



Chinese Arms Exports to Iran

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Chinese arms exports to Iran have caused considerable concern within the international community, particularly for the United States. In conjunction with the U.S.-China summit of October 1997, China apparently took a number of steps to curtail sensitive transfers to Iran as part of a broader, more positive trend in Chinese nonproliferation policy. But numerous concerns persist that China continues to provide Iran with systems and technologies that contribute to further development of its cruise and ballistic missile capability, as well as to its nuclear, chemical and biological weapons programs.

Within the international community, the United States has sustained the greatest degree of opposition to Chinese arms exports to Iran. Owing to its global security commitments, the United States is the world's most prominent and forceful advocate against the proliferation of advanced conventional and mass destruction weapons, especially to "countries of concern" that have clearly threatening agendas toward the United States and its friends and allies.

The United States views Iran with particular concern as a sponsor of international terrorism, a threat to vital U.S. security interests in the Persian Gulf region, as a threat to U.S. friends and in the Middle East, especially to Israel. U.S.-Iran relations are characterized by deep suspicions and animosities.

Suspicious and difficulties have likewise characterized U.S.-China relations

in recent years. Across a host of issues--trade, human rights, Taiwan, and nonproliferation--U. S. public opinion in the 1990s took a largely negative turn against China, especially after Beijing violently crushed the student-led pro- democracy demonstrations in spring 1989.

It is a matter of considerable debate whether U.S. pressure and attention has achieved positive results for U.S. nonproliferation policy, for stemming Iranian proliferant activities, for regional security, and for improved U.S.-China relations. It is clear that past actions by China and the probability of persistent sensitive transfers to Iran in the future leave open the door for realistic and continuing concerns.

Serious attention should be brought to bear on these concerns for several reasons. First, Iranian development and possible deployment of weapons of mass destruction is contrary to widely held international norms as codified in international agreements.

Second, an increasing military capability for Iran, based in part on its cooperation with China, may increase regional tensions and stability.

Third, China's arms trade with Iran has presented very serious obstacles to improved U.S.-China relations. Until China halts a broad range of troubling arms-related activities with Iran, the issue will continue to undermine the kind of respectful, constructive, and stable relations these two major powers should seek.

To assess the current and likely future scope and nature of the China-Iran arms trade, and how it affects larger international, regional, and bilateral security concerns, several important questions should be addressed:

--What are the broader strategic, political and economic motivations that drive Chinese arms trade with Iran? Have these factors changed over time in a way conducive to diminished Sino-Iranian arms trade in the future?

--What has been the extent and nature of Chinese arms trade with Iran? What actions have been taken by the United States in response? Has China taken meaningful steps to curtail its arms trade with Iran?

--Has the nature of this trade changed significantly over time? In what ways has this trade changed to make it more or less problematic for international and regional security concerns?

--What steps can be taken by the international community multilaterally, and by the United States in particular, to address their concerns about Chinese arms trade with Iran?

This study reaches the conclusion that, while China has taken a number of positive steps in recent years to curtail its export of sensitive weapons and technologies to Iran, more needs to be done to reduce exports to Iran (and elsewhere) and to ensure that China can meet the nonproliferation goals it has set for itself

PRE-1979 TIES

The governments of the Republic of China and Iran established diplomatic relations in 1922. At the time, Iran was the first country of West Asia to recognize the post-dynastic government in China. However, with the founding of the People's Republic of China (PRC) in 1949, diplomatic relations between the two countries were cut off. Relations soured

further when Iran joined with the majority in the United Nations in 1951 to condemn the PRC as an "aggressor" nation for its part in the Korean War. Iran joined the Baghdad Pact in 1955, and Beijing saw this as one more move in the U.S.-led policy of encirclement to contain the communist bloc.

With the collapse of the Sino-Soviet relationship in the 1960s, however, and with the increasing U.S. presence on China's border in Southeast Asia, China stepped up its diplomatic efforts to establish friendly relationships in the developing world. In early 1970, Iran abstained from voting on the resolution to admit the PRC to the United Nations-the first time it had not voted against admitting the PRC-and in August of that year the two countries established formal diplomatic relations. In severing official ties with the Republic of China on Taiwan, Iran recognized the PRC as "the sole legal Government of China."

Beijing increasingly saw Iran as a bulwark against Soviet expansionist aims toward the Persian Gulf, and favorably viewed the Shah's efforts to become, with U.S. assistance, the most powerful military force in Southwest Asia.

Sino-Iranian relations continued to be strong as late as 1978. In September 1978, Mao Zedong's hand-picked successor, Hua Guofeng, led a high-ranking delegation to Tehran, the last visit by a head of state to Tehran before the collapse of the Shah's rule.

ESTABLISHING TIES WITH THE ISLAMIC REPUBLIC

Diplomatic ties between China and Iran took some time to develop following the establishment of the Islamic Republic in March 1979. China had just launched its punitive war against Vietnam and was concerned about expanding Soviet influence in Southeast Asia. The new Iranian leadership was suspicious of countries such

as China that had close ties to the Shah. However, owing to China's abiding concerns about Soviet influence in Southwest Asia, China took steps to reestablish good relations with Iran.

The importance the Chinese placed on this relationship was demonstrated in the wake of the November 1979 seizure of U.S. diplomatic hostages in Tehran. In January 1980—a time of warming relations between the United States and China—China abstained in the United Nations Security Council vote to sanction Iran for the hostage-taking.

