Russian Arms and Technology Transfers to Iran:

Policy Challenges for the United States

by **Michael Eisenstadt (/experts/michael-eisenstadt)**

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ABOUT THE AUTHORS

Michael Eisenstadt (/experts/michael-eisenstadt)

Michael Eisenstadt is the Kahn Fellow and director of The Washington Institute's Military and Security Studies Program.

Articles & Testimony

In the past decade, Russia has become Iran's main source of advanced conventional arms, an alleged supplier of know-how and technology for its ballistic missile and chemical and biological warfare programs, and its sole source of civilian nuclear technology. Despite sustained U.S. efforts to halt these transfers, they continue, raising unsettling questions about Moscow's intentions, the depth of its commitment to arms control, and the future of U.S.–Russian relations. How the United States deals with this challenge could have far-reaching implications for the stability of the Middle East and the fate of the international non-proliferation regime.

Iran has been seeking to enhance its military capabilities for more than a decade now, in an attempt to increase self-reliance, strengthen deterrence, and achieve the status and influence that it believes is its due. Self-reliance in all areas of national life but particularly in the military sphere is a fundamental tenet of Iran's 1979 Islamic revolution. Thus, Iran has built up its military-industrial base to reduce its reliance on foreign arms suppliers and increase its military potential. Iran also wants to be able to deter potential threats from Iraq, the United States, Israel, and, more recently, Turkey, Azerbaijan, and Afghanistan. Finally, Tehran's efforts to modernize its armed forces and acquire weapons of mass destruction are driven by a desire to bridge the gap between its military weakness and its image of itself as a regional power and the standard bearer of revolutionary Islam. To these ends, Tehran has turned to Russia — the only country that can provide it with arms in the quantity and the quality that it desires.

The security relationship forged by Russia and Iran over the past decade is something of an historical anomaly — the two nations have traditionally viewed each other with suspicion. In the nineteenth century, imperial Russia dominated Persia, annexing territories that had historically belonged to the Persian empire, and with Great Britain conspired to divide the country into spheres of influence. Soviet policy, though generally cautious, was not completely free of such imperial impulses, but with the onset of the Cold War, relations with Iran improved somewhat. Trade increased, and Iran even bought small quantities of arms from the Soviet Union. However, following Iran's 1979 Islamic revolution, relations grew strained. The Ayatollah Ruhollah Khomeini — who reviled both the Soviet Union and the United States — pursued a foreign policy of neither "East nor West" that put Moscow at arms length. For its part, Moscow feared that Tehran would export its Islamic revolution to the Muslims of the Soviet Union.

In June 1989, within weeks of the Ayatollah Khomeini's death, the then-speaker of Iran's parliament, Ali Akbar Hashemi-Rafsanjani, visited Moscow, opening a new chapter in relations with the Soviet Union. After pledging non-interference in each other's domestic affairs (allaying Soviet concerns about the export of Tehran's brand of radical Islam to the Muslim Soviet republics), the two sides negotiated a major arms deal and agreements on trade, economic, and scientific-technical cooperation (including the "peaceful use of atomic energy").

In the decade that followed, Moscow and Tehran frequently found themselves on the same side of various issues of common concern. When this was not the case, they nonetheless proved able to work through their differences. Throughout this period, Tehran tread softly in areas of concern to Moscow, repeatedly deferring to Russian sensibilities in the Caucasus and Central Asia. In particular, Iran's restrained response to Moscow's bloody suppression of a Muslim separatist movement in Chechnya underscored, for Russian policy-makers, the relatively benign thrust of Iranian policy in Russia's backyard.

Thus, a de facto alliance emerged. Moscow came to see Iran as a responsible partner in the pursuit of stability in the Caucasus and Central Asia; a potentially lucrative market for arms and technology produced by its still massive, but cash-starved, military-industrial complex (especially important after Iraq — a major customer — was subjected to a UN arms embargo following its August 1990 invasion of Kuwait); a means by which to continue to exert some influence in the Middle East; and an ally in the fight against American "hegemony." Conversely, Tehran came to see Russia — still a key actor on the international stage, if no longer a superpower — as a partner to its efforts to break out of its international isolation; a reliable source of arms and advanced technology for its armed forces; and an ally in its efforts to counter U.S. influence in the Caucasus, Central Asia, and the Persian Gulf. To be sure, the interests of Russia and Iran are not identical, but their shared interests have consistently outweighed their relatively minor policy differences.

However, for both parties, cooperation is driven as much by fear and mistrust as it is by opportunism and shared interests. Moscow sees arms and technology transfers as a means of securing a foothold in Iran — to ensure that the relationship will survive a rapprochement between Tehran and Washington — and as an insurance policy against Iranian meddling in the Caucasus, Central Asia, and perhaps among Russia's own Muslim population. Ironically, Tehran may see the missiles it is developing with Russian help as a source of leverage over Moscow in the event of a return to the hostility that has historically characterized relations between the two sides. For both sides, cooperation is at least in part a means to neutralize the latent threat posed by a former (and perhaps future) adversary by creating a shared stake in good relations.

Russia's arms and technology transfers to Iran have created diplomatic and security headaches for Washington, as Tehran develops some fairly sophisticated military niche-capabilities and builds ballistic missiles armed with weapons of mass destruction (WMD) that threaten U.S. interests and allies in the region. Even more troubling for Washington, it has been able to do very little about it and its options seem limited.

