security Assistance and Arms Export Control Act of 1976 (Public Law 94-329; approved June 30, 1976). The section was amended and restated by sec. 12 of the International Security Assistance Act of 1977 (Public Law 95-92; approved August 4, 1977), which also added sec. 670 to the law. Sec. 669 was further amended by secs. 10(b)(4) and 12 of the International Security Assistance Act of 1978 (Public Law 95-384; approved September 26, 1978). Sec. 737(b) of the International Security and Development Cooperation Act of 1981 (Public Law 97-113; approved December 29, 1981) amended and restated both secs. 669 and 670. Sec. 1204 of the International Security and Development Cooperation Act of 1985 (Public Law 99-83); approved August 8, 1985, made further changes to sec. 670 before both sections were repealed in 1994.

Section 102 (22 U.S.C. 2799aa-1) (formerly section 670 of the Foreign Assistance Act of 1961) prohibits foreign economic or military assistance to countries that the President determines deliver or receive nuclear reprocessing equipment, material, or technology to or from another country; or any non-nuclear-weapon state which illegally exports, through a person serving as that country's agent, from the United States items that would contribute to nuclear proliferation.

The President may waive the sanction if he determines, and certifies to the Speaker of the House and the Senate Committee on Foreign Relations, that terminating assistance would adversely impact on the United States' nonproliferation objectives, or would jeopardize the common defense and security. Congress may negate a certification by enacting a joint resolution stating its disapproval.

The section further prohibits assistance (except humanitarian or food assistance), defense sales, export licenses for U.S. Munitions List items, other export licenses subject to foreign policy controls, and various credits and loans to any country that the President has determined transfers a nuclear explosive device, design information, or component to a non-nuclear weapon state, or is a non-nuclear weapon state and receives a nuclear device, design information, or component, or detonates a nuclear explosive device.

The President may delay the imposition of these sanctions for 30 days, if he certifies to the Speaker of the House and Chairman of the Senate Committee on Foreign Relations that an immediate imposition would be detrimental to U.S. national security.

Atomic Energy Act of 1954 *(LFR '96, vol. II, p. 1440)*

The Atomic Energy Act of 1954 declares U.S. policy for the development, use, and control of atomic energy. The Act authorizes the Nuclear Regulatory Commission to oversee the export of special nuclear materials and nuclear technology in accordance with bilateral and international cooperation agreements negotiated by the

Department of State. The Act defines the nature and requirements of those cooperative agreements and the procedure by which Congress reviews them. The Act states export licensing criteria for nuclear materials and sensitive equipment and technology.

Section 129 (42 U.S.C. 2158) prohibits the transfer of nuclear materials, equipment, or sensitive technology from the United States to any non-nuclear-weapon state that the President finds to have detonated a nuclear explosive device, terminated or abrogated safeguards of the International Atomic Energy Agency (IAEA), materially violated an IAEA safeguards agreement, or engaged in manufacture or acquisition of nuclear explosive devices. The section similarly prohibits transfers to any country, or group of countries, that the President finds to have violated a nuclear cooperation agreement with the United States, assisted, encouraged, or induced a non-nuclear-weapon state to engage in certain activities related to nuclear explosive devices, or agreed to transfer reprocessing equipment, materials, or technology to a non-nuclear-weapon state, except under certain conditions.

The President may waive the restriction if he determines that the prohibition would hinder U.S. nonproliferation objectives or jeopardize the common defense and security. Sixty days before a determination is issued, the President is required to forward his reasons for waiving the sanctions to Congress, which may block the waiver by adopting a concurrent resolution. Congress may alternatively counter the Presidential determination with passage of a joint resolution within 45 days of the President's action.

Enacted as Public Law 83-703; approved August 30, 1954. Sec. 307 of the Nuclear Non-Proliferation Act of 1978 (Public Law 95-242; approved March 10, 1978) added sec. 129.

Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 (Public Law 102-182; approved December 4, 1991; 22 U.S.C. 5601-5606) *(LFR '96, vol. II, p. 1394)*

The Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 mandates U.S. sanctions, and encourages international sanctions, against countries that use chemical or biological weapons in violation of international law.

The Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 was enacted as title III of Public Law 102-182 (a law dealing with trade issues unrelated to nonproliferation). No amendments have been enacted.[5]

Section 307 (22 U.S.C. 5605) requires the President to terminate foreign assistance (except humanitarian, food, and agricultural assistance) arms sales and licenses, credits, guarantees, and certain exports to a government of a foreign country that he has determined has used or made substantial preparation to use chemical or biological weapons. Within three months, the President must determine and certify to Congress that the government: is no longer using chemical or biological weapons in violation of international law, is no longer using such weapons against its own people, has provided credible assurances that such behavior will not resume, and is willing to cooperate with U.N. or other international observers to verify that biological and chemical weapons are not still in use. Without this 3-month determination, sanctions are required affecting multilateral development bank loans, U.S. bank loans or credits, exports, imports, diplomatic relations, and aviation access to and from the United States.

[5] Two versions of the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 were enacted. Title V of the Foreign Relations Authorization Act, Fiscal years 1992 and 1993 (public Law 102-138; approved) enacted the first. Later in the same session, title III of Public Law 102-182 (a trade act otherwise unrelated to nonproliferation issues) repealed the first version and enacted a new Chemical and Biological Weapons Control and warfare Elimination Act of 1991. This report refers only to the second enactment – that which currently stands in law.

The President may lift the sanctions after a year, with a determination and certification to Congress that the foreign government has met the conditions listed above, and that it is making restitution to those affected by its use of chemical or biological weapons.

The President may waive the imposition of these sanctions if he determines and certifies to Congress and the appropriate committees that such a waiver is essential to U.S. national security interests.

Export Administration Act of 1979[6] *(LFR '96, vol. III, p. 1022)*

The Export Administration Act of 1979 (EAA) authorizes the executive branch to regulate private sector exports of particular goods and technology to other countries. The EAA coordinates such actions with other foreign policy considerations, including nonproliferation, and determines eligibility of recipients for exports. **Section 5 (50 U.S.C. app. 2404)** authorizes the President to curtail or prohibit the export of any goods or services for national security reasons: to comply with other laws regarding a potential recipient country's political status or political stability, to cooperate with international agreements or understandings, or to protect militarily critical technologies. **Section 6 (50 U.S.C. app. 2405)** similarly authorizes the President to curtail or prohibit the export of goods or services for foreign policy reasons. Within Section 6, for example, **Section 6(j)** establishes the State Department's list of countries found to be supporting acts of international terrorism, a list on which many other restrictions and prohibitions in law are based. **Section 6(k)** restricts exportation of certain crime control equipment. **Section 6(l)** restricts exportation for a list of dual use goods and technology. **Section 6(m)** restricts exportation for a list of goods and technology that would directly and substantially assist a foreign government or group in acquiring the capability to develop, produce, stockpile, or deliver chemical or biological weapons.

Section 11A (50 U.S.C. app. 2410a) requires the President to prohibit, for two to five years, the U.S. Government from contracting with or procuring goods or services from a foreign person that has violated any country's national security export regulations in accordance with the agreement of the Coordinating Committee for Multilateral Export Controls (COCOM),[7] and that the violation results "in substantial enhancement of Soviet and East Bloc capabilities in submarines or antisubmarine warfare, ballistic or antiballistic missiles technology, strategic aircraft, command, control, communications and intelligence, or other critical technologies." The President also is required generally to prohibit importation of products from the sanctioned person. The President may impose sanctions at his discretion if the first but not the second condition exists. In this case, the restrictions may be in place no longer than 5 years.

Sanctions may not be required for some goods if contracts with the sanctionable person meet U.S. operational military requirements, if the President determines that the sanctionable person is a sole source provider of an essential defense article or service, or if the President determines that such articles or services are essential to U.S. national security under defense coproduction agreements. The President also may not be required to apply

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[6] Authority granted by the Export Administration Act expired on August 20, 1994. The President continued its provisions in Executive Order 12924 of August 19, 1994 (59 FR 43437).

[7] The Coordinating Committee for Multilateral Export Controls (COCOM) agreed to cease to exist on March 31, 1994. Member nations agreed to retain current control lists until a successor organization is established. On December 19, 1995, the United States and 27 other countries, including NATO participants and Russia, agreed to establish a new multilateral export control arrangement. The Wassenaar Agreement for Export Controls for Conventional Arms and Dual-Use Goods and Technologies ("Wassenaar Arrangement") became operational in 1996, but is nonbinding.

sanctions if he determines that a company affiliated with the sanctionable person had no knowledge of the export control violation. After sanctions have been in place for 2 years, the President may modify terms of the restrictions under certain conditions, and if he notifies Congress.