With the onset of the Iran-Iraq War in September 1980, China became one of Iran's closest international partners. For China, improved Sino-Iranian relations including arms sales served a range of strategic, political, and economic interests. While the leadership in Iran had dramatically changed, the strategic rationale for strong Sino-Iranian ties had not. Indeed, following the Soviet invasion of Afghanistan, China was even more concerned to strengthen ties with Iran.

Throughout the 1980s, diplomatic exchanges between the two countries intensified. During the year prior to the Iran-Iraq ceasefire in 1988, China acted as a go-between, hosting high-level delegations from Iran and Iraq in an effort to resolve differences between the two combatants.

The end of hostilities between Iran and Iraq in 1988 did not slow the steady development of the China-Iran relationship. Chinese arms exports to Iran continued, and moved beyond basic conventional weaponry to include cooperation in ballistic missiles, advanced cruise missiles, and possibly nuclear, chemical, and biological assistance.

DIMINISHING RATIONALE?

Contrary to widely held views, it is clear that Beijing's interest over the 1980s and early 1990s in building closer ties with Iran—including the provision of weapons—had

as much or more to do with strategic and political considerations as with profit-taking. Iran's revolutionary policies and strong stand against outside influence meshed well with China's policies during the 1980s of maintaining independence from the superpowers while building Chinese regional influence.

However, with the breathtaking shifts of the international environment in the early 1990s, much of the strategic rationale for strong Sino-Iranian ties changed. China's arms trade with Iran diminished, but China continues to provide Iran with sensitive weapons and technologies. These exports increasingly involve technology transfers, dual-use trade, and scientific assistance that are difficult to monitor. Such transactions may help Iran to develop a greater indigenous capacity to produce and deploy advanced conventional and mass destruction weapons.

CHINESE ARMS TRANSFERS TO IRAN

The Chinese arms trade with Iran has since the early 1980s involved conventional, missile, nuclear, and chemical weapons. With the exception of Pakistan and possibly North Korea, China's arms trade with Iran has been more quantitatively and qualitatively comprehensive and sustained than that with any other country. This trade has included the provision of thousands of tanks, armored personnel vehicles, and artillery pieces, several hundred surface-to-air, air-to-air, cruise, and ballistic missiles as well as thousands of antitank missiles, more than a hundred fighter aircraft, and dozens of small warships. In addition, it is widely believed that China has assisted Iran in the development of its ballistic and cruise missile production capability, and has provided Iran with technologies and assistance in the development of its

clandestine chemical and nuclear weapons programs.

Perhaps most importantly, China appears to have made significant contributions to Iran's indigenous military production capability through the provision of scientific expertise, technical cooperation, technology transfers, production technologies, blueprints, and dual-use transfers. Such transfers are difficult to monitor and assess, but will likely make up a far greater proportion of China's militarily relevant transfers to Iran in the future.

Unfortunately, it is difficult to fully verify the precise extent and nature of Chinese arms transfers to Iran. Open-source literature - which forms the basis of this study - while often extensive, has numerous drawbacks and requires exacting analysis and consideration. Most of the reporting on Chinese sales to Iran appears as part of U.S. or Western analyses. Open-source mainland Chinese materials on arms trade to Iran are virtually nonexistent, though it is possible to access mainland Chinese open sources to gain insights into Chinese weapon systems, military R&D and production programs and problems, attitudes toward nonproliferation regimes, and strategic viewpoints about the Persian Gulf and U.S.-China relations.

ANTISHIP CRUISE MISSILES

China's exports of antiship cruise missiles to Iran has caused substantial concern both in the United States and among Iran's neighbors in the Persian Gulf. In spite of these concerns, China continuously conducted cruise missile trade with Iran from the mid-1980s through the mid-1990s. Recently, China's reported sale of C-802 cruise missiles to Iran triggered a strong reaction in the United States, leading Congress to call for sanctions against China. In the lead-up to the October 1997 U. S.-China summit, China apparently agreed to halt sales of antiship cruise missiles to Iran.

HY-2 ("Silkworm") Missiles

During the Iran-Iraq War, one of China's most controversial arms transfers involved the HY-2 antiship missile, commonly referred to in the United States as the Silkworm. The first of several HY-2 shipments was delivered in the summer of 1986, and Iran successfully test-fired an HY-2 missile in February 1987. The vulnerability of U.S. naval vessels to antiship cruise missiles became especially clear when the U. S. S - Stark was attacked by an Iraqi-fired Exocet missile in May 1987. In October 1987, an American-owned tanker under the Liberian flag and a Kuwaiti tanker under the U.S. flag, the Sea Isle City, were hit by Silkworm missiles.

The United States reacted strongly to reports of the HY-2 sale. There were condemnations of China in U.S. news media, and the Reagan administration lodged a formal protest. China reacted by issuing a blanket denial, calling the allegation "groundless." When the United States confronted China with strong evidence that Iran possessed the HY-2 missile, Beijing claimed that these weapons had been supplied by North Korea. It was possible that a number of HY-2s were indeed imported from North Korea, which received the HY-2 and related technology from China in the 1970s and had indigenously produced the missile since the early 1980s. However, despite Chinese denials, U.S. intelligence sources gathered further evidence that a number of HY-2 missiles in Iran had been sold directly by China.

On 22 October 1987, the Reagan administration froze any further liberalization of technology sales to China. This was the first time the United States had acted against a third country for supplying weapons to Iran.