Conventional Arms

Under the Shah, Iran depended on the United States and the United Kingdom for nearly all its arms. Following the 1979 revolution and the subsequent seizure of the U.S. embassy in Tehran, relations soured, and the United States halted all arms sales to Iran. In September 1980, Iraq invaded Iran, sparking a bloody, eight-year war. To avert an Iranian victory that could have had a destabilizing impact on the region, in 1983 Washington organized an international arms embargo on Iran that greatly complicated Iran's efforts to replace its wartime losses and sustain its war effort. As a result, Iran emerged from the war greatly weakened, much of its military inventory having been destroyed or captured.

In 1989, Iran launched an ambitious effort to rebuild its war-ravaged armed forces and transform itself into a

regional military power. Its military wish list reportedly included 100-200 combat aircraft; 1,000-2,000 armored vehicles; several submarines; and as many as a dozen missile boats. The United States regarded Tehran as a source of instability in a region of vital strategic importance and was alarmed by the magnitude of the purchases Iran was reportedly contemplating. Accordingly, Washington urged its allies to continue honoring the ban on arms sales to Iran imposed during the Iran-Iraq War. Of the major suppliers, only Beijing and Moscow were willing to sell large numbers of conventional arms to Iran, and only the latter could provide many of the modern arms Tehran desired (Endnote #1).

The first major arms agreement between Iran and the Soviet Union, which provided the basis for several future arms contracts, was negotiated during Rafsanjani's June 1989 visit to Moscow (Endnote #2). Following the collapse of the Soviet Union, Russia inherited these contracts but implemented them only in part as a result of disagreements with Tehran over the Soviet debt and Iran's financial problems. Short of money and with Russia insisting on cash payments, Tehran could afford to buy only a fraction of what it had hoped to acquire.

U.S. concerns about the impact of these potentially large arms transfers on Persian Gulf stability led the United States to press Russia to put a halt to them. Russian President Boris Yeltsin pledged to do so in September 1994; this commitment was formalized in an agreement between Russian Prime Minister Viktor Chernomyrdin and U.S. Vice President Al Gore in June 1995, in which Russia promised it would fulfill existing contracts by the end of 1999 and would not sign any new ones. Russia's embrace of this commitment was facilitated by the fact that Iran lacked the funds to pay for several of the contracts it had already signed. What funds it did have were apparently spent mainly on missiles and the means to produce weapons of mass destruction (much of it in Russia).

Major Russian weapons systems transferred in the decade following the 1989 arms deal included 422 T-72 tanks, 413 BMP-2 infantry fighting vehicles, and self-propelled artillery; SA-5 and SA-6 surface-to-air missiles (SAMs); 12 Su-24 and 24 MiG-29 fighters; and three Kilo-class submarines, along with advanced torpedoes and mines. Most of these items were transferred in the early- to mid-1990s (Endnote #3). Of these, the transfer of the Kilo-class submarines and advanced torpedoes and mines caused the greatest concern to Washington. These systems enhanced Iran's sea-denial capability in the Persian Gulf region and enable Tehran to threaten the flow of the 20 percent of the world's oil that passes through the Strait of Hormuz.

Notwithstanding the Gore-Chernomyrdin agreement regarding conventional arms transfers, Russian and Iranian officials reportedly met in early 1997 to discuss new arms deals. These supposedly involved the possible sale of eight Su-25 attack aircraft; 25 Mi-17 transport helicopters; hundreds of T-72 tanks; 500-1,000 SA-16/18 Igla shoulder-launched SAMs; several battalions of SA-10 and SA-12 SAMs; air-surveillance radars; and several other items (Endnote #4). Five Mi-17s were indeed eventually transferred to Iran starting in January 2000 (Endnote #5) (in contravention of the 1995 Gore-Chernomyrdin agreement), while in November 2000, an Israeli newspaper reported the imminent departure of a shipment of 700 SA-16/18 Igla missiles for Iran; it is not clear whether this transfer actually occurred (Endnote #6).

These recent transfers may be a sign of things to come. Iran's economic situation has improved somewhat in the past year, thanks to a disciplined and sustained effort to repay its short-term debt obligations and the recent turnaround of world oil prices. This has allowed for a 50 percent increase in the Iranian defense budget in 2000-2001 over the previous Iranian fiscal year (Endnote #7). Russia's decision to inform the United States in November 2000 that it considered the Gore-Chernomyrdin agreement null and void may harbinger major new conventional arms deals. Indeed, last December, at the conclusion of Russian Defense Minister Igor Sergeyev's visit to Iran (the first of its kind since the 1979 revolution), he declared that Russia and Iran had "concluded a new phase of military and technical cooperation" (Endnote #8).

Ballistic Missiles

The Iran-Iraq War convinced Iran's clerical leadership that an indigenous missile production capability and a strong missile force were essential to the country's security. Several times during the war, Iran exhausted its supply of missiles, in large part because North Korea — its principal supplier — was often unable to keep up with demand. Daily missile strikes on Tehran toward the end of the war had a particularly devastating effect on Iran's morale; more than a quarter of the city's population fled to the countryside each night, contributing to Iran's decision to seek an end to the war in the summer of 1988. The 1991 Persian Gulf War further underscored the survivability of mobile missiles and their growing importance in modern warfare. As a result, Iran has sought the capability to produce everything from short-range to intercontinental systems.

The backbone of Iran's strategic missile force consists of 300 Shahab-1missiles (North Korean Scud-Bs, with a range of 320 kilometers); 100 Shahab-2 missiles (North Korean Scud-Cs, with a range of 500 kilometers); a handful of Shahab-3 missiles (a locally produced version of the North Korean Nodong-1 with some Russian content and a range of 1,300 kilometers); and some 200 Chinese CSS-8 missiles (SA-2 surface-to-air missiles modified for ground-to-ground use, with a range of 150 kilometers). Some of these may be armed with chemical and perhaps biological warheads.