Enacted as Public Law 96-72; approved September 29, 1979. Sec. 2444 of the Multilateral Export Control Enhancement Amendments Act (title II, subtitle D, part II of the Omnibus Trade and Competitiveness Act of 1988; Public Law 100-418; approved August 23, 1988) added sec. 11A. The section has not been amended.

Section 11B (50 U.S.C. app. 2410b) is similar to sections 72 and 73 of the AECA, but authorizes sanctions against U.S. persons and foreign persons who engage in commercial transactions that violate missile proliferation controls. The section requires sanctions against any U.S. citizen who the President determines to be engaged in exporting, transferring, conspiring to export or transfer, or facilitating an export or transfer of, any equipment or technology identified by the Missile Technology Control Regime Annex. Sanctions vary with the type of equipment or technology exported; worst-case sanctions deny export licenses for goods on the U.S. Commodity List for not less than 2 years.

The President may waive the imposition of sanctions if he certifies to Congress that the product or service to be restricted is essential to U.S. national security, and that the provider is a sole source provider.

The section further requires sanctions against any foreign person who the President determines to be engaged in exporting, transferring, conspiring to export or transfer, or facilitating an export or transfer of, any MTCR equipment or technology that contributes to the design, development, or production of missiles in a country that is not an MTCR adherent. Sanctions vary with the type of equipment or technology exported; worst-case sanctions deny licenses for transfer to the foreign person items otherwise controlled by the Export Administration Act for not less than 2 years. The President may also prohibit importation into the United States of products produced by the foreign person.

The law allows several exceptions, wherein some or all of the sanctions may not be imposed against foreign persons. These exceptions are nearly identical to those found in sections 72 and 73 of the AECA. The President may waive the imposition of sanctions for national security reasons, but must notify Congress beforehand. The Presidential authority to restrict importation is conditional in a manner identical to that in section 73 of the AECA.

The definition of "MTCR adherent" in section 11B is also identical to that in section 74 of the AECA. The definition of "person," however, retains its earlier form, applying to all "countries where it may be impossible to identify a specific governmental entity," and not adopting the narrower reference to military aircraft but referring to government activity relating to development of aircraft generally.

Sec. 1702(b) of the National Defense Authorization Act for Fiscal Year 1991 (Public Law 101-510; approved November 5, 1990) added sec. 11B. The section has not been amended.

Section 11C (50 U.S.C. app. 2410c), similar to Section 81 of the AECA, authorizes the President to apply procurement and import sanctions against foreign persons that he determines knowingly contribute to the use, development, production, stockpile, or acquisition of chemical or biological weapons by exporting goods or technology from the United States or any other country.

The President may delay the imposition of sanctions for up to 180 days if he is in consultation with the sanctionable person's government to bring that government to take specific and effective steps to terminate the sanctionable activities. The President may not be required to impose or maintain sanctions if the sanctionable

person otherwise provides goods needed for U.S. military operations, if the President determines that the sanctionable person is a sole source provider of some good or service, or if the President determines that goods and services provided by the sanctionable person are essential to U.S. national security under defense cooperation agreements. Exceptions are also made for completing outstanding contracts, the purchase of spare or component parts, service and maintenance otherwise not readily available, information and technology essential to U.S. products or production, or medical or other humanitarian items.

The President may terminate the sanctions after 12 months, if he determines and certifies to Congress that the sanctioned person no longer aids or abets any foreign government, project, or entity in its efforts to acquire biological or chemical weapons capability. The President may waive the application of a sanction after a year of its imposition, if he determines it is in U.S. national security interests to do so. Not less than 20 days before a national security waiver is issued, the President must notify Congress, fully explaining the rationale for waiving the sanction.

Sec. 505(a) of the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 (title III of Public Law 102-182; approved December 4, 1991) added sec. 11C. No amendments have been enacted.

Export-Import Bank Act of 1945 *(LFR '96, vol. III, p. 952)*

The Export-Import Bank Act of 1945 establishes the Export-Import Bank of the United States and authorizes the Bank to finance and facilitate exports and imports and the exchange of commodities and services between the United States and foreign countries.

