RUSSIAN NUCLEAR AND MISSILE EXPORTS TO IRAN

by Fred Wehling¹

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he Russian government's apparent support for, or inability to prevent, transfers to Iran of technology related to nuclear weapons and ballistic missiles has raised serious concerns in the United States, Israel, and other countries. The United States and Israel have protested Russia's nuclear and missile exports at the highest diplomatic levels, and the United States has applied economic sanctions to Russian firms and research institutes suspected of transferring sensitive technology to Tehran.² Russia has responded to these overtures by investigating the activities of some organizations suspected of involvement in missile-technology transfers and by canceling some exports that could quickly upgrade Iran's capability to produce fissile material usable in nuclear weapons.³ Russia claims that it is fulfilling its obligations under international law to control the proliferation of both nuclear weapons and ballistic missiles.⁴ Nevertheless, Russia's Ministry of Atomic Energy (Minatom) continues aggressively to promote exports of nuclear technology and materials to Iran. Likewise, Russian missile firms and research institutes, short of orders and strapped for cash during Russia's continuing economic crisis, look to Iran and other countries of proliferation concern for markets for their products and technology.⁵

This report summarizes Russia's exports of nuclear and missile technology and materials to Iran, so far as they can be determined from open sources. Information presented includes officially acknowledged deliveries, plans for future exports, and cancellations of negotiated sales, and reports of unsanctioned or clandestine transfers that appear credible. This summary will not assess the contribution of these exports to Iran's nuclear and missile programs and will not undertake a legal evaluation of Russia's compliance with international law or applicable treaties. Instead, it presents a compilation of what is known about Russia's exports of sensitive technologies to one country of proliferation concern, together with a brief evaluation of what these exports indicate about the strength of Russia's de facto commitment to international nonproliferation and technologytransfer regimes. Each section below begins with a summary overview, then provides fuller details, and then discusses nonproliferation implications.

OVERVIEW OF NUCLEAR EXPORTS

Pursuant to an agreement signed in January 1995, Russia is constructing a light-water power reactor for Iran's nuclear power station at Bushehr, which is located in southwestern Iran, along the Persian Gulf. This deal has raised significant proliferation concerns, despite pledges by both countries that the reactor will be placed under International Atomic Energy Agency (IAEA) safeguards.⁶ Although the United States has repeatedly raised these concerns through high-level diplomatic channels, Russia remains determined to fulfill its obligations under the \$800 million deal, and the Bushehr reactor is scheduled for completion in 2003. Iran has asked Russia to bid on the construction of three additional power reactors, the price for which could total up to \$3 billion.⁷ Negotiations over the sale of a heavy-water research reactor were reported in December 1998, and blueprints for these facilities were reportedly provided to Iran.⁸ Plans to construct a gas centrifuge plant in Iran, however, have been cancelled. The status of reported deals to provide a light-water research reactor and a nuclear-powered desalination plant remains uncertain. In August 1995, Russia entered into a 10-year contract to supply nuclear fuel for the Bushehr plant. Although the January 1995 agreement originally provided for the delivery of 2,000 metric tons (MT) of natural uranium, this aspect of the agreement may have been cancelled.⁹ Some reports, which Moscow has consistently denied, indicate that Russia has also provided assistance in mining and milling technology to Iran, possibly through clandestine channels without official approval.¹⁰ Russia is currently training Iranian physicists and engineers at a leading center for nuclear research in Moscow and a nuclear power station at Novovoronezh.¹¹

Category	Status	Export	Manufacturer	Exporter	Recipient
Reactors	ongoing	one VVER-1000 light-water power reactor	Zarubezhatomenergostroy	Minatom	Bushehr Nuclear Power Plant
	under negotiation	three additional power reactors	Zarubezhatomenergostroy	Minatom	Bushehr Nuclear Power Plant, possibly others
	under negotiation	one 30-50 MWt research reactor	Zarubezhatomenergostroy	Minatom	Atomic Energy Agency of Iran
	under negotiation	one 40 MWt heavy-water research reactor	probably Zarubezhatomenergostroy	Scientific Reseach and Design Institute of Energy Technologies (NIKIET