Iran is also reportedly working on a Shahab-4missile, which it claims is a satellite-launch vehicle (reportedly based on the Soviet SS-4, it is said to have a range of 2,000 kilometers), and a Shahab-5(reportedly still in the concept phase, with an estimated range of 5,000-10,000 kilometers). Iran's missiles can reach major population centers in Israel, Turkey, Iraq, and Saudi Arabia, and the smaller Arab Gulf states.

Iran's efforts to develop an indigenous missile production capability date to the mid-1980s. However, it has experienced major problems and delays in its efforts to achieve self-sufficiency, due to shortages of funds, special materials, key production technologies, and highly trained personnel, particularly skilled managers capable of overseeing large, complex projects. As a result, it has had to lean heavily on North Korea, China, and Russia for assistance (Endnote #9). Iran can now produce Shahab-1and -2 missiles on its own, and it is in the final stages of developing the Shahab-3. To date it has conducted three Shahab-3 flight tests (in July 1998, July 2000, and September 2000), though only the second is believed to have been a success.

Since 1994-1995, various Russian individuals and entities have been assisting Iran's missile programs. After obtaining convincing evidence of these activities in early 1997, Washington began pressing Moscow to stop the flow of missile know-how and technology to Iran. Since early 1997, U.S. and Russian officials have met numerous times to discuss this issue.

However, progress has been limited and often short-lived. From mid-1997 through mid-1998, these efforts yielded positive results: a significant decrease in the transfer of know-how and technology, accompanied by a dramatic strengthening of Russian export controls with the issuing of a Russian executive decree in January 1998 and the passing of implementing legislation in May of that year. By mid-1998, however, assistance to Iran's missile programs resumed.

The United States responded by sanctioning a total of eight Russian entities that had allegedly aided Iran's missile program (seven in July 1998 and one in January 1999), though many had no business dealings with the United States and were therefore unaffected by the sanctions. Nonetheless, many of the major firms involved early on in the transfer of know-how and technology are believed to have halted such activities, though they have apparently been replaced by smaller companies and individuals providing mainly technical assistance, according to a U.S. government official. On February 7, CIA Director George Tenet testified to the Senate that "the transfer of ballistic missile technology from Russia to Iran" in 2000 "was substantial and...will continue to accelerate Iranian efforts to develop new missiles and to become self-sufficient in production."

Ambassador Robert Gallucci, who represented the United States in talks with Russia on this topic, has written, "The assistance in question is sometimes material shipped from a Russian entity to Iran that may be used for parts of a ballistic missile, maybe for the warhead, maybe for the fuselage. Sometimes components are shipped that may have to do with guidance. These entities have also been training Iranians in Russia in the development, design and manufacture of ballistic missiles." According to Gallucci, Russian assistance was "extremely important in shortening the amount of time in which the Iranians would be able to develop, manufacture and deploy their own MRBMs [medium-range ballistic missiles]," and he says that Russian assistance will speed the deployment of the Shahab-3 and the development of longer-range missiles (Endnote #10).

The Shahab-3 — and to a much greater extent, the Shahab-4— remain dependent on technology transfers from North Korea and Russia. For instance, North Korean and Russian entities may produce critical engine components for the Shahab-3 and Shahab-4, respectively, that Iran is currently unable to produce on its own (Endnote #11). The Shahab-3 is expected to enter operational service soon, and a cutoff of Russian aid is unlikely to halt the deployment of this missile, though it could hinder efforts to upgrade the basic model. A cutoff could, however, have a decisive impact on the Shahab-4and -5. Continued Russian assistance will also be crucial should Iran choose to incorporate penetration aids on its missiles, as the expertise and experience necessary for the design and development of anything more than the most rudimentary countermeasures against missile defenses probably is beyond the means of Iran's scientific-technical community.

From Iran's perspective, the Shahab-3 (and subsequently the Shahab-4) will provide a variety of new capabilities. The Shahab-3 will enable Iran to target Israel, Turkey, and Egypt, and in the now-unlikely event of an U.S.-Iranian confrontation, the knowledge that they are within range of Iranian missiles could influence decision-makers in Cairo and Ankara during a crisis. Moreover, U.S. missile defenses could have problems intercepting a Shahab-3 flying a depressed or lofted trajectory against targets in the Gulf region. Likewise, the Shahab-4, if and when it becomes operational, will be capable of flying depressed or lofted trajectories against Israel, Turkey, and Egypt, complicating the defense of these countries, and it will be able to reach southern Europe by following an optimal minimum energy trajectory. Finally, due to their greater range, Iran will be able to launch these missiles from more secure launch sites in the interior of the country, thus complicating efforts to locate and destroy the missiles before launch.

For now, however, the main value of these missiles is political. They serve as a symbolic surrogate for the non-conventional capabilities that Iran possesses, but cannot brandish, due to its arms control commitments. Moreover, the fact that Iran possesses missiles capable of hitting targets throughout the region will alter the risk calculus of potential adversaries. While these missiles are of uncertain reliability and accuracy, most adversaries will likely assume that the Iranian missiles will perform in wartime as intended, as the potential price of being wrong will be too great. Adversary decision-makers will therefore act with appropriate caution. As Iranian Defense Minister Ali Shamkhani has stated, the Shahab-3 provides Iran with "a real deterrent punch (Endnote #12)."

Chemical and Biological Warfare

Iran's chemical and biological warfare programs were initiated in the mid-1980s in response to Iraq's extensive use of chemical weapons (CW) during the Iran-Iraq War. An estimated 50,000-100,000 Iranians were injured and 5,000-10,000 were killed as a result of Iraqi CW use. Moreover, there is reason to believe that, had the war continued, Iraq would have used CW against Iranian civilian population centers and biological weapons (BW) against its water supplies. This experience, compounded by the apathetic international response to Iraqi CW use, has left deep wounds in the Iranian national psyche. As a result, Iran has devoted significant resources to its chemical and biological weapons (CBW) capabilities, to serve as a deterrent and to provide it with the means to respond in kind to CBW threats.

