

**Unclassified Report to Congress
on the Acquisition of Technology
Relating to Weapons of Mass Destruction
and Advanced Conventional Munitions,
1 January Through 30 June 2002**

The Director of Central Intelligence (DCI) hereby submits this report in response to a Congressionally directed action in Section 721 of the FY 97 Intelligence Authorization Act, which requires:

“(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 DCI Weapons Intelligence, Nonproliferation, and Arms Control Center (WINPAC) drafted this report and coordinated it throughout the Intelligence Community. As directed by Section 721, subsection (b) of the Act, it is unclassified. As such, the report does not present the details of the Intelligence Community’s assessments of weapons of mass destruction and advanced conventional munitions programs that are available in other classified reports and briefings for the Congress.

Acquisition by Country

As required by Section 721 of the FY 97 Intelligence Authorization Act, the following are country summaries of acquisition activities (solicitations, negotiations, contracts, and deliveries) related to weapons of mass destruction (WMD) and advanced conventional weapons (ACW) that occurred from 1 January through 30 June 2002. We have excluded countries that already have substantial WMD programs, such as China and Russia, as well as countries that demonstrated little WMD acquisition activity of concern.

Iran

Iran continued to vigorously pursue indigenous programs to produce WMD-nuclear, chemical, and biological-and their delivery systems as well as ACW. To this end, Iran continued to seek foreign materials, training, equipment, and know-how that have enabled Tehran to produce some complete weapon systems, with their means of delivery, and components of other weapons. During the reporting period, Iran focused particularly on entities in Russia, China, North Korea, and Europe.

Nuclear. Despite Iran's status in the Treaty on the Nonproliferation of Nuclear Weapons (NPT), the United States remains convinced Tehran is pursuing a nuclear weapons program. To bolster its efforts to establish domestic nuclear fuel-cycle capabilities, Iran has technology that also can support fissile material production for Tehran's overall nuclear weapons program.

Iran has continued to attempt using its civilian nuclear energy program to justify its efforts to establish domestically or otherwise acquire assorted nuclear fuel-cycle capabilities. Such capabilities, however, are well suited to support fissile material production for a weapons program, and we believe it is this objective that drives Iran's efforts to acquire relevant facilities. We suspect that Tehran is interested in acquiring foreign fissile material and technology for weapons development as part of its overall nuclear weapons program.

Despite Bushehr being put under IAEA safeguards, Russia's provision of expertise and manufacturing assistance has helped Iran to develop its own nuclear technology infrastructure. In addition, facing economic pressures, some Russian entities have shown a willingness to provide assistance to other nuclear projects within Iran. For example, an institute subordinate to the Russian Ministry of Atomic Energy (MINATOM) had agreed to deliver in late 2000 equipment that was clearly intended for atomic vapor laser isotope separation, a technology capable of producing weapons-grade uranium. As a result of US protests, the Russian Government has halted the delivery of some of this equipment to Iran.

Chinese entities are continuing work on a zirconium production facility at Esfahan that will enable Iran to produce cladding for reactor fuel. As an adherent to the NPT, Iran is required to accept IAEA safeguards on its nuclear material. The IAEA's Additional Protocol requires states to declare production of zirconium fuel cladding and gives the IAEA the right of access to resolve questions or inconsistencies related to the declarations, but Iran has made no moves to bring the Additional Protocol into force. Moreover, Iran remains the only NPT adherent with a full-scope safeguards agreement that has not adopted a subsidiary agreement obligating early declaration of nuclear facilities. Zirconium production, other than production of fuel cladding, is not subject to declaration or inspection.

Missile. Ballistic missile-related cooperation from entities in the former Soviet Union, North Korea, and China over the years has helped Iran move toward its goal of becoming self-sufficient in the production of ballistic missiles. Such assistance during the reporting period continued to include equipment, technology, and expertise. Iran, already producing Scud short-range ballistic missiles (SRBMs), is in the late stages of developing the Shahab-3 medium-range ballistic missile (MRBM). In addition, Iran publicly has acknowledged the development of follow-on versions of the Shahab-3. It originally said that another version, the Shahab-4, is a more capable ballistic missile than its predecessor but later characterized it as solely a space launch

vehicle with no military applications. Iran's Defense Minister has also publicly mentioned a "Shahab-5." Such statements strongly suggest that Tehran intends to develop a longer-range ballistic missile capability.

Chemical. Iran is a party to the Chemical Weapons Convention (CWC). Nevertheless, during the reporting period it continued to seek chemicals, production technology, training, and expertise from Chinese entities that could further Tehran's efforts at achieving an indigenous capability to produce nerve agents. Iran already has stockpiled blister, blood, and choking agents-and the bombs and artillery shells to deliver them-which it previously has manufactured. It probably also has made some nerve agents.