Section 2(b)(1)(B) (12 U.S.C. 635(b)(1)(B)) generally states the United States' policy of administering loan programs through the Export-Import Bank. The section provides that the Bank will deny applications for credit for nonfinancial or noncommercial considerations only when the President determines it is in the U.S. national interest to deny credit to advance. U.S. policies in international terrorism, nuclear proliferation, environmental protection, and human rights.

The Export-Import Bank Act of 1945 was enacted as Public Law 79-173; approved July 31, 1945. Sec. 2(b)(1) has been amended and restated in 1972 (Public Law 92-126) and again in 1974 (Public Law 93-646). The language pertaining to "international terrorism, nuclear proliferation, ..." was added by sec. 1904 of the Export-Import Bank Act Amendments of 1978 (title XIX of the Financial Institutions Regulatory and Interest Rate Control Act of 1978; Public Law 95-630; approved November 10, 1978.

Section 2(b)(4) (12 U.S.C. 635(b)(4)) provides that the Secretary of State can determine, and report to Congress and to the Export-Import Bank Directors, if:

- any country has agreed to IAEA nuclear safeguards but has materially violated, abrogated, or terminated such safeguards after October 26, 1977;

- any country has entered into a cooperation agreement with the United States concerning the use of civil nuclear energy, but has violated, abrogated, or terminated any guarantee or other undertaking related to that agreement after October 26, 1977;

- any country has detonated a nuclear explosive device after October 26, 1977, but is a not a nuclear-weapon state;

- any country willfully aids or abets, after June 29, 1994, any non-nuclear-weapon state to acquire a

nuclear explosive device or to acquire unsafeguarded special nuclear material; or

- any person knowingly aids or abets, after September 23, 1996, any non-nuclear-weapon state to acquire a nuclear explosive device or to acquire unsafeguarded special nuclear material.

If such a determination is made relating to a person, the Secretary is urged to consult with that person's government to curtail that person's activities. Consultations are allowed 90 days, at the end of which the Secretary will report to Congress as to their progress. After the 90 days, unless the Secretary requests an additional 90 days, or unless the Secretary reports that the violations have ceased, the Ex-Im Bank will not approve any transactions to support U.S. exports to any country, or to or by any person, for which/whom a determination has been made. The imposition of sanctions may also be waived if the President, 45 days before any transaction is approved, certifies that the violations have ceased, and that steps have been taken to ensure the questionable transactions will not resume. The President may also waive the imposition of sanction if he certifies that to impose them would have a serious adverse effect on vital U.S. interests, or if he certifies that objectionable behavior has ceased.

Sec. 2(b)(4) was added by sec. 3(b) of Public Law 95-143; approved October 26, 1977. Sec. 825 of the Nuclear Proliferation Prevention Act of 1994 (title VIII of the Foreign Relations Authorization Act, Fiscal Years 1994 and 1995; Public Law 103-236; approved April 30, 1994) added "(as defined in section 830(4) of the Nuclear Proliferation Prevention Act of 1994), or that any country has willfully aided or abetted any non-nuclear-weapons state (as defined in section 830(5) of that Act) to acquire any such nuclear explosive device or to acquire unsafeguarded special nuclear material (as defined in section 830(8) of that Act)." to define "nuclear explosive device" and to broaden what acts are sanctionable. This is referred to as a "Glenn Amendment." The section was further amended and restated by sec. 1303 of the National Defense Authorization Act for Fiscal Year 1997 (Public Law 104-201; approved September 23, 1996). Sec. 1303(b) of that Act further required the President to report to Congress within 180 days "his recommendations on ways to make the laws of the United States more effective in controlling and preventing the proliferation of weapons of mass destruction and missiles. The report shall identify all sources of Government funds used for such nonproliferation activities."

Section 2(b)(12) (12 U.S.C. 635(b)(12)) requires the President to notify the Export-Import Bank if he determines "that the military or Government of the Russian Federation has transferred or delivered to the People's Republic of China an SS-N-22 missile system and that the transfer or delivery represents a significant and imminent threat to the security of the United States... Upon receipt of the notice and if so directed by the President of the United States, the Board of Directors of the Bank shall not give approval to guarantee, insure, extend credit, or participate in the extension of credit in connection with the purchase of any good or service by the military or Government of the Russian Federation."

Sec. 12 of the Export-Import Bank Reauthorization Act of 1997 (pending signing into law; cleared for White House on November 9, 1997) added paragraph 12.