Iran is believed to have stockpiled several hundred tons of chemical agent in bulk and weaponized form, including

nerve, blister, choking, and blood agents. It produces bombs and artillery rounds filled with these agents and probably has deployed chemical missile warheads. Less is known about its biological warfare program, although according to published intelligence assessments, Iran has probably produced small quantities of BW agent; some of this may have been weaponized.

Russian individuals and entities have reportedly assisted Iran's chemical and biological warfare programs. According to Tenet's February testimony, "Russian entities are a significant source of dual-use biotechnology, chemicals, production technology, and equipment for Iran. Russian biological and chemical expertise is sought by Iranians and others seeking information and training on BW- and CW-agent production processes."

Beyond this statement, there is little if any additional information in the public domain concerning Russian assistance to Iran's CW effort, though there have been a number of credible published reports concerning Russian assistance to Iran's BW program. Iran has been described by Russian BW researchers as the country most aggressively recruiting scientists from Russia's vast, crumbling biological warfare complex. These efforts reportedly began shortly after the 1991 Persian Gulf War, and according to one report, Iran has succeeded in luring at least five scientists to work in Iran, signing arrangements with others that allow them to conduct research for Iran while remaining in Russia. The Iranians have reportedly shown special interest in infectious diseases, anti-crop and anti-animal agents, and genetic engineering techniques. However, because so little is known about Iran's BW program, it is not possible to assess the impact of whatever assistance may have been rendered by Russian scientists (Endnote #13).

Civilian Nuclear Technology According to public U.S. intelligence assessments, Iran is pursuing the acquisition of nuclear weapons despite the fact that it is a signatory to the nuclear Non-Proliferation Treaty (NPT). It is worth noting that Russian intelligence assessments dating from the mid-1990s (the last time such assessments were published) are basically in accord with U.S. judgment (Endnote #14). However, Russian officials categorically deny that the civilian nuclear technology they are providing Iran could aid an effort to build nuclear weapons.

Iran's nuclear program dates to the era of the Shah, who initiated efforts in the civilian as well as the military spheres. Both were shelved following the 1979 Islamic Revolution, but in 1984 Tehran revived the civilian program and with it the Islamic Republics nuclear ambitions. For nearly a decade and a half, Iran has been trying to acquire materials and civilian nuclear fuel-cycle technologies that could be of use to a clandestine nuclear weapons program, including fuel fabrication and reprocessing capabilities from Argentina; research reactors from Argentina, India, China, and Russia; nuclear power plants from Russia and China; gas centrifuge technology from Switzerland and Germany and a gas centrifuge enrichment plant from Russia; a uranium conversion plant from China or Russia; and a laser isotope separator from Russia that can be used for enrichment.

Thanks to Iran's financial woes and a sustained U.S. effort to deny Tehran access to nuclear technology, Iran has had little success in building up its declared civilian nuclear infrastructure, though its efforts to acquire fuel-cycle-related facilities will undoubtedly continue. Iran has also been seeking materials and components that could be used to build nuclear weapons. In 1992, Iran apparently tried (unsuccessfully) to acquire a cache of highly enriched uranium from a facility in Kazakhstan; its agents have reportedly continued shopping for fissile material on the black market since then. In 1998, Iran reportedly acquired some tritium, which is used to build boosted weapons, from Russia, while in 1999 an Iranian living in Sweden was caught trying to smuggle thyratron tubes to Iran (Endnote #15).

The centerpiece of Iran's overt nuclear effort is its civilian nuclear power program, run by the Atomic Energy Organization of Iran (AEOI). As a first step toward realizing its long-term goal of relying on nuclear power for 20 percent of the country's electricity needs, Iran intends to complete the unfinished German nuclear power plant begun in Bushehr in 1975 but halted by the 1979 revolution. In August 1992, Moscow agreed to finish the Bushehr

power plant, and in January 1995, as part of a broader nuclear cooperation accord concluded at that time, Russia signed a contract to install one VVER-1000 reactor in Bushehr for a cost of $800 million and to train Iranian personnel and provide low-enriched uranium fuel to run it. Washington unsuccessfully lobbied Moscow to cancel the reactor deal (though Moscow eventually agreed to take back the fuel for reprocessing). The United States did, however, succeed in persuading firms in the Ukraine and the Czech Republic not to supply components to the reactor, thus complicating Russian efforts to complete the power plant at Bushehr.

The Bushehr reactor has faced several other major obstacles, including questions about the structural integrity of the original foundation and containment structure (which was bombed during the Iran-Iraq War and exposed to the elements for many years), the viability of installing Russian reactor hardware into structures configured for German components, and Iran's financial problems. These problems have delayed the program; initially slated to be completed by 1999, the first VVER-1000 at Bushehr is not expected to be finished before 2003. Iran and Russia have also discussed the construction of two or three VVER-440/213 reactors and an additional VVER-1000 at Bushehr. Russian Atomic Energy Minister Yevgeniy Adamov announced in January of this year that his ministry is starting work on a "feasibility study" for at least one of these.

U.S. officials claim that Iran's interest in nuclear power is driven — in large part — by a desire to gain access to Russia's vast nuclear complex in order to facilitate the acquisition of know-how, technology, and materials for its clandestine nuclear weapons program. However, while objecting to Russian assistance to Bushehr, they downplay its significance as a source of plutonium for a clandestine weapons program since the fissile material there would be safeguarded and Iran would probably use Bushehr to burnish its bona fides as an NPT signatory in good standing.