Biological. Even though Iran is part of the Biological Weapons Convention (BWC), Tehran probably maintains an offensive BW program. Foreign dual-use biotechnical materials, equipment, and expertise--primarily, but not exclusively, from Eastern Europe--continued to feature prominently in Iran's procurement efforts. While such materials do have legitimate uses, Iran's biological warfare (BW) program also could benefit from them. It is likely that Iran has capabilities to produce small quantities of BW agents, but has a limited ability to weaponize them.

Advanced Conventional Weapons. Iran continued to seek and acquire conventional weapons and production technologies, primarily from Russia, China, and North Korea. Since Russia announced in November 2000 that it was abrogating the Gore-Chernomyrdin Agreement, the Russian and Iranian Governments and firms have engaged in high-level discussions on a wide variety of military services and equipment - including air defense, naval, air and ground weapons, and technologies. In October 2001, Tehran and Moscow signed a new military-technical cooperation agreement, which laid the groundwork for negotiations and created a commission for future arms sales, but did not itself include sales contracts.

Contract negotiations, which may take years to complete, continued in the following months and at least one sale--apparently for helicopters--was concluded. Various Russian officials and academicians have suggested that sales under this new agreement could, in the next few years, make Iran Russia's third-largest arms customer, after China and India. Until that agreement is concluded, Russia will continue to deliver on existing contracts. Estimates of conventional arms sales to Iran of \$300 million per year would put Iran's share of Russian sales worldwide at roughly 10 percent, compared to more than 50 percent going to China and India.

To facilitate new arms agreements, Russian oil enterprises entered an agreement with the Russian state arms trading firm Rosoboronexport to promote arms exports. Russian and Iranian arms dealers are to include such firms as Lukoil to coordinate "commercial conditions" and participate in projects proposed by the customer.

Outside the Russian market, Iran's search for conventional weapons is global. In particular, Iran capitalized on the specialized weapons services and lower prices that China and North Korea offered. Elsewhere, Iran sought out products, particularly weapons components and dual-use items, that are superior in quality to those available from Russia or that have proven difficult to acquire through normal government channels.

Iraq

During the reporting period, Baghdad continued to deny UN inspectors entry into Iraq as required by Security Council Resolution 687 and subsequent Council resolutions, and no UN inspections took place during the first half of 2002. Moreover, the automated video monitoring systems installed by the UN at known and suspect WMD facilities in Iraq were not operating during this period. Furthermore, Iraq has engaged in extensive concealment efforts and has used the period since it refused inspections to attempt to reconstitute prohibited programs.

Nuclear. More than ten years of sanctions and the loss of much of Iraq's physical nuclear infrastructure under IAEA oversight have not diminished Saddam's interest in acquiring or developing nuclear weapons. Iraq's efforts to procure tens of thousands of proscribed high-strength aluminum tubes are of significant concern. All intelligence experts agree that Iraq is seeking nuclear weapons and that these tubes could be used in a centrifuge enrichment program. Most intelligence specialists assess this to be the intended use, but some believe that these tubes are probably intended for conventional weapons programs.

Iraq had an advanced nuclear weapons development program before the Gulf war that focused on building an implosion-type weapon using highly enriched uranium. Baghdad was attempting a variety of uranium enrichment techniques, the most successful of which were the electromagnetic isotope separation (EMIS) and gas centrifuge programs. After its invasion of Kuwait, Iraq initiated a crash program to divert IAEA-safeguarded, highly enriched uranium from its Soviet- and French-supplied reactors, but the onset of hostilities ended this effort. Iraqi declarations and the UNSCOM/IAEA inspection process revealed much of Iraq's nuclear weapons efforts.

Baghdad, however, still has not provided complete information on all aspects of its nuclear weapons program. Iraq has withheld significant details relevant to its nuclear program, including procurement logs, technical documents, experimental data, accounting of materials, and foreign assistance. Baghdad also continues to withhold other data about enrichment techniques, foreign procurement, weapons design, and the role of Iraqi security services in concealing its nuclear facilities and activities. In recent years, Baghdad has diverted goods contracted under the Oil-for-Food Program for military purposes and has increased solicitations and dual-use procurements--outside the Oil-for-Food process--some of which almost certainly are going to prohibited WMD and other weapons programs. Baghdad probably uses some of the money it gains through its illicit oil sales to support its WMD efforts.