It is unclear if U.S. pressure had the desired effect. On the one hand, it did not

extract from China any kind of public admission that the HY-2 sale had ever taken place. Indeed, China's position remained publicly unchanged, despite overwhelming U.S. intelligence evidence.

On the other hand, there were some indications that Beijing took steps to curtail HY-2 sales to Iran after 1987, or at least privately informed U.S. officials that it would take such steps. In early March 1988 the U.S. State Department received a pledge from China that it would not sell antiship cruise missiles to Iran. As a result, in March 1988 the Reagan administration relaxed restrictions on the export of U.S. high technology to China.

Despite Beijing's assurances, China continued to sell Iran HY-2 missiles in 1988 and 1989. Furthermore, Iran claimed in early 1988 that it had developed the capability to manufacture HY-2s and other antiship cruise missiles indigenously.

Moreover, reports in the early 1940s indicated that China's assistance to Iran's HY-2 program was continuing. However, instead of direct transfers of complete weapons, it appeared that China was assisting Iran in improving its indigenous missile production capabilities. Some sources suggest that, with Chinese assistance, Iran could develop turbojet or ramjet variations on the HY-2 missile, which would give the weapon a longer range and greater accuracy. Nonproliferation and arms control specialists generally view this kind of assistance with even greater concern than the transfer of complete systems.

Recent estimates state that Iran fields approximately 100 HY-2 missiles on eight to ten mobile missile launchers on the north side of the Straits of Hormuz. The degree of threat posed by the Iranian HY-2s is a matter of debate. During the Iran-Iraq War, the HY-2 was considered by many in the region to be a serious threat to the vital oil commerce in the Persian Gulf. However, the HY-2 was not a state-of-the-art system even

in 1986. According to Stanley Weeks, a senior scientist at Science Applications International Corporation, "The Achilles' heel of that system is its size and slowness, so you can see it and have more time to react." However, great concern was triggered by unconfirmed intelligence reports in early 1992 that Iran was outfitting a variant of the HY-2 cruise missile with a nuclear war head.

C-801 Missiles

In addition to the HY-2, China also exported the C-801 antiship missile to Iran during the Iran-Iraq War. According to one source, Iran may have imported as many as 100 C-801s and eight launchers in 1987-88. Another source, from 1994, states that Iran at the time possessed about 200 C-801 missiles. China may also have provided Iran with the means and know-how to produce the C-801 indigenously, with the Iranian C-801 equivalent termed the Tondar. According to U.S. defense officials, in June 1997 Iran tested two Chinese-built C-801 air-launched cruise missiles from an F-4 fighter. This marked the first time that Iran had successfully test-fired air-launched missiles, a significant improvement in Iran's military capability.

C-802 Missiles

After the 1991 Gulf War, Iran embarked on a naval modernization program which included the import from China of the advanced C-802 antiship cruise missile. The C-802 at the time, and to the present day, is China's top-of-the-line antiship cruise missile (though China continues missile development of more advanced versions). By mid-1997, Iran reportedly possessed approximately sixty ship-launched C-802s. In addition, Iran deployed a number of coastal C-802 batteries on Qeshm Island, a strategic point on the eastern side of the Arabian peninsula.

Reports of the C-802 sale triggered a strong political reaction in the United States. As early as March 1996, U.S. Arms Control and Disarmament Agency (ACDA) director John Holum stated that the administration was considering imposing sanctions on China for the sale, which was alleged to violate the 1992 Iran-Iraq Arms Nonproliferation Act. This act, which is also known as the Gore-McCain Act, is targeted at countries that transfer destabilizing weapons, in quantitative and qualitative terms, to either Iran or Iraq. The Clinton administration eventually decided against imposing sanctions, reportedly because it concluded that the number and type of missiles transferred were not "destabilizing."

As was the case with the HY-2, the more long-term concern, from a nonproliferation and arms control perspective, may be the contribution China is making to Iran's ability to produce the C-802, or similar missiles, indigenously. Iran already produces a long-range coastal defense antiship cruise missile, reportedly derived from the C-801, or perhaps also the C-802. Moreover, in July 1996 Asian intelligence reports indicated that China was assisting Iran with two new antiship cruise missiles, called the Karus, which are also believed to be based on the C-801 and/or C-802. The same sources also state that Iran has begun indigenously producing a medium-range antiship missile, the FL-10, which is based on the Chinese FL-2 or FL7 and was developed with Chinese technical assistance.

Owing to these political and nonproliferation concerns, and with the U.S.-China summit on the near horizon, U.S. and Chinese negotiators apparently reached an agreement on China's sales of cruise missiles to Iran prior to the October 1997 meeting of Clinton and China's president Jiang Zemin. However, the scope and precise nature of the agreement remain uncertain. It appears likely that some forms

of Sino-Iranian cooperation on cruise missiles - technical assistance and training, production technologies, subcomponents--will continue.

BALLISTIC MISSILES

Like China's cruise missile sales, China's ballistic missile transfers to Iran have caused significant concern in the West, and particularly in the United States. While the primary concern with cruise missiles has been their implications for Iran's ability to control oil traffic in the Persian Gulf, or possibly to threaten U.S. naval vessels, the concern over ballistic missiles is based on their possible use in attacks on land-based targets, and particularly their possible use as delivery systems for weapons of mass destruction. Targets in the region could include U.S. bases or staging areas, population centers, and, perhaps over the long term, targets in Israel.