But should an Iraqi nuclear breakout or a crisis cause Iran to violate or withdraw from the NPT, the presence of large quantities of spent fuel at Bushehr would pose an acute proliferation risk. Experience in Iraq in 1990 and North Korea in 1993 shows that states will violate their NPT commitments or withdraw from the treaty when they believe their vital interests require them to do so. Officials from Russia's Ministry of Atomic Energy scoff at the idea that reactor-grade plutonium could be used to build a bomb, but in 1962 the United States successfully tested a bomb using reactor-grade plutonium to see if it could be done.

The Bushehr reactor is not the only element of Russian–Iranian nuclear cooperation to which U.S. officials have objected. As part of the January 1995 nuclear cooperation accord, Russia also offered Iran 2,000 tons of natural uranium, help establishing a uranium mine, low-power (less than 1 megawatt) training reactors, a gas centrifuge enrichment plant, an option to purchase a 30-50 megawatt light-water research reactor, an APWS-40 nuclear-powered desalinization plant, and training for 10-20 AEOI employees annually (at the graduate student and Ph.D. level).

The United States was particularly concerned with the offer of a gas centrifuge enrichment plant and research reactor, which it believed could greatly assist an Iranian nuclear weapons program. During a May 1995 U.S.-Russia presidential summit in Moscow, Russia agreed to drop all components of the agreement not directly connected to the Bushehr power plant. This commitment was formalized during a December 1995 meeting between Vice President Gore and Prime Minister Chernomyrdin.

In recent years, various Russian entities have held negotiations with Iran concerning the transfer of dual-use fuel-cycle-related technologies, including heavy-water research reactors, uranium conversion plants, and most recently, a laser isotope separator. Two entities allegedly involved in such talks — NIKIET and the Mendeleyev University of Chemical Technology — were sanctioned by the U.S. government in January 1999. Moscow argues that, because Iran is a member of the NPT in good standing, it should not be denied nuclear fuel-cycle-related technology. Due to U.S. pressure, Russia has agreed not to go forward with these deals — at least for now. However, because Iran is a potentially lucrative customer for Russia's Ministry of Atomic Energy, it is unlikely that Russia has abandoned efforts

to sell fuel-cycle-related technology to Iran.

Indeed, in recent Senate testimony, Assistant Secretary of State for Nonproliferation Robert Einhorn stated that, despite Moscow's promises, many government-affiliated entities have continued "extensive cooperation" with Iran on nuclear projects beyond the Bushehr plant and that this assistance "has accelerated in the last few years." According to Einhorn, "Much of this assistance involves technologies with direct application to the production of weapons-grade fissile materials...and could significantly shorten the time Iran would need to acquire weapons-usable fissile material."

As Iran's sole supplier of nuclear technology, Russian assistance remains crucial to Iran's efforts to acquire nuclear weapons. Russia could aid this process by transferring to Iran technologies used to produce fissile material or by unwittingly allowing Iranian agents the access needed to acquire fissile materials diverted from Russia's massive nuclear complex.

Iran's acquisition of nuclear weapons would have a dramatic impact on the strategic environment in the Middle East by altering the regional balance of power and encouraging further proliferation in the region and beyond. An Iranian nuclear breakout would also undermine international non-proliferation norms, put U.S. forces in the region at risk, and pose a direct threat to U.S. friends and allies. For these reasons, preventing such an eventuality is a critical U.S. interest.

What to Do? Russian arms and technology transfers to Iran are among the most serious proliferation challenges facing the United States today. While Russia's conventional arms transfers and assistance to Iran's civilian nuclear program do not violate any international non-proliferation regime, at least some of its arms transfers (advanced naval mines, torpedoes, and Kilo-class submarines) and most of its activities in the nuclear arena seem imprudent — to say the least. And in aiding Iran's civilian nuclear program, Russia is violating a broad international norm, as it is the only country in the world now engaged in open-ended nuclear cooperation with Iran (Endnote #16).

Russian aid to Iran's missile and CBW programs, however, would clearly violate various international arms control regimes. Some of the aid in the CBW arena involves the transfer of dual-use materials and technologies, but there are indications that more sinister dealings are taking place, including the recruitment of scientists from Russia's massive BW complex. But it is unclear whether the activities of these scientists are officially sanctioned.

On the other hand, it is hard to avoid the conclusion that assistance to Iran's ballistic missile program occurs, by and large, as a matter of policy. This has been going on for more than five years now, and, while U.S. pressure may have at one time caused a temporary cessation of activities and caused some individuals and entities to cease cooperating with Iran, other individuals and entities have come forward to take their place; the assistance continues unabated. Furthermore, reports (in both the Russian and Western press) that the Russian Security Service has facilitated at least some transfers of missile know-how and technology strengthens the impression that there is official support for these activities.

The occasional zigzags in Russian policy regarding arms and technology transfers to Iran may be due to a number of factors, including the twists and turns of politics in Moscow; delight in occasionally sticking a finger in Washington's eye; U.S. pressure and a desire not to imperil ties with Washington; Iranian counter-pressure and a desire not to imperil ties with Tehran; and the temptation to profit from its tremendous investment in its military-industrial complex while avoiding blatant violations of its various arms control commitments.

The most powerful explanation for these arms and technology transfers is that they serve a number of key Russian interests. They provide an income stream for the cash-starved military-industrial complex, avert Iranian meddling in Russia's domestic affairs and its near-abroad, and build up Iran as a limiting force on Americas global power. These are arguments that both bureaucrats in Moscow and underpaid scientists employed by state-funded institutes

can agree on. And they are powerful rationalizations for scientists who may independently sell their services to Iran. Certainly, the political and economic environment in Russia today is conducive to such activities.