Before its departure from Iraq, the IAEA made significant strides toward dismantling Iraq's nuclear weapons program and unearthing the nature and scope of Iraq's past nuclear activities. In the absence of inspections, however, most analysts assess that Iraq is working to reconstitute its nuclear program--unraveling the IAEA's hard-earned accomplishments.

Iraq retained its cadre of nuclear scientists and technicians, its program documentation, and sufficient dual-use manufacturing capabilities to support a reconstituted nuclear weapons program. Iraqi media have reported numerous meetings between Saddam and nuclear scientists over the past two years, signaling Baghdad's continuing interest in reviving a nuclear program.

Iraq's expanding international trade provided growing access to nuclear-related technology and materials and potential access to foreign nuclear expertise. An increase in dual-use procurement activity in recent years may be supporting a reconstituted nuclear weapons program. The acquisition of sufficient fissile material is Iraq's principal hurdle in developing a nuclear weapon. Iraq is unlikely to produce indigenously enough weapons-grade material for a deliverable nuclear device until the last half of this decade. Baghdad could produce a nuclear weapon within a year if it were able to procure weapons-grade fissile material abroad.

Missile. Iraq has developed a ballistic missile capability that exceeds the 150 kilometer range limitation established under UNSCR 687. During the 1980s, Iraq purchased 819 Scud B missiles from the USSR. Hundreds of these 300 km range missiles were used to attack Iranian cities during the Iran-Iraq War. Beginning in 1987, Iraq converted many of these Soviet Scuds into extended-range variants, some of which were fired at Tehran; some were launched during the Gulf war, and others remained in Iraq's inventory at war's end. Iraq admitted filling at least 75 of its Scud warheads with chemical or biological agents and deployed these weapons for use against Coalition forces and regional opponents, including Israel in 1991.

Most of the approximately 90 Scud-type missiles Saddam fired at Israel, Saudi Arabia, and Bahrain during the Gulf war were al-Husayn variants that the Iraqis modified by lengthening the airframe and increasing fuel capacity, extending the range to 650 km.

Baghdad was developing other longer-range missiles based on Scud technology, including the 900km al-Abbas. Iraq was designing follow-on multi-stage and clustered medium range ballistic missile (MRBM) concepts with intended ranges up to 3,000km. Iraq also had a program to develop a two-stage missile, called the Badr-2000, using solid-propellants with an estimated range of 750 to 1,000 km. Iraq never fully accounted for its existing missile programs. Discrepancies in Baghdad's declarations suggest that Iraq retains a small force of extended-range Scud-type missiles and an undetermined number of launchers and warheads. Further, Iraq never explained the disposition of advanced missile components, such as guidance and control systems, that it could not produce on its own and that would be critical to developmental programs.

Iraq has continued to work on UN-authorized short-range ballistic missiles (SRBMs)--those with a range no greater than 150 km--that help develop the expertise and infrastructure needed to produce longer-range missile systems. The al-Samoud-II liquid propellant SRBM and the al-Fat'h (Ababil-100) solid propellant SRBM, however, have both flown beyond the allowed 150 km range. Both missiles have been tested aggressively and are in early deployment. Other evidence strongly suggests that Iraq is modifying missile testing and production facilities to produce even longer-range missiles.

The Al-Rafah-North Liquid Propellant Engine Research, Development, Testing, and Evaluation (RDT&E) Facility is Iraq's principal site for the static testing of liquid propellant missile engines. Baghdad has been building a new test stand there that is larger than the test stand associated with al-Samoud engine testing and the defunct Scud engine test stand. The only plausible explanation for this test facility is that Iraq intends to test engines for longer-range missiles prohibited under UNSCR 687.

The Al-Mutasim Solid Rocket Motor and Test Facility, previously associated with Iraq's Badr-2000 solid-propellant missile program, has been rebuilt and expanded in recent years. The Al-Mutasim site supports solid-propellant motor assembly, rework, and testing for the UN-authorized Ababil-100, but the size of certain facilities there, particularly those newly constructed between the assembly rework and static test areas, suggests that Baghdad is preparing to develop systems that are prohibited by the UN.

At the Al-Mamoun Solid Rocket Motor Production Plant and RDT&E Facility, the Iraqis, since the December 1998 departure of inspectors, have rebuilt structures damaged during the Gulf war and dismantled by UNSCOM that originally were built to manufacture solid-propellant motors for the Badr-2000 program. They also have built a new building and are reconstructing other buildings originally designed to fill large Badr-2000 casings with solid propellant. Also at Al-Mamoun, the Iraqis have rebuilt two structures used to "mix" solid propellant for the Badr-2000 missile. The new buildings--about as large as the original ones--are ideally suited to house large, UN-prohibited mixers. In fact, the only logical explanation for the size and configuration of these buildings is that Iraq intends to develop longer-range, prohibited missiles.