Foreign Assistance Act of 1961 *(LFR '96, vol. 1-A, p. 13)*

The Foreign Assistance Act of 1961 (FAA) authorizes U.S. Government foreign aid programs including development assistance, economic support funding, numerous multilateral programs, housing and other credit guaranty programs, Overseas Private Investment Corporation, international organizations, debt-for-nature exchanges, international narcotics control, international disaster assistance, development funding for Africa, assistance to states of the former Soviet Union, military assistance, international military education and training, peacekeeping, antiterrorism, and various regional enterprise funds.

Section 620A (22 U.S.C. 2371), prohibits any foreign assistance, food assistance, Peace Corps funding, and support under the Export-Import Bank Act of 1945 from being made available to countries that the Secretary of State has certified as supporters of international terrorism (the 6(j) list). The restriction remains in place until such time that the Secretary certifies that there has been a fundamental change in the leadership and policies of the targeted country, the country is no longer supporting international terrorists, and that the targeted government has assured no such support will resume.

The President may waive the prohibition on the basis of U.S. national security, and some assistance may be restored to address humanitarian concerns. A waiver requires notification and justification being provided to Congress 15 days before assistance is given.

Section 620A was added by sec. 303 of the International security Assistance and Arms Export Control Act of 1976 (Public Law 94-329; approved June 30, 1976). The section has been amended and restated since then by sec. 503(a) of the International Security Assistance and Development Cooperation Act of 1985 (Public Law 99-83; approved August 8, 1985) and sec. 5 of the Anti-Terrorism and Arms Export Amendments Act of 1989 (Public Law 101-222; approved December 12, 1989).

Section 620E (22 U.S.C. 2375), related to U.S. assistance to Pakistan, was enacted in reaction to the threat posed by Soviet occupation of neighboring Afghanistan. **Section 620E(d)** authorizes the President to waive sanctions under section 101 of the AECA to provide assistance to Pakistan, if he determines it is in the U.S. national interest to do so.

Subsection 620E(e) states that no military assistance shall be furnished and no military equipment or technology shall be sold or transferred to Pakistan unless the President certifies to the Speaker of the House and the Chairman of the Senate Foreign Relations Committee that, for the fiscal year in which the assistance, sale or transfer would occur, Pakistan does not possess a nuclear explosive device and that proposed military assistance would significantly reduce the risk that Pakistan will possess a nuclear explosive device. This restriction does not apply to international narcotics control assistance, International Military Education and Training funds, funding for humanitarian and civic assistance projects, peacekeeping or other multilateral operations funds, or antiterrorism assistance.

Enacted as Public Law 87-195; approved September 4, 1961. Sec. 620E was added to the Foreign Assistance Act by sec. 736 of the International Security and Development Cooperation Act of 1981 (Public Law 97-113; approved December 29, 1981. Sec. 620E(d) was amended in 1994 by the Nuclear Proliferation Prevention Act of 1994 to reflect the repeal of secs. 669 and 670 and the enactment of sec. 101 of the Arms Export Control Act. Sec. 620E(e), the "Pressler amendment," was added by sec. 902 of the International Security and Development Cooperation Act of 1985 (Public Law 99-83; approved August 8, 1985). Sec. 559(a)(1)(D) of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1996 (Public Law 104-107; approved February 12, 1996), amended the section to exclude certain assistance programs from the ban, as noted in the last sentence, above. The same Act made several changes to restrict only "military assistance," formerly the section had referred to assistance generally. The same Act amended the section to authorize the President to: release Pakistan from paying storage costs of items purchased before October 1, 1990, but not delivered (presumably F-16s); release other items serviced in the United States; and continued the applicability of other laws pertaining to ballistic missile sanctions.

Section 620G (22 U.S.C. 2377) requires the President to withhold all foreign assistance to the government of any country that provides assistance to the government of a country listed as a terrorist state by the Secretary of State pursuant to sec. 620A of this Act (22 U.S.C. 2370).

The President may waive the imposition of the sanction if he determines that furnishing such assistance is important to the U.S. national interest and notifies the appropriate congressional committees of his intent 15 days prior to lifting the ban. His notification shall include the determination, a detailed explanation of the assistance to be provided with its estimated dollar amount, and an explanation of how such assistance furthers U.S. national interests.

Section 620G was added by sec. 325 of the Antiterrorism and Effective Death Penalty Act of 1996 (Public Law 104-132; approved April 24, 1996).