To be sure, the policy of transferring arms and technology to Iran does not enjoy unanimous support in Moscow. Some fear that Iran's missile and WMD programs have the potential to someday threaten Russian interests — perhaps even Russia itself. But supporters of the policy apparently reason that arms and technology transfers may be the best way to forestall a deterioration in relations with Tehran (Endnote #17); that Iranians are anyhow incapable of building long-range missiles and nuclear weapons; and that, even if they succeed, Russia would retain overwhelming strategic superiority that would be sufficient to deter threats from a distant, hostile Iran. Though Russia is hardly the first country to use arms and technology transfers as part of a policy of engagement vis-à-vis former adversaries, Moscow is playing a high-risk version of this game. It remains to be seen whether this gambit will succeed.

Several policy implications flow from this assessment. First, because Moscow provides arms and technology to Tehran not just to earn cash, but also to advance important security interests, Russia seems unlikely to halt its arms and technology transfers to Iran in response to economic sanctions or inducements of the kind that have been considered to date (e.g., sanctioning Russian entities involved in proliferation, threatening funding to the International Space Station, or lowering or raising quotas for Russian commercial space launches). Furthermore, Washington's willingness to take stricter steps — should it be decided that this is what is needed — will depend, in part, on the general trajectory of U.S.–Russian relations as set by Presidents George W. Bush and Vladimir Putin in the coming months.

Second, experience shows that publicity, persistent pressure, and high-level attention can yield modest results. Here, timely leaks that highlight irresponsible Russian actions, accurate and timely intelligence that facilitates preventive diplomacy, and a good working relationship between U.S. and Russian leaders, combined with sustained interest and involvement on the part of the American president, are critical to success.

Finally, while U.S.–Russian cooperative security programs will not halt purposeful technology transfers to Iran or others, they can still protect against unauthorized diversions by proliferators. Thus, U.S. funding for these programs should not be cut in order to punish Russia for its arms and technology transfers to Iran, as has been suggested by some in Washington; these programs remain in the U.S. interest, though funding should certainly not go to entities or firms that wittingly assist proliferators such as Iran.

U.S. options vis-à-vis Iran are also rather limited. Tehran is unlikely to agree to curb conventional arms purchases (given the relatively small size and limited capabilities of its armed forces) or abandon efforts to build a robust missile force, which constitutes the backbone of its strategic deterrent and is not limited by any arms control regimes to which Iran is party. As for weapons of mass destruction, Iran denies that it is engaged in any activities proscribed by the various treaties it is party to (the Chemical Weapons Convention, the Biological Weapons Convention, and the NPT).

Iran's motives for acquiring missiles and WMD are varied and complex. Its quest for self-reliance and regional influence are partly rooted in the values of the Islamic Republic and thus will not be easily altered. Tehran's clerical leadership seems relatively united in its desire to acquire WMD, and, while some reformers may be concerned about the impact of such policies on Iran's foreign relations and economy, their hard-line conservative opponents are currently on top in Tehran. It will not be possible to explore the possibility of a "grand bargain" with Iran regarding its WMD programs until domestic political alignments in Tehran change and U.S. and Iranian representatives can sit down together to discuss these issues. This is unlikely to happen anytime soon, but, in the meantime, steps such as people-to-people contacts and track-two diplomacy should be taken to facilitate an eventual resumption of official contacts (Endnote #18).

U.S. policy toward Iran has scored one unambiguous achievement: it has succeeded in imposing significant costs and delays on Iran's efforts to build up its conventional, missile, and WMD capabilities through such traditional tools as export controls, demarches, arm-twisting, and economic sanctions. It has thwarted several major conventional arms deals and countless smaller ones. It has cut off Iran from Western arms and technology sources, forcing it to rely on less-advanced suppliers, such as North Korea, China, and Russia. U.S. efforts were also instrumental in thwarting a large number of prospective deals concerning technologies useful for the development of WMD — particularly in the civilian nuclear arena. Due in large part to U.S. prompting in the 1980s, U.S. allies in Europe have imposed tight restrictions on the transfer of many types of dual-use technology to Iran while banning the transfer of arms or nuclear technology outright.

However, U.S. efforts to urge Russia, North Korea, and China to adopt restrictions on arms and technology transfers to Iran have met only with very limited success. North Korea is still supplying missiles and missile production technology. China is still supplying conventional arms and materials and technology for Iran's CBW program, though it has pledged to halt aid to Iran's ballistic missile and civilian nuclear programs. Russia, however, still provides conventional arms and technology for Iran's missile and WMD programs.

The United States should seek to build on its successes, by continuing with the methods that have worked. Sanctions have been a particularly important policy tool. Iran's economy has been its Achilles heel and the main obstacle to the realization of its military ambitions. Iran's economic woes — which have been exacerbated by U.S. sanctions — have repeatedly forced Tehran to pare back and delay the procurement of arms and technology. Lacking the funds to sustain a major, across-the-board military buildup, Iran has had to content itself with selectively enhancing its military capabilities. Despite recent improvements in Tehran's economic circumstances, the economy remains the main constraint on Iran's efforts to acquire arms and technology from Russia — though it is a less significant factor than it was just a few years ago.

As long as there remain reasonable grounds for suspecting that Iran is violating its arms control obligations, the United States should maintain sanctions on Tehran. The unilateral rescission of various executive orders that restrict trade and investment in Iran as part of a policy of "engagement" might yield short-term economic benefits for U.S. business but would likely do long-term damage to the security of the United States and its allies. These sanctions are an important source of leverage for the United States and should not be lifted without quid pro quos from Iran that address Washington's proliferation concerns.