M-Series Medium-Range Ballistic Missiles

The Chinese M-9 and M-11 ballistic missiles were developed for export and most (though not all) of China's controversial ballistic missile sales and technology transfer agreements have involved one of these two missiles. However, available evidence suggests that while China and Iran may have discussed the transfer of complete M-9 or M-11 missiles, it is likely that China at most provided technical assistance in the development of such systems. In the case of another M-series missile - the M-7 - it appears somewhat more credible that China made direct transfers of complete missiles to Iran.

An agreement to transfer complete M-11 missiles from China to Iran may have been imminent in late 1991 and again in late 1992, but the deal was apparently canceled, modified, or postponed, probably due to U.S. pressure on China. In November 1991, shortly after China pledged that it would

abide by the guidelines of the Missile Technology Control Regime (MTCR), Secretary of State James Baker stated that the PRC had pledged to cancel proposed M-11 sales to both Pakistan and Iran, as well as M-9 sales to Syria. In October 1993, Defense News reported that China and Iran had signed a US\$5-billion M-11 deal that covered the transfer of 600 M-11 missiles. But Defense News did not indicate that any of these M-11s had been delivered. Presumably, the Chinese, in accordance with their MTCR commitments (but not necessarily motivated by them), did not provide complete M-11 missile systems to Iran.

Media reports about M-11 transfers to Iran have confused this missile with the M-7. The International Institute for Strategic Studies (IISS) 1994 report stated that Iran had received at least twenty M-7 missiles from China. A later IISS publication, *The Military Balance 1996/97*, estimates that Iran has 200 M-7s. However, it is not entirely clear whether Iran has directly imported all of its M-7s, or whether it has converted - possibly with Chinese assistance - some of the estimated 130 HQ-2 surface-to-air missiles it imported from China in the mid-1980s.

Since the M-7 is clearly a short-range missile, it is not covered by the MTCR, and its transfer, even if it had not been a secret, would not have been a violation of China's nonproliferation commitments.

The available evidence suggests that China has provided expertise, technology, and production equipment related to the M-9 and M-11 programs. As a result, Iran has developed and produced variants of these systems indigenously. As in the case of antiship cruise missiles, the transfer of expertise and production technology generally attracts less attention than the transfer of complete systems, but may have greater long-term significance for the military balance in the region.

China's most significant contribution to Iran in the area of missile expertise, training, and technology has been its assistance in the construction of missile production facilities. Iran's largest missile factory, located near Isfahan, was originally built in cooperation with North Korea, possibly with Chinese assistance. Although it is not entirely clear when China became directly involved with the Isfahan missile complex, reports of Chinese involvement surfaced in the late 1980s. Beginning in 1987-88, the Isfahan facility served as the assembly site for Iran's Scud-B missile kits, which were imported from North Korea.

Scud and Indigenous Missile Programs

Besides significant assistance to Iranian production of Chinese designed ballistic missiles, and possibly some transfers of complete systems or components, China has reportedly provided Iran with technical assistance for indigenous missile programs as well. In addition to production assistance at Isfahan, sources report that China has also helped build a ballistic missile plant and test range east of Tehran, and may also be involved in producing solid-fuel rockets at Iran's Semnan facility. China has allegedly provided other assistance, including guidance technologies and precision machine tools for Iran's indigenous ballistic missile programs.

In addition to possible indirect Chinese help with Iran's Scud program, a number of indigenous shorter-range Iranian missile and artillery rocket programs have probably benefitted from some level of Chinese assistance. Two such programs are the Oghab and Iran-130 artillery rockets. Iran is reported to have developed indigenously an extended range version of the Iran-130, the Mushak-160, which has a range of 160 kilometers, and is reportedly receiving Chinese assistance in the development of a 200-kilometer range, 500-

kilogram payload version, the Mushak 200. China and Iran are also reportedly developing a new short-range ballistic missile, the NP-110. This solid-fuel ballistic missile will have a range of approximately 105 miles and allegedly draws from Chinese assistance with rocket motors and advanced test equipment.

However, to date, the longest-range missile deployed by Iran is the Scud-C, with a range of between 500 and 550 kilometers. According to a report published by the Stockholm International Peace Research Institute (SIPRI), Iran originally wished to have long-range missiles in order to deter preemptive strikes from Israel. At present, Iran's plans for long-range missiles have been curtailed, according to the SIPRI study.

The most recent controversies concerning Chinese technology transfers to Iran's indigenous ballistic missile programs concerned the alleged transfers of numerous missile-related technologies, including sensitive gyroscopes, other advanced guidance system technology, solid fuel technology, and computerized machine tools. Reports suggest that the solid-fuel, gyroscope, and guidance technology will be used in Iran's Zelzal-3 missile, which is currently under development. The Zelzal-3 is a solid-fuel missile with 1000-1500 kilometer range.

NUCLEAR TRADE AND COOPERATION

China's nuclear trade with Iran has been a complicated but serious irritant in U.S. -China relations. The United States has strongly urged China in the past to halt ongoing nuclear cooperation with Iran, arguing that virtually any form of nuclear assistance would contribute to the development of Iran's clandestine nuclear weapons program. China and Iran, for their parts, have since 1992 argued that Chinese transfers of nuclear assistance are fully

legal, consistent with the provisions of Article 4 of the Nuclear Nonproliferation Treaty (NPT), which allows for peaceful nuclear cooperation, and that Iranian nuclear facilities are under safeguards of the International Atomic Energy Agency (IAEA). To date, based on its full-scope safeguards agreement with Iran, the IAEA finds that Iran is in full compliance with its obligations as an NPT member not to develop nuclear weapons.