Section 620H (22 U.S.C. 2378) requires the President to withhold all foreign assistance to the government of any country that provides lethal military equipment to a country listed by the Secretary of State as a supporter of international terrorism (the sec. 6(j) list, maintained pursuant to sec. 6(j) of the Export Administration Act). The prohibition remains in place until one year after such transfers or transactions cease. The section is not retroactive, but includes all contracts entered into after the date of enactment (April 24, 1996).

The President may waive the imposition of the sanction if he determines that furnishing such assistance is important to the U.S. national interest and notifies the appropriate congressional committees of his intent 15 days prior to lifting the ban. His notification shall include the determination, a detailed explanation of the assistance to be provided with its estimated dollar amount, and an explanation of how such assistance furthers U.S. national interests.

Section 620H was added by sec. 326 of the Antiterrorism and Effective Death Penalty Act of 1996 (Public Law 104-132; approved April 14, 1996).

International Emergency Economic Powers Act (50 U.S.C. 1701 *et seq.*) *(LFR '96, vol. III, p. 1144)*

Section 203 (50 U.S.C. 1701 note) authorizes the President to deal with unusual and extraordinary threats with respect to a declared national emergency. He may investigate, regulate, or prohibit foreign exchange transactions, credit transfers or payments, currency or security transfers, and may take specified actions relating to property in which a foreign country or person has interest.

Enacted as title II of Public Law 95-223; approved December 28, 1977, to update and continue authority carried earlier in the Trading With the Enemy Act (Public Law 65-92; approved October 6, 1917). It has been amended from time to time to update the list of what cannot be restricted, mostly to keep up with changes in technology (for example, the law allows the free flow of informational materials, most recently amended to include CD ROMs).

Iran-Iraq Arms Nonproliferation Act of 1992 (50 U.S.C. 1701 note) *(LFR '96, vol. II, p. 1389)*

Section 1604 requires the President to impose sanctions against any person whom he has determined to be engaged in transferring goods or technology so as to contribute knowingly and materially to the efforts by Iran or Iraq to acquire chemical, biological, nuclear, or destabilizing numbers and types of advanced conventional weapons. **Section 1605** similarly addresses activities of foreign governments.

In both cases, mandatory sanctions prohibit, for a period of two years, the U.S. Government from entering into procurement agreements with, or issuing licenses for exporting to or for the sanctioned person or country. Where a foreign country is found to be in violation of the law, the President must suspend U.S. assistance; instruct U.S. Executive Directors in the international financial institutions to oppose multilateral development

bank assistance; suspend codevelopment and coproduction projects the U.S. Government might have with the offending country for one year; suspend, also for one year, most technical exchange agreements involving military and dual-use technology; and prohibit the exportation of U.S. Munitions List items for one year. In the case of foreign countries targeted for sanctions under this Act, the President may, at his discretion, use authority granted him under the International Emergency Economic Powers Act to further prohibit transactions with the country.

The President may waive the mandatory sanctions against persons or foreign country with 15 days notice to congressional committees that exercising such a waiver is essential to U.S. national interests.

Section 1603 makes sanctions in Section 586G(a)(1) through (4) of the Iran Sanctions Act of 1990 also fully applicable against Iraq (see below).

Enacted as title XVI of the National Defense Authorization Act for Fiscal Year 1993 (Public Law 102-484; approved October 23, 1992). Sec. 1408(a) of Public Law 104-106 (110 Stat. 494) amended sections 1604 and 1605 to apply not just to conventional weapons but also to chemical, biological, or nuclear weapons.

Iraq Sanctions Act of 1990 *(LFR '96, vol. I-B, p. 26)*

This Act reaffirmed the United States' commitment to sanctions leveled by the United Nations after Iraq invaded Kuwait in August 1990. The findings, laid out in **Section 586F**, cite Iraq's violation of international law relating to chemical and biological warfare, Iraq's use of chemical weapons against Iran and its own Kurdish population, efforts to expand its chemical weapons capabilities, evidence of biological weapons development, and its efforts to establish a nuclear arsenal.

The Act, **Section 586C**, continues sanctions imposed pursuant to four executive orders issued at the outset of Iraq's invasion of Kuwait. Sanctions include foreign assistance, trade, economic restrictions, and the freezing of Iraqi assets under U.S. jurisdiction. The President may alter or terminate the sanctions issued in his executive orders only with prior 15-day notification to Congress.