Iraq has managed to rebuild and expand its missile development infrastructure under sanctions. Iraqi intermediaries have sought production technology, machine tools, and raw materials in violation of the arms embargo. The Iraqis have completed a new ammonium perchlorate production plant at Al-Mamoun that supports Iraq's solid propellant missile program. Ammonium perchlorate is a common oxidizer used in solid-propellant missile motors. Baghdad would not have been able to complete this facility without help from abroad. In August 1995, Iraq was caught trying to acquire sensitive ballistic missile guidance components, including gyroscopes originally used in Russian strategic nuclear submarine-launched ballistic missiles, demonstrating that Baghdad has been pursuing proscribed, advanced, long-range missile technology for some time.

Iraqi officials admitted that, despite international prohibitions, they had received a similar shipment earlier that year.

Chemical. We believe that, since December 1998, Iraq has increased its capability to pursue chemical warfare (CW) programs. After both the Gulf war and Operation Desert Fox in December 1998, Iraq rebuilt key portions of its chemical production infrastructure for industrial and commercial use, as well as former dual-use CW production facilities and missile production facilities. Iraq has attempted to purchase numerous dual-use items for, or under the guise of, legitimate civilian use. Since the suspension of UN inspections in December 1998, the risk of diversion of such equipment has increased. In addition, Iraq appears to be installing or repairing dual-use equipment at CW-related facilities. Some of these facilities could be converted fairly quickly for production of CW agents.

UNSCOM reported to the Security Council in December 1998 that Iraq also continued to withhold information related to its CW program. For example, Baghdad seized from UNSCOM inspectors an Iraqi Air Force document discovered by UNSCOM that indicated that Iraq had not consumed as many CW munitions during the Iran-Iraq war in the 1980s as had been declared by Baghdad. This discrepancy indicates that Iraq may have hidden an additional 6,000 CW munitions.

Biological. During this reporting period, Baghdad continued to pursue a BW program. Iraq in 1995 admitted to having an offensive BW program, but UNSCOM was unable to verify the full scope and nature of Iraq's efforts. UNSCOM assessed that Iraq was maintaining a knowledge base and industrial infrastructure that could be used to produce quickly a large amount of BW agents at any time. In addition, Iraq has continued dual-use research that could improve BW agent R&D capabilities. In light of Iraq's growing industrial self-sufficiency and the availability of mobile or possible covert facilities, we are concerned that Iraq is again producing BW agents.

Advanced Conventional Weapons. Iraq continued to pursue an unmanned aerial vehicle (UAV) program that converted L-29 jet trainer aircraft originally acquired from Eastern Europe. In the past, Iraq conducted flights of the L-29, possibly to test system improvements or to train new pilots. We suspect that these refurbished trainer aircraft have been modified for delivery of chemical or, more likely, biological warfare agents. Iraq is also developing and testing smaller UAVs, some of which are well suited for dispensing chemical and biological agents.

Iraq aggressively continues to seek advanced conventional warfare (ACW) equipment and technology. A thriving gray arms market and porous borders have allowed Baghdad to acquire smaller arms and components for larger arms, such as spare parts for aircraft, air defense systems, and armored vehicles. Iraq also acquires some dual-use and production items that have applications in the ACW arena through the Oil For Food program.

North Korea

Nuclear. The United States has remained suspicious that North Korea has been working on uranium enrichment for several years. However, we did not obtain clear evidence indicating that North Korea had begun constructing a centrifuge facility until recently.

In 2001, North Korea began seeking centrifuge-related materials in large quantities. It also obtained equipment suitable for use in uranium feed and withdrawal systems. North Korea's goal appears to be a plant that could produce enough weapons-grade uranium for two or more nuclear weapons per year when fully operational. We continue to monitor and assess North Korea's nuclear weapons efforts which, given the North's closed society and the obvious covert nature of the program, remains a difficult intelligence collection target.

Missile. North Korea also has continued procurement of raw materials and components for its extensive ballistic missile programs from various foreign sources. In the second half of 2002, North Korea continued to abide by its voluntary moratorium on flight tests, while announcing it may reconsider its September offer to extend the moratorium beyond 2003. The multiple-stage Taepo Dong-2-capable of reaching parts of the United States with a nuclear weapon-sized payload-may be ready for flight-testing. The North probably also is working on improvements to its current design. North Korea is nearly self-sufficient in developing and producing ballistic missiles and has demonstrated a willingness to sell complete systems and components that have enabled other states to acquire longer range capabilities earlier than would otherwise have been possible and to acquire the basis for domestic development efforts.