However, the United States has strongly persisted with China, steadily gaining ground to bring Sino-Iranian nuclear cooperation to an end. Most importantly, as part of the negotiations running up to the U.S.-China summit of October 1997, Washington sought and received written assurances from China that it would halt all new nuclear assistance to Iran. This was one price China had to pay so that the U.S.-China Peaceful Nuclear Cooperation Agreement of 1985 would go forward. Nonetheless, prior to this agreement, China provided Iran with a range of nuclear-related assistance, including alleged cooperation in uranium mining, uranium enrichment and conversion technologies, research reactors, production facility blueprints, and technical training and assistance.

Nuclear Research Projects

China's nuclear cooperation with Iran probably began in the mid-1980s. In 1985, China and Iran signed an agreement on reactors and reactor sites that the Chinese government did not officially acknowledge. It is generally believed that most of China's nuclear-related assistance to Iran in this early period involved the Isfahan nuclear complex, located in central Iran. The Isfahan facility began operations in 1984, but was not declared a nuclear facility until after a 1992 inspection by the IAEA.

China allegedly began assisting operations at Iran's Isfahan nuclear research center shortly after it began operation. In

1985, the PRC may have supplied two subcritical training reactors" to the site (a 27 kilowatt miniature neutron source reactor and a heavy water zero power reactor). In addition, some fifteen nuclear engineers from the Isfahan center were trained in China between 1988 and 1992, and in the late 1980s China is believed to have sold Iran a small electromagnetic separator called a calutron (used in uranium enrichment) for use at the Isfahan facility. In 1991, it was reported that China and Iran had struck a deal under which China would sell a research reactor (20-30 megawatts) to Iran, to be located at the Isfahan site. Both the calutron and the research reactors present proliferation concerns since they could be used for a nuclear weapons program, according to the U.S. Department of Defense.

Prior to 1991, China labeled all reports of nuclear cooperation with Iran as "groundless" and "preposterous," stating that "China has struck no nuclear deals with Iran." China finally dropped its blanket denial of Sino-Iranian nuclear cooperation in November 1991, when the Chinese Foreign Ministry admitted that Chinese and Iranian companies had signed contracts for the Chinese sale of the calutron and the miniresearch reactor in 1989 and 1991, respectively. But the Chinese Foreign Ministry insisted that these items could be used only for peaceful purposes, such as medical diagnosis and physics research, and that the facilities would be under IAEA safeguards. The Chinese side further argued that the proposed 20 megawatt research reactor was too small to pose a proliferation threat.

The 1992 IAEA inspection generally concurred with the China-Iran position on the Isfahan project. The IAEA found that the calutron at Isfahan did not appear to be part of a nuclear weapons program, and was too small to be used for uranium enrichment. The IAEA also did not consider the

proposed 20-megawatt research reactor project large enough to produce significant amounts of weapons-grade nuclear material.

Many in the United States were skeptical, and feared that the proposed research reactor could be used to create fuel for nuclear weapons. U.S. experts believe that the reactor would be able to produce up to six kilograms of plutonium per year. Although the IAEA does not consider this amount significant, it is enough to manufacture one nuclear bomb. Because the United States believes that Iran is pursuing a clandestine nuclear weapons program, even this small amount of weapons-grade material was enough to get Washington to pressure China to cancel the 20 megawatt reactor deal. Although the reactor project was reportedly already under way in the fall of 1992, China canceled the deal in October 1992, citing "technical reasons.

The termination of the 20-megawatt reactor deal did not stop Sino-Iranian cooperation on small-scale nuclear research and technology projects. In February 1993 China and Iran signed an agreement under which the PRC would provide Tehran with an HT-6B Tokamak nuclear fusion reactor, to be located at Azad University in Tehran. In 1994, Chinese technical teams made two trips to Tehran to install, test, and fine-tune the reactor, and in February 1995 Iran informed China that the reactor had successfully produced a 20 millisecond electromagnetic discharge.

Nuclear Power Reactors

At the same time that Washington was pressing Beijing to scrap the 20-megawatt research reactor deal, China and Iran were negotiating an even larger sale of two 300-megawatt pressurized water reactors. China and Iran signed a nuclear energy cooperation agreement during Iranian president Rafsanjani's visit to Beijing. This agreement cleared the way for

the sale of the 300-megawatt reactors, as well as other nuclear technology.

The 300-megawatt reactor sale was not a clandestine arrangement. China and Iran both insisted, repeatedly and publicly, that the reactors would be used only for peaceful purposes and would be subject to IAEA safeguards. However, U.S. government and military officials were concerned that the reactors in question could be used to support what the U.S. views as a clandestine nuclear weapons program in Iran. Specifically, the transfer of the reactor and associated technology would include the equipment to manufacture nuclear fuel rods, which could be used to generate fissile material for nuclear warheads.

Therefore, the United States objected strongly to the 1992 China-Iran nuclear cooperation agreement, and administration officials publicly advised China that the sale of 300-megawatt reactors to Iran would be "highly imprudent and should be avoided." Washington's objections did not have the desired effect, however. Iranian officials condemned the United States for issuing such a statement, and Beijing publicly rejected the U.S. appeal.