Section 586D prohibits foreign assistance, Overseas Private Investment Corporation (OPIC) funding, and assistance or sales under the AECA to countries found to be not in compliance with United Nations Security Council sanctions against Iraq. The President may waive these sanctions if he determines and certifies to Congress that assistance is in U.S. national interest, that assistance will benefit the targeted country's needy, or such assistance will be in the form of humanitarian assistance for foreign nationals fleeing Iraq and Kuwait.

Section 586G prohibits the United States from engaging in the following activities relating to Iraq: (1) U.S. foreign military sales under the AECA; (2) commercial arms sales licensing of items on the U.S. Munitions List; (3) exports of control list goods and technology, as defined by secs. 4(b) and 5(c)(1) of the Export Administration Act; (4) issuance of licenses or other authorizations relating to nuclear equipment, materials, and technology; (5) international financial institutions support; (6) Export-Import Bank funding; (7) Commodity Credit Corporation funding; and (8) foreign assistance other than emergency medical or humanitarian funding.

Pursuant to **Section 586H**, the President may waive the application of sec. 586G sanctions if he certifies to Congress that the Government of Iraq has demonstrated improved respect for human rights, does not support international terrorists, and "is not acquiring, developing, or manufacturing (i) ballistic missiles, (ii) chemical, biological, or nuclear weapons, or (iii) components for such weapons; has forsworn the first use of such weapons; and is taking substantial and verifiable steps to destroy or otherwise dispose of any such missiles and

weapons its possesses..." The President must further certify that Iraq is meeting its obligations under several international agreements. Finally, the President must certify that it is in the national interest of the United States to make such a waiver and resume any or all of these economic supports. The section also authorizes the President to waive the restrictions in response to a fundamental change in Iraq's leadership, provided the new government makes credible assurances that it meets the above criteria.

Section 586I prohibits the export licensing of supercomputers to any government (or its officials) that the President finds to be assisting Iraq in improving its rocket technology, or chemical, biological, or nuclear weapons capability. While the section includes no waiver authority, it is triggered by the President making a determination and so its implementation rests with the executive branch.

Enacted as secs. 586-586J of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 1991 (Public Law 101-513; approved November 5, 1990). It has not been amended.

National Emergencies Act *(LFR '96, vol. III, p. 1150)*

Title II (50 U.S.C. 1621, 1622) authorizes the President to declare, administer, and terminate national emergencies. Such a condition is required for the President to exercise his authority under the International Emergency Economic Powers Act.

Public Law 94-412; approved September 14, 1976. No substantive amendments relevant to proliferation issues.

National Security Act of 1947 *(new amendment)*

Sections 901 through 904 (50 U.S.C. 441, 441a-441c) allows the President to stay the imposition of economic, cultural, diplomatic or other sanctions when he determines and reports to Congress that to proceed without delay would seriously risk the compromise of an ongoing criminal investigation or intelligence source or method.

Sections 901 through 904 were added by sec. 303 of the Intelligence Authorization Act for Fiscal Year 1996 (Public Law 104-93; approved January 6, 1996.

Nuclear Non-Proliferation Act of 1978 *(LFR '96, vol. II, p. 1417)*

The Nuclear Non-Proliferation Act of 1978 states U.S. policy for actively pursuing more effective international controls over the transfer and use of nuclear materials, equipment, and technology for peaceful purposes in order to prevent proliferation. The policy statement includes the establishment of common international sanctions. The Act promotes the establishment of a framework for international cooperation for developing peaceful uses of nuclear energy, authorizes the U.S. Government to license exports of nuclear fuel and reactors to countries that adhere to nuclear non-proliferation policies, provides incentives for countries to joint international cooperative efforts in nuclear non-proliferation, and authorizes relevant export controls. The Act requires the Nuclear Regulatory Commission to publish regulations establishing procedures for granting, suspending, revoking or amending nuclear export licenses. The Act also requires the Department of Commerce to issue regulations relating to all export items that could be of significance for nuclear explosive purposes.

Section 304(b) (42 U.S.C. 2155a) requires the Nuclear Regulatory Commission to publish regulations establishing the procedures for granting, suspending, revoking or amending nuclear export licenses. **Section 309 (42 U.S.C. 2139a)** similarly requires the Department of Commerce to issue regulations relating to all export

items that could be of significance for nuclear explosive purposes.