Russian arms and technology transfers to Iran remain a policy challenge for which there are no simple solutions. But the problem must be actively managed — at the presidential level —lest it get worse. This is a lesson that the new Bush administration will hopefully take to heart, for while it may be difficult and frustrating to deal with the problem of preventing proliferation from Russia, it is preferable to dealing with the challenges of a nuclear Iran armed with long-range missiles.

Russian–Iranian Nuclear Cooperation Accord

January 8, 1995 Protocol of negotiations between Professor V.N. Mikhailov, Minister of Atomic Energy of the Russian Federation, and Director R. Amrollahi, Vice President of the Islamic Republic of Iran and Chairman of the Atomic Energy Organization of Iran.

From January 5-8, 1995, Minister of Atomic Energy of the Russian Federation, Prof. V.N. Mikhailov, visited Iran at the request of the Vice President of the Islamic Republic of Iran, Chairman of the Atomic Energy Organization of Iran, Director R. Amrollahi. During this visit, negotiations concerning cooperation in the peaceful use of atomic energy were held. The two parties expressed their satisfaction with the results of the visit and reached the following agreements:

1. The present protocol establishes that the contract for completing the construction of Block No. 1 at the Bushehr Nuclear Power Plant (NPP), which was signed by the Russian firm Zarubezhatomenergostroy and by the Atomic Energy Organization on January 8, 1995, shall be carried out by the parties.

2. The parties exchanged letters in which the principal questions concerning cooperation on completing construction of Block No. 1 at the Bushehr NPP in Iran were decided.

3. To utilize Iranian personnel, as much as possible, especially for completing Block No. 1 at the Bushehr NPP.

4. The subsequent delivery of fuel for Block No. 1 at the Bushehr NPP will be done as stipulated and at world prices.

5. Within a month, the Russian side will instruct the corresponding Russian organization to submit a proposal for the training of Iranian personnel, so that after a preliminary period of operation, Block No. 1 at the Bushehr NPP can be run exclusively by Iranian personnel.

6. The parties instruct their competent organizations to prepare and sign:

— in three months, a contract for delivery of a light water reactor for research with a power of 30-50 MWt from Russia;

— in the first quarter of 1995, a contract for the delivery of 2,000 tons of natural uranium from Russia;

— in the first quarter of 1995, a contract for the preparation/training for Atomic Energy Organization of Iran scientific personnel, 10-20 (graduate students and Ph.D.'s) annually, at Russian academic institutions;

— within six months time, a contract for the construction of a uranium mine in Iran, after which negotiations will be conducted on the signing of a contract for the construction of a centrifuge plant for enrichment of uranium according to conditions, which are comparable to conditions of contracts concluded by Russian organizations with firms in other countries.

7. The parties have agreed:

— On cooperation in the construction of research reactors of low power (less than 1 MWt) in Iran for instructional purposes. Over a six month period, the Russian side will transfer a technical-commercial proposal to the Iranian side on this matter;

— To examine the issue of cooperation on the construction of a desalination plant in Iran;

— To carry out meetings, no less frequently than once a year, on the high level of Russia's MINATOM and the Atomic Energy Organization of Iran for the organization of operational control for the implementing of cooperation, especially for the work in connection with the construction of Block No. 1 at Bushehr NPP.

The discussions were carried out in a friendly manner.

Two copies of the present protocol were signed in Iran, January 8, 1995, one each in Russian and Persian.

V.N. Mikhailov

Minister of Atomic Energy

Of the Russian Federation

R. Amrollahi

President of the Atomic

Energy Organization of Iran

Translated by the Natural Resources Defense Council.

Russian Entities Alleged to Have Assisted Iran's Missile Program

Entity Alleged Activity Action Taken

Baltic State Technical University Training of Iranian personnel Denied U.S. funding (March 1998), sanctioned by the United States (July 1998)

Bauman Technical University Training of Iranian personnel

Europalas 2000 Attempted transfer of special steel via Azerbaijan Sanctioned by the United States (July 1998)

Federal Security Service (FSB) Facilitated travel of Russian specialists to Iran

Glavkosmos Transferred dual-use missile production technology Sanctioned by the United States (July 1998)

Grafit Research Institute Transferred graphite ablative materials to Iran Sanctioned by the United States (July 1998)

INOR Scientific Center Transferred special mirrors, composite materials, foils, and metals to Iran Sanctioned by the United States (July 1998), restrictions lifted (April 2000)

Kominterm Plant (Novosibirsk) Missile specialists traveled to Iran under false documents Suspicions not substantiated, sanctions not imposed

MOSO Company Attempted transfer of special steel via Azerbaijan Sanctioned by the United States (July 1998)

Moscow Aviation Institute Training of Iranian personnel Denied U.S. funding (March 1998), sanctioned by the United States (January 1999)

NPO Energomash Transferred SS-4 engine technology Suspicions not substantiated

NPO Trud Transferred engine components, documentation, and engine test equipment; contracted to manufacture engine turbopumps Lattermost effort thwarted; no recent signs of activity with Iran

Polyus Science and Research Institute Transferred missile guidance technology and assisted with design of Shahab-3 guidance package Sanctioned by the United States (July 1998), restrictions lifted (April 2000)

Russian Space Agency According to Israeli intelligence, Director Yuri Koptev facilitated technology transfers

Rosvoorouzhenie Arms Export Agency According to Israeli intelligence, recruited Russians to assist Iranians and facilitated several technology transfers

Tikhomirov Institute Unclear Suspicions not substantiated, sanctions not imposed

TsAGI Central Aerohydrodynamic

Institute Contracted to build wind tunnel; transferred model missiles and missile design software Denied U.S. funding (March 1998), no recent signs of activity with Iran

Sources: Fred Wehling, Russian Nuclear and Missile Exports to Iran, The Nonproliferation Review, Winter 1999, pp. 134-143; The Russian List, The Iran Brief, March 2, 1998, pp. 9-10; The Washington Times, various articles; and interview with senior U.S. government official, February 23, 2001.