Some U.S. experts were less concerned about the reactor sale, since they did not believe China would be able to complete the reactors by 2002, the scheduled start-up date. When China constructed its Qinshan-1 reactor in the late 1980s, the PRC had to obtain key reactor components, including cooling pumps, steam generator tubing, instrumentation and control systems, and pressure vessels, from Germany, Japan, and other foreign suppliers. These suppliers have declared that they will not sell similar nuclear technology to Iran and, without foreign assistance, China's ability to complete the plants on schedule, or perhaps to complete them at all, is questionable. The PRC claims that it will be able to produce all of these components indigenously by the time of the reactor's

proposed start-up date, but many Western experts are still skeptical.

On 27 September 1995, Chinese foreign minister Qian Qichen told U.S. secretary of state Warren Christopher that China had unilaterally decided to cancel the sale of the two 300-megawatt power reactors to Iran. The reasons for the cancellation are unclear. U.S. pressure may have played a significant role in China's decision.

Uranium Conversion and Enrichment Facilities

Another area of possible nuclear cooperation between China and Iran has been in uranium conversion and enrichment. As early as June 1994, reports indicated that Chinese nuclear experts were assisting with the construction of uranium enrichment plants at Rudan and Shiraz, including a Chinese-constructed uranium hexafluoride (UF₆) plant.

Although enriched uranium has civilian applications, Iran's desire to construct its own plants was taken by U.S. analysts to be a sign that Iran intends to use the enriched uranium in its clandestine nuclear weapons program. Iran could purchase enriched uranium for its civilian reactors on the international market for a fraction of the cost of developing an indigenous uranium enrichment capability.

In September 1995, China's ambassador to Iran conceded that China was selling uranium enrichment technology and other nuclear technology to Iran. In early 1996, China informed the IAEA of the proposed sale of a uranium conversion facility to Iran, and stated that it planned to go ahead with the sale under appropriate IAEA safeguards. Washington, however, continued to press China to scrap the sale entirely. The plant was reportedly close to completion by early 1997, and was scheduled to become operational in 2000. But with the agreement reached between the United States and China in October 1997 to

halt Chinese nuclear assistance to Iran, it would appear that the UF6 conversion plant project will not be completed with Chinese help. Nevertheless, reports indicate that China did agree to provide Iran with the blueprints necessary for them to continue construction of the UF6 conversion plant.

Cutting Off Nuclear Trade with Iran

A year to eighteen months prior to the planned U.S.-China summit of October 1997, it became clear to U.S. negotiators that China would need to take several steps if the proposed certification of the 1985 U.S.-China Peaceful Nuclear Cooperation Agreement were to go forward. The presidential certification that China was not assisting other countries' nuclear weapons programs would allow for U.S. companies to initiate civil nuclear trade with China, a market estimated to range between 15 and 50 billion over the course of the next two decades. In 1996 and 1997, U.S. officials worked with China to gain several critical agreements that would smooth a presidential certification of the 1985 nuclear accord and help assure improved U.S.-China relations overall.

First, Washington wanted China to establish public regulations on nuclear exports that were comprehensive, nationwide, included dual-use items, and were "catch-all." In September 1997, under U.S. pressure, these regulations were formally approved and publicly announced in China.

Second, the United States wanted to see China Join the Zangger Committee, a group of nuclear suppliers who work together to harmonize nuclear export controls and abide by a specific list of nuclear technologies and equipment which should be subject to careful monitoring and controls. China sat in as an observer to the May 1997 meeting of the Zangger Committee, and formally joined as a full member in October 1997.

Third, the United States wanted China to strictly adhere to its May 1996 pledge not to provide nuclear assistance to unsafeguarded nuclear facilities. According to the U.S. Arms Control and Disarmament Agency in summer 1997, "current information does not provide a basis for concluding that China has acted inconsistently with that statement."

Finally, U.S. negotiators sought written assurances from China that it would not provide nuclear-related assistance to Iran. This was a major concession needed to allow the 1985 U.S.-China Peaceful Nuclear Cooperation Agreement to go forward.

During the U.S.-China summit in October 1997-on the day of the actual formal meeting between the two presidents-"authoritative, written communications" were provided confidentially to the United States by China stating that China would provide no new nuclear assistance to Iran. Under the agreement, China would be allowed to complete two existing projects which are not of proliferation concern to the United States: the construction of a zero power research reactor that uses natural uranium and heavy water and a zirconium cladding production factory. Following completion of these, projects, which is expected in a relatively short period, China apparently is not to provide new, follow on assistance to them. Specifically, the two sides agreed that China would not provide the power reactors and UF6 conversion plant which were under discussion.

With these assurances, the Clinton administration went forward to certify the 1985 U.S.China Peaceful Nuclear Cooperation Agreement. U.S. officials noted that future nuclear trade with China would be reviewed on a case-by-case basis, and that Chinese actions inconsistent with its nonproliferation commitments would result in a suspension or termination of the nuclear cooperation agreement.

CHEMICAL- AND BIOLOGICAL-RELATED TRANSFERS

Chemical Weapons

Iran began its pursuit of an offensive chemical weapons capability in the early 1980s, in response to mustard gas attacks on Iranian troops by the Iraqis. Iraqi attacks against Iran caused approximately 50,000 casualties. According to the U.S. Department of Defense, Iran was able to deliver chemical agents against enemy troops by 1987, and has now produced hundreds of tons of blister, blood, and choking agents.