Section 402 (42 U.S.C. 2153a) provides that, unless otherwise stated in a cooperation agreement, no source or special nuclear material exported from the United States may be enriched after exportation unless the United States approves the enrichment. The section prohibits the export of nuclear material for the purpose of enrichment or reactor fueling if the recipient country is party to a cooperation agreement with the United States amended or concluded after 1978, unless the agreement specifically allows for such transfers. Finally, the section prohibits export of any major critical component of any uranium enrichment, nuclear fuel reprocessing, or heavy water production facility, unless a cooperation agreement specifically designates these items as exportable.

The Nuclear Non-Proliferation Act of 1978 was enacted as Public Law 95-242; approved March 10, 1978. Secs. 304(b) and 402 have not been amended. Minor changes have been incorporated into sec. 309, relating to a requirement of prior consultation.

Nuclear Proliferation Prevention Act of 1994 *(LFR '96, vol. II, p. 1356)*

The Nuclear Proliferation Prevention Act of 1994 was enacted to update current law to reflect growing concerns about nuclear proliferation.

Section 821 (22 U.S.C. 3201 note) requires U.S. Government procurement sanctions against any U.S. person or foreign person if the President determines that that person has materially, and with requisite knowledge, contributed, through export of goods or technology, to efforts to acquire unsafeguarded special nuclear material, or to use, develop, produce, stockpile, or otherwise acquire a nuclear explosive device. Terms of the sanctions are that the U.S. Government may not, for 12 months, procure from or enter into procurement contracts with the sanctioned individual. Sanctions may be terminated after 12 months if the President determines and certifies to Congress that the individual has stopped whatever activities that brought on the sanctions, and that the individual will not engage in such activities in the future. Otherwise, to waive the sanctions at the end of 12 months, the President must determine and certify to Congress, 20 days in advance, that continuing the sanctions would have a serious adverse effect on vital U.S. interests.

The President is not required to apply or maintain sanctions if the articles or services provided are essential to U.S. national security; if the provider is a sole source; if the articles or services are essential to national security under defense cooperative agreements; if the articles are essential spare parts, essential component parts, routine servicing or maintenance, or information and technology essential to U.S. production. Sanctions may also not be required if the individual relied on an advisory opinion of the State Department stating that a particular activity was not deemed to be sanctionable.

In the case of a foreign person, the President is required to enter into consultation with the foreign government with primary jurisdiction over that person, and thus may delay the imposition of sanction for up to 90 days. Sanctions may be further averted if the President determines and certifies that the foreign government has taken steps to end the foreign person's activities.

Section 823 (22 U.S.C. 3201 note) requires the Secretary of the Treasury to instruct U.S. executive directors of international financial institutions to use voice and vote to oppose promotion of the acquisition of unsafeguarded special nuclear material or the development, stockpiling, or use of nuclear explosive devices by any non-nuclear-weapon state.

Section 824 (22 U.S.C. 3201 note) prohibits financial institutions and persons involved with financial insti-

tutions from assisting nuclear proliferation through the provision of financing. The section requires that when the President determines that a U.S. person or foreign person has engaged in a prohibited activity, he shall impose the following sanctions: (1) ban on dealing in U.S. Government debt instruments; (2) ban on serving as a depositary for U.S. Government funds; (3) ban on pursuing, directly or indirectly, new commerce in the United States; and (4) ban on conducting business from a new location in the United States.

The President is required to consult with any foreign government that serves as primary jurisdiction for any foreign person sanctioned under this section. Sanctions may be delayed for 90 days while consultation with a foreign government is underway, and may be further averted if the foreign government takes steps to stop the prohibited activity.

Sanctions are in place for not less than 12 months, and are terminated then only if the President determines and certifies to Congress that the person's engagement in prohibited activity has ceased and will not resume. The President may waive the continued use of sanctions when he determines and certifies to Congress that continuing the restrictions would have a serious adverse effect on the safety and soundness of the domestic or international financial system or the domestic or international payments system.

The Nuclear Proliferation Prevention Act of 1994 was enacted as title VIII of the Foreign Relations Authorization Act, Fiscal Years 1994 and 1995 (Public Law 103-236; approved April 30, 1994). Sec. 157(b) of Public Law 104-164 (approved July 21, 1996) made changes to sec. 824, including striking out a requirement that any Presidential determination pursuant to subsec. (c) be reviewed by the courts.

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