Chemical. North Korea is not a party to the Chemical Weapons Convention (CWC). P'yongyang has acquired dual-use chemicals that could potentially be used to support P'yongyang's long-standing chemical warfare program. North Korea's chemical warfare capabilities include the ability to produce bulk quantities of nerve, blister, choking and blood agent, using its sizeable, although aging, chemical industry. During the last half of 2002, we believed that North Korea possessed a sizeable stockpile of these agents and weapons, which it could have employed in a variety of delivery means.

Biological. North Korea has acceded to the Biological and Toxin Weapons Convention, but nonetheless has pursued biological warfare (BW) capabilities since the 1960s. P'yongyang has acquired dual-use biotechnical equipment, supplies, and reagents that could be used to support North Korea's BW efforts. As of the last half of 2002, North Korea is believed to have possessed a munitions production infrastructure that would have allowed allow it to weaponize BW agents and may have such weapons available for use.

Libya

Nuclear. An NPT party with full-scope IAEA safeguards, Libya continued to develop its nuclear infrastructure. The suspension of UN sanctions provided Libya the means to enhance its nuclear infrastructure through foreign cooperation and procurement efforts. Tripoli and Moscow continued talks on cooperation at the Tajura Nuclear Research Center and a potential power reactor deal. Such civil-sector work could present Libya with opportunities to pursue technologies that also would be suitable for military purposes. In addition, Libya participated in various technical exchanges through which it could try to obtain dual-use equipment and technology that could enhance its overall technical capabilities in the nuclear area. In 2001, Libya and other countries reportedly used their secret services to try to obtain technical information on the development of WMD, including nuclear weapons. Although Libya made political overtures to the West in an attempt to strengthen relations, Libya's continued interest in nuclear weapons and nuclear infrastructure upgrades raises concerns.

Missile. The suspension of UN sanctions in 1999 allowed Libya to expand its efforts to obtain ballistic missile-related equipment, materials, technology, and expertise from foreign sources. Outside assistance-particularly from Serbian, Indian, Iranian, North Korean, and Chinese entities-has remained critical to its ballistic missile development programs. Libya's capability is improving and with continued foreign assistance it will probably achieve an MRBM capability-a long-desired goal-or extended-range Scud capability.

Chemical and Biological. Libya also remained heavily dependent on foreign suppliers for CW precursor chemicals and other key related equipment. Following the suspension of UN sanctions, Tripoli reestablished contacts with sources of expertise, parts, and precursor chemicals abroad, primarily in Western Europe. Tripoli still appeared to be working toward an offensive CW capability and eventual indigenous production. Evidence suggested that Libya also is seeking to acquire the capability to develop and produce BW agents.

Advanced Conventional Weapons. Following the suspension of UN sanctions, Libyan and Russian firms have completed contracts for conventional weapons, munitions, and upgrades and refurbishment for Libya's existing inventory of Soviet-era weapons.

Syria

Nuclear and Missile. Syria-an NPT signatory with full-scope IAEA safeguards-has a nuclear research center at Dayr Al Hajar. Russia and Syria have approved a draft cooperative program on cooperation on civil nuclear power. In principal, broader access to Russian expertise provides opportunities for Syria to expand its indigenous capabilities, should it decide to pursue nuclear weapons. During the second half of 2001, Damascus continued to receive help from abroad on establishing a solid-propellant rocket motor development and production capability. Syria's liquid-propellant missile program has and will continue to depend on essential foreign equipment and assistance-primarily from North Korean entities and Russian firms. Damascus also continued its efforts to assemble-probably with North Korean assistance-liquid-fueled Scud C missiles.

Chemical and Biological. Syria sought CW-related precursors and expertise from foreign sources during the reporting period. Damascus already held a stockpile of the nerve agent sarin, but apparently is trying to develop more toxic and persistent nerve agents. Syria remained dependent on foreign sources for key elements of its CW program, including precursor chemicals and key production equipment. It is highly probable that Syria also is continuing to develop an offensive BW capability.

Advanced Conventional Weapons. Syria continued to acquire relatively small quantities of ACW-mainly from Russia and other former Soviet-bloc suppliers. But Damascus' outstanding debt to Russia and inability to fund large purchases hampered negotiations for the large quantity of equipment Syria needs to revitalize its aging defense forces. Damascus wanted to acquire Russian SA-10 and SA-11 air defense systems, MiG-29 and Su-27 fighters, and T-80 or T-90 main battle tanks, as well as upgrades for the aircraft, armored weapons, and air defense systems already in its inventory. No breakthroughs in the sales or debt issue have been noted since Syria's Defense Minister met with high-level Russian officials in Moscow in May 2001, although high-level delegations continued to discuss weapons trade.