China's contribution to this program is difficult to trace precisely from open sources. As an original signatory to the Chemical Weapons Convention (CWC) in January 1993, and having ratified the treaty and joined its governing body as a founding member in 1997, China is under the strictest obligations not to assist countries in the development of chemical weapons. Iran, too, has signed and ratified the CWC, and is under an international obligation not to develop chemical weapons. China is not a member of the Australia Group, a multilateral body of states that aims to discourage and impede chemical and biological weapons (CBW) proliferation by harmonizing national export controls on CBW precursors. The United States invited China to join the Australia Group in May 1997, but the offer was declined.

Negotiations with the Chinese over the past several years, and leading up to the U.S.-China summit of October 1997, have not had the same kind of success in relation to chemical proliferation as they have apparently had with nuclear-related exports. China has an enormous chemical industry but lacks adequate means to monitor and enforce export controls on the industry. Moreover, the dual-use nature of many chemical-related exports makes the task of policing chemical weapons-related transfer

difficult, even for countries with greater export control experience. Chinese exports of potentially troublesome chemical agents and technologies are likely to continue though it appears the Chinese government is determined to closely monitor and prevent such export. Iran ratified the CWC in October 1997 and was required to submit within thirty days of ratification a declaration describing the chemical weapons and production facilities it may possess. That declaration and the possibility of intrusive challenge inspections allowed under the convention may result in some embarrassing revelations for the Chinese. That alone may compel the Chinese government to improve its controls on chemical weapons-related and dual-use chemical exports.

Biological Weapons

Similar serious concerns have been raised with regard to Chinese shipments of biological weapons-related transfers to Iran. As in the case of chemical weapons, Iran began to seriously consider the biological weapons option in the early 1980s, during the war with Iraq. The CIA has reported that Iran holds stocks of biological agents and weapons, and there are a number of cases in which Iranian entities linked to military agencies have sought to procure equipment and commodities with the potential for biological weapons production. However, the open-source evidence provides only limited substantiation of an Iranian biological weapons program. Chinese involvement in that program, if any, is even more difficult to verify from open sources.

Since 1984 China has been a member of the Biological Weapons Convention (BWC), a 1972 agreement in which signatories agree not to develop, produce, stockpile, or acquire biological agents or toxins. However, the BWC at present does not contain enforcement and

verification provisions such as those in the NPT or CWC.

Concerns about Chinese biological weapons exports derive in part from the belief that China itself has such a capability. According to a U.S. intelligence official, China recently sold Iran dual-use equipment and vaccines with both civilian medical applications and biological weapons applications. This report points to some of the problems inherent in tracking biological transfers for weapons use: the dual-use nature of most biological research and production activities mean that they can be relatively easily turned over to weapons use, making it often very difficult to differentiate between legitimate and military end-uses.

ENCOURAGING PROGRESS

Chinese trade with Iran in as well as nuclear, chemical biological systems and tech is and should be of continuing and focused concern in the arms control and nonproliferation community, as well as in the United States. At the same time, should not lose sight of tt. encouraging steps China I particularly over the past 1 five years, to stem the flow of sensitive weapons and technology to Iran.

The key to assuring tho developments continue w' clearly identify the cause and source of possible breaches of Chinese nonproliferation commitments, and to work with the Chinese as well as with the international community to steadily tighten China's ability to comply with the nonproliferation goals it has set for itself In short, it is a question of closing the gap between Chinese policy and Chinese practice. Given the degree of concern with Iran, this process should focus to a large degree on Chinese transfers to that country. As the foremost advocate of nonproliferation norms, and with critical security interests at stake in the Persian Gulf

region, the United States will need to take the lead as this process goes forward.

ACCEPTANCE OF NONPROLIFERATION NORMS

At least two broad trends would suggest that the Chinese arms trade relationship with Iran will become more and more difficult to sustain over the long term. The first involves China's slow but steady acceptance of global arms control and nonproliferation norms beginning in the early 1980s and accelerating over the course of the mid-1990s.

For example, in the 1990s alone, China joined the NPT (1992); China agreed bilaterally with the United States to abide by the parameters of the MTCR (1992); China signed onto the CWC (1993), ratified the treaty (1997), and joined the CWC's governing body as a founding member (1997); China urged North Korea to negotiate the Agreed Framework with the United States that has frozen Pyongyang's nuclear weapons program (1994); China went along with the indefinite extension of the NPT (1995); China halted the provision of a 300-megawatt Qinshan civil nuclear power reactor to Iran (1995); China unilaterally placed a moratorium on its nuclear testing and signed the Comprehensive Test Ban Treaty (1996); China reportedly agreed to stop exporting antiship cruise missiles to Iran and agreed with the United States to stop all nuclear-related assistance to Iran. These steps are part of a broader post-cold war trend that finds China increasingly integrating itself in the international community and accepting a greater role as a major power.

Weakening of Strategic and Political Ties

The second broad trend that suggests the difficulty of sustaining the Chinese arms trade relationship with Iran relates to a diminishing strategic and political rationale

for Sino-Iranian ties. Several factors illustrate this likely trend. First, China's relationship with the Soviet Union and Russia-the difficulties with which were a crucial factor in initiating Sino-Iranian ties in the first place-has dramatically changed. This process began with the historic visit of Mikhail Gorbachev to China in May 1989 which set the two countries on a path toward normalized relations and the eventual establishment of strategic partnership" for China and Russia. "Soviet hegemony," socialist imperialism," "strategic encirclement," and "the tsars' age-old push to warm waters" seem things of the past as Moscow and Beijing continue to strengthen their relationship.