Note: This table provides a snapshot of alleged activities based on information primarily from the 1997-1998 timeframe. Some firms listed here may have been involved in activities with Iran on a one-time basis; others may have been involved on an ongoing basis. In general, however, many of the major firms involved very early in the transfer of know-how and technology to Iran have bowed out and have been replaced by smaller companies and individuals providing mainly technical assistance, according to a senior U.S. official.

NOTES

The author would like to thank Liat Radcliffe, Rachel Stroumsa, and Ashraf Zeitoon for their research assistance in preparing this article.

1. Iranian arms buyers also approached several Eastern European states. However, due to U.S. pressure, Romania, Hungary, Yugoslavia, and the Czech Republic rebuffed the Iranian approaches, as did Poland — after selling about 100 T-72 tanks to Iran.

2. According to a seemingly authoritative Russian account, Moscow and Tehran signed four major arms contracts between 1989 and 1991 that were the basis for nearly all conventional arms transfers during the 1990s. Igor Korotenko, "Russia and Iran Renew Collaboration; Tehran May Take Third Place in Volume of Russian Arms Purchases," Nezavisimoye Voyennoye Obozreniye, January 12, 2001.

3. These estimates are based on several sources, including Shlomo Brom and Yiftah Shapir, eds., The Middle East Military Balance: 1999-2000(Cambridge, MA: MIT Press, 2000) pp. 188-189; IISS, The Military Balance: 2000-2001(London: Oxford University Press, 1999) pp. 132, 139; the UN Register for Conventional Arms, various years.

4. Bill Gertz, "Russia Sells Missiles to Iran," Washington Times, April 16, 1997, p. A1; Bill Gertz, "Russia Told U.S. Air-Defense Arms Not Sold to Iran," Washington Times, April 17, 1997, p. A9; Korotenko, "Russia and Iran Renew Collaboration," op. cit.

5. "Russia Resumes Arms Sales to Iran,"Iran Times, January 21, 2000, pp. A1, A4.

6. Orly Azulay-Katz and Eytan Amit, "Hundreds of Missiles En Route From Russia to Iran," Yediot Aharonot, November 24, 2000, p. 6.

7. International Monetary Fund, Islamic Republic of Iran: Recent Economic Developments, July 12, 2000, pp. 112-113.

8. Scott Peterson, "Russians Tighten Ties to Iran," The Christian Science Monitor, January 26, 2001.

9. In November 2000, China announced that it would not help any country develop ballistic missiles capable of carrying nuclear warheads. It remains to be seen whether they will live up to this commitment.

10. Robert Gallucci, "Iran-Russia Missile Cooperation: The United States View," in Joseph Cirincione, ed., Repairing the Regime: Preventing the Spread of Weapons of Mass Destruction (Washington, D.C.: The Carnegie Endowment for International Peace, 2000), pp. 186, 188.

11. Bill Gertz, "North Korea Sells Iran Missile Engines," Washington Times, February 9, 2000, p. A1; Robert D. Walpole, testimony before the International Security, Proliferation and Federal Services Subcommittee of the Senate Governmental Affairs Committee, September 21, 2000; David Hoffman, "Russia Says It Thwarted Attempt by Iran to Get Missile Technology," Washington Post, October 3, 1997, p. A35.

12. "Iran to Test Motor for New Space Rocket," Agence France Presse, February 7, 1999.

13. Amy E. Smithson, Toxic Archipelago: Preventing Proliferation for the Former Soviet Chemical and Biological Weapons Complexes (Washington, D.C.: The Henry L. Stimson Center, 1999), p. 17; Judith Miller with William J. Broad, "Bio-Weapons in Mind, Iranians Lure Needy Ex-Soviet Scientists," The New York Times, December 8, 1998, p. A1.

14. A New Challenge After the Cold War: Proliferation of Weapons of Mass Destruction (Moscow: FIS, 1993), translated in JPRS-TND, March 5, 1993, p. 28; Treaty on the Non-Proliferation of Nuclear Weapons: Problems of Its Prolongation, (Moscow: FIS, 1995), pp. 56-59.

15. Though a dual-use item, these may be used in the explosive package of a nuclear weapon. Susanna Loof, "Swedish Student Suspected of Smuggling Nuclear Weapon Technology to Iran," AP Worldstream, October 11, 1999.

16. In October 1997, China told the United States that it would not sign any new contracts regarding civilian nuclear cooperation with Iran once two projects of limited proliferation concern that were then underway (a zero-power reactor and a factory to produce zirconium cladding for fuel rods) were completed.

17. Brenda Shaffer, Partners in Need: Russia and Iran (Washington, D.C.: The Washington Institute for Near East Policy, forthcoming).

18. Portions of this section are drawn from Michael Eisenstadt, "Can the United States Influence the WMD Policies of Iraq and Iran?" Nonproliferation Review, Summer 2000, pp. 63-76.

Michael Eisenstadt is a senior fellow at The Washington Institute for Near East Policy.

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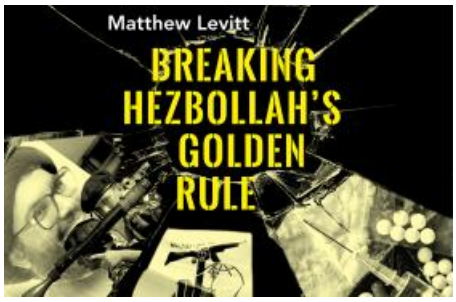

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