Sudan

Chemical and Biological. Sudan, a party to the CWC, has been seeking the capability to produce chemical weapons for many years. It historically has obtained help from foreign entities, principally in Iraq. Sudan may be interested in a BW program as well.

Advanced Conventional Weapons. During the reporting period, Sudan sought to acquire a variety of military equipment from various sources. In the long-running civil war, Khartoum is seeking older, less expensive ACW and conventional weapons that nonetheless offer more advanced capabilities than the weapons of its opponents and their supporters in neighboring countries. We remain concerned that Sudan may seek a ballistic missile capability in the future.

India

Nuclear. The underground nuclear tests in May 1998 were a significant milestone in India's continuing nuclear weapons development program. Since the 1998 tests, New Delhi has continued efforts intended to lead to the development of more sophisticated nuclear weapons. During this reporting period, India continued to obtain foreign assistance for its civilian nuclear power program, primarily from Russia.

Missile. India still lacks engineering or production expertise in some key missile technologies. Entities in Russia and Western Europe remained the primary conduits of missile-related and dual-use technology transfers during 2001. During the reporting period, India flight-tested the Agni I ballistic missile and continued work with the Russians on the Brahmos cruise missile.

Advanced Conventional Weapons. ACW acquisitions, primarily from Russia, continued to play an important role in India's across-the-board modernization of its armed forces. Many key programs have been plagued by delays, but New Delhi has received the first of a licensed upgrade of 125 MiG-21-93 fighter aircraft, working with Hindustan Aeronautics, Limited. In 2001, New Delhi concluded an \$800 million contract with Russia for 310 T-90S main battle tanks and a smaller contract for KA-31 helicopters. India was also negotiating with Russia for nuclear submarines and an aircraft carrier. India also continued to explore options for leasing or purchasing several airborne early warning systems. In addition to purchasing the Green Pine radar from Israel, New Delhi also signed a \$270 million contract with Tel Aviv for the ship-borne Barak?1 surface-to-air missile defense system. The Indian Air Force reopened the competition for jet trainer aircraft and is considering bids primarily from the Czech Republic and the United Kingdom.

Israel also sought to expand its defense cooperation with India. In recent months, India and Israel engaged in negotiations for the sale of the Arrow-2 anti-tactical-ballistic missile. Negotiations were also underway regarding the proposed sale of three PHALCON airborne early warning (AEW) aircraft for approximately \$1 billion. India has already taken delivery of the Israeli Greenpine radar for installation at a ground site for use as an early warning platform--in conjunction with the PHALCON AEW aircraft. Israel has also reportedly sold the Harpy unmanned aerial vehicle (UAV) to India.

Pakistan

Nuclear. Pakistan's nuclear weapons tests in late May 1998 demonstrated its well-developed nuclear weapons program. During the reporting period, it continued to acquire nuclear-related equipment, some of it dual use, and materials from various sources--principally in Western Europe. If Pakistan chooses to develop more advanced nuclear weapons, seeking such goods will remain important. China provided extensive support in the past to Islamabad's nuclear weapons and ballistic missile programs, but in May 1996 it pledged not to provide assistance to unsafeguarded nuclear facilities in any state, including Pakistan. We cannot rule out, however, the possibility of continued contacts between Chinese and Pakistani entities on Pakistani nuclear weapons development.

Missile. Pakistan's ballistic missile program continued to benefit from significant Chinese entity assistance during the reporting period. With Chinese entity assistance, Pakistan continues to move toward serial production of solid-propellant SRBMs, such as the Shaheen-I, Abdali, and Ghaznavi. During the reporting period, Pakistan flight-tested three ballistic missiles: the Gauri MRBM, the Hatf III (Ghaznavi) SRBM, and the Hatf II (Abdali) SRBM, and prepared to test the Shaheen I SRBM. Successful development of the two-stage Shaheen-II MRBM will require continued assistance from Chinese entities or other potential sources.

Advanced Conventional Weapons. Pakistan continues to rely on China and France for its ACW requirements. Islamabad received delivery of 40 upgraded Mirage IIIs and Vs from France, and received 40 additional F-7PG fighters from China.

Chemical, Biological, Radiological, and Nuclear Terrorism

The threat of terrorists using chemical, biological, radiological, and nuclear (CBRN) materials continued to rise--particularly in the aftermath of the attacks on 11 September 2001. Several of the 30 designated foreign

terrorist organizations and other nonstate actors worldwide have expressed interest in CBRN-although terrorists probably will continue to favor long-proven conventional tactics such as bombings and shootings.