This first point relates to a second. The strategic partnership between China and Russia has strengthened China's international position in relation to the United States and other Western powers such as Japan with which China presently has the greatest mid- to long-range concerns. In the past, countries such as Iran could help China to assert its independence and gain regional influence in China's relationship with major powers. But this is a role that Russia can play far better. Given U.S. dominance internationally since the end of the cold war, it makes sense that China would turn to more powerful and influential players to meet its strategic goals.

Third, the new international environment has meant that Iran has been able to turn increasingly to alternative sources of weaponry Russia, its defense industries reeling from the country's economic and political collapse, finds in Iran a willing cash customer that prefers more sophisticated Russian arms to Chinese weapons. With the end of Soviet hegemonic intentions toward Southwest Asia, Iran can establish a closer relationship with Moscow. As a result, Chinese exports have shifted into narrower niches where it has some proven expertise and into systems other

countries are less willing to export such as cruise missiles, ballistic missiles, and nuclear-related technologies. But even in these areas, China probably cannot compete with potential exports from Russia.

Fourth, as China's modernization races toward the 1990s, so too its dependence on foreign sources of energy has radically increased. As such, China may be increasingly concerned about the stability of the oil-rich Persian Gulf region. This is an argument that has been broached by U.S. officials in their nonproliferation discussions with the Chinese. Perhaps China has listen this argument, even as it seeks diversify its overseas energy sources.

CONTINUING CONCERNS

Nevertheless, in spite of the encouraging developments, a number of serious questions and concerns remain.

First, concerned observers ask whether the observed could have been expected absence of leverage afford U.S.-China summit and other incentives and disincentives. For example, it would appear that the possibility of lifting U.S. sanctions against China had a role in Beijing's decision to bilaterally agree to the MTCR and possibly to join the NPT Sanctions imposed for Chinese missile exports to Pakistan were lifted only after China reiterated its pledge to abide by the MTCR, and accepted the "inherent capability" concept related to missile exports.

In other words, a question arises whether China has taken these steps only because of U.S. threats and incentives or because it has recognized it is in national and international interests do so. There is no clear answer to this question as the record appears mixed. It seems to be the case that constructive nonproliferation activities on the part of China emerge when there is a significant degree of U.S. pressure, and when this pressure is representative of

clearly established international nonproliferation norms.

Second, in the past, there have been a number of occasions when China and the United States differed over their respective interpretations of nonproliferation assurances. This problem leaves the door open for other sales or technology transfers that do not fit explicitly within the pledges that China has made. For example, the Chinese pledge not to sell more antiship cruise missiles to Iran may leave loopholes for other forms of assistance to the Iranian cruise missile program. China accepts the original 1987 MTCR guidelines, but does not accept subsequent revisions to the regime. The United States, too, has been accused of not living up to its nonproliferation pledges-as when it continues to aid Taiwan with increasingly sophisticated weaponry in apparent circumvention of U. S.-China communiqués on this issue. Such actions by the United States can be seen in China as a justification for its proliferation activities.

Unfortunately, with pledges and loosely worded agreements, it is often the spirit rather than the letter that is violated. This suggests that more needs to be done to establish a frank and explicit dialogue among China, the United States, and the international community on nonproliferation. Moreover, a greater effort is needed to foster broader acceptance of the "spirit" or norm of international nonproliferation concepts.

Third, there remain a number of concerns as to how well the Chinese can establish, implement, and enforce the explicit nonproliferation commitments they have undertaken. Some of the positive steps China has taken-such as promulgating nuclear, chemical, and conventional weapon export controls, Joining the CWC, and joining the Zangger Committee will require a more robust and effective export control system in China. Such a system not only

requires the "hardware" of customs monitoring and enforcement at export points, but also the "software" of accepting nonproliferation concepts and norms throughout the government and industrial communities. It appears that in the area of nuclear exports, China has taken a number of critical steps to establish a stronger set of controls. It is less apparent that China has taken similar steps in the areas of chemical, biological, and missile exports. Even in the case of nuclear exports, China should take additional steps to implement controls on dual-use items and to require full-scope safeguards on its nuclear exports.

These export control difficulties are exacerbated by the fact that the Chinese defense industrial base is facing enormous socioeconomic and technoindustrial difficulties. Responsible for the employment and social well-being of hundreds of thousands of workers and their dependents, but with diminishing military procurement orders at home and abroad, some industries-such as aerospace, nuclear technology, and chemicals-will naturally seek money-making opportunities wherever they arise. Moreover, the economic boom of the past fifteen years in China has led to an export-and profit-hungry mentality throughout the government and industrial communities that is inclined to avoid regulations that might curtail potentially lucrative trade opportunities and foreign currency earnings. The stagnating defense-related industries are not immune from this trend, and in fact have been officially encouraged to find new avenues for commercial profit. This is a recipe for potentially troubling exports of sensitive systems and technologies.

Fourth, a problem emerging on the horizon concerns the changing nature of Chinese weapons and military related exports. Such Chinese exports are and will likely continue to be increasingly in the realm of technology transfers, scientific assistance, production technologies,

subcomponents, and dual-use transfers. These transfers will be far more difficult to monitor than exports of complete plants or weapon systems, even if China has every intention to strictly guard against illicit exports. This is not just a problem for China, but is a universal nonproliferation dilemma that all industrialized economies face. As legitimately traded commercial technologies in many cases have military applications, one can only expect that as China's economy grows, so too will its exports of potentially sensitive systems and technologies,

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