Increased publicity surrounding the anthrax incidents since the September 11 attacks has highlighted the vulnerability of civilian and government targets to CBRN attacks.

One of our highest concerns is Al-Qaida's stated readiness to attempt unconventional attacks against us. As early as 1998, Bin Ladin publicly declared that acquiring unconventional weapons was "a religious duty."

Terrorist groups worldwide have ready access to information on chemical and biological, and to some extent, even nuclear weapons, via the Internet, publicly available scientific literature, and scientific conferences, and we know that al-Qa'ida was working to acquire some of the most dangerous chemical agents and toxins. A senior Bin Ladin associate on trial in Egypt in 1999 claimed his group had chemical and biological weapons. Documents and equipment recovered from al-Qa'ida facilities in Afghanistan show that Bin Ladin has a more sophisticated unconventional weapons research program than was previously known.

We also know that al-Qa'ida has ambitions to acquire or develop nuclear weapons and has been receptive to any outside nuclear assistance that might become available. In February 2001, during the trial on the al-Qa'ida bombings of the American Embassies in Tanzania and Kenya, a government witness-Jamal Ahmad Fadl-testified that al-Qa'ida pursued the sale of a quantity of purported enriched uranium (which in fact probably was scam material) in Sudan in the early 1990s.

We assess that terrorist groups are capable of conducting attacks using radiological dispersal devices. In addition, we must be alert to the possibility that al-Qa'ida or other terrorist groups might also try to launch conventional attacks against the chemical or nuclear industrial infrastructure of the United States to cause panic and economic disruption.

Key Suppliers

Russia

Russia's cash-strapped defense, biotechnology, chemical, aerospace, and nuclear industries continue to be eager to raise funds via exports and transfers. In addition, some Russian universities and scientific institutes have shown a willingness to earn much-needed funds by providing WMD or missile-related teaching and training for foreign students. Given the large potential proliferation impact of such exports, transfers, and training, monitoring the activities of specific entities as well as the overall effectiveness of the Russian Government's nonproliferation regime remains a high priority.

Nuclear. Russia has played a key role in supporting civilian nuclear programs in Iran, primarily the Bushehr Nuclear Power Plant project. Even though the ostensible purpose of Russian assistance to Iran's nuclear infrastructure is for civilian applications, we assess that such support enhances Tehran's ability to support a nuclear weapons development effort.

President Putin in May 2000 amended the presidential decree on nuclear exports to allow Russia in exceptional cases to export nuclear materials, technology, and equipment to countries that do not have full-scope IAEA safeguards. For example, Russia supplied India with material for its civilian nuclear program in 2001.

Missile. Russian entities during the reporting period continued to supply a variety of ballistic missile-related goods and technical know-how to countries such as Iran, India, and China. Iran's earlier success in

gaining technology and materials from Russian entities has helped to accelerate Iranian development of the Shahab-3 MRBM, and continuing Russian entity assistance most likely supports Iranian efforts to develop new missiles and increase Tehran's self-sufficiency in missile production.

Chemical and Biological. During the first half of 2002, Russian entities remained a key source of dual-use biotechnology, chemicals, production technology, and equipment for Iran. Russia's biological and chemical expertise makes it an attractive target for Iranians seeking technical information and training on BW and CW agent production processes.

Advanced Conventional Weapons. Russia continues to be a major supplier of conventional arms. Following Moscow's abrogation of the Gore-Chernomyrdin agreement in November 2000, Russian officials stated that they see Iran as a significant source of potential revenue from arms sales and believe that Tehran can become Russia's third-largest conventional arms customer after China and India. In 2001, Russia was the primary source of ACW for China, Iran, Libya, and Sudan, and one of the largest sources for India. Russia actively markets its thermobaric weapons at international arms shows.

Russia continues to be the main supplier of technology and equipment to India's and China's naval nuclear propulsion programs. In addition, Russia has discussed leasing nuclear-powered attack submarines to India.

Export Controls. The Duma enacted new export control legislation in 1999, and Putin in 2000 reorganized the export control bureaucracy. In 2001, Putin signed into effect several of the new law's implementing decrees, which updated export control lists for biological pathogens, chemicals, missiles, and related dual-use technologies and equipment. In May 2002, Russia amended its criminal code to allow for stricter punishment for violations involving the illegal export of material, equipment, and scientific-technical information that may be used in creating WMD or military equipment.

Despite progress in creating a legal and bureaucratic framework for Russia's export controls, lax enforcement remains a serious concern. To reduce the outward flow of WMD and missile-related materials, technology, and expertise, top officials must make a sustained effort to convince exporting entities—as well as the bureaucracy whose job it is to oversee them—that nonproliferation is a top priority and that those who violate the law will be prosecuted.

North Korea

Missile. Throughout the first half of 2002, North Korea continued to export significant ballistic missile-related equipment, components, materials, and technical expertise to the Middle East, South Asia, and North Africa. P'yongyang attaches high priority to the development and sale of ballistic missiles, equipment, and related technology. Exports of ballistic missiles and related technology are one of the North's major sources of hard currency, which fuel continued missile development and production.

China

Over the past several years, Beijing has improved its nonproliferation posture through commitments to multilateral arms control regimes, promulgation of export controls, and strengthened oversight mechanisms, but Chinese entities remain key suppliers of WMD and missile-related technologies to countries of concern.

Nuclear. In October 1997, China agreed to end cooperation with Iran on supplying a uranium conversion facility (UCF) and to undertake no new nuclear cooperation with Iran after completion of two existing projects. China also made bilateral pledges to the United States that go beyond its 1992 NPT commitment not to assist any country in the acquisition or development of nuclear weapons. For example, in May 1996,

Beijing pledged that it would not provide assistance to unsafeguarded nuclear facilities. We cannot rule out, however, some continued contacts subsequent to the pledge between Chinese entities and entities associated with Pakistan's nuclear weapons program, and we are concerned that some interactions between Chinese and Iranian entities may run counter to Beijing's expressed bilateral commitments to the United States.

Missile. Beijing on several occasions has pledged not to sell Missile Technology Control Regime (MTCR) Category I systems but has not recognized the regime's key technology annex. China is not a member of the MTCR.

In November 2000, China committed not to assist, in any way, any country in the development of ballistic missiles that could be used to deliver nuclear weapons, and to enact at an early date a comprehensive missile-related export control system. Chinese entities continued to provide Pakistan with missile-related technical and material assistance during the reporting period. Pakistan has been moving toward domestic serial production of solid-propellant SRBMs with the help of Chinese entities. Pakistan also needs continued Chinese entity assistance to support development of solid-propellant MRBMs. In addition, firms in China have provided dual-use missile-related items, raw materials, and/or assistance to several other countries of proliferation concern—such as Iran, Libya, and to a lesser extent, North Korea.

Chemical. Since 1997, the US has imposed numerous sanctions against Chinese entities for providing material support to the Iranian CW program. Evidence during the current reporting period continues to show that Chinese firms still provide dual-use CW-related production equipment and technology to Iran. Advanced Conventional Weapons. China remains a primary supplier of advanced conventional weapons to Pakistan and Iran, and other countries. Beijing and Islamabad also have negotiated the sale of an additional 40 F-7 fighters for delivery to Pakistan.

Emerging State and Non-State Suppliers

As nuclear, biological, chemical, and ballistic missile-applicable technologies continue to be more broadly available around the world, new sources of supply are emerging that are making the challenge of stemming WMD proliferation even more complex and difficult. Nuclear fuel-cycle and weapons-related technologies have spread to the point that, from a technical view, additional states may be able to produce sufficient fissile material and to develop the capability to weaponize it. As developing countries expand their chemical industries into pesticide production, they also are advancing toward at least latent chemical warfare capability. Likewise, additional non-state actors are becoming more interested in the potential of using biological warfare as a relatively inexpensive way to inflict serious damage. The proliferation of increasingly capable ballistic missile designs and technology poses the threat of more countries of concern developing longer-range missiles and posing greater risks to regional stability.

In this context, there is a growing concern that additional states that have traditionally been recipients of WMD and missile-related technology may follow North Korea's practice of supplying specific WMD-related technology and expertise to other countries or non-state actors. Even in cases where states take action to stem such transfers, there are growing numbers of knowledgeable individuals or non-state purveyors of WMD-related materials and technology who are able to act outside the constraints of governments. Such non-state actors are increasingly capable of providing technology and equipment that previously could only be supplied directly by countries with established capabilities.

Although Western European countries maintain rigorous and effective export controls on WMD and missile-related goods and materials, proliferators and associated networks nonetheless continue to seek machine tools, spare parts for dual-use equipment, and widely available materials, scientific equipment, and specialty metals. Western countries are also an important source for the proliferation of WMD-related information and

training. The relatively advanced research of western institutes, the availability of relevant dual-use studies and information, the enthusiasm of scientists for sharing their research, and the availability of dual-use training programs and education may have shortened development time for some WMD programs, particularly those of terrorist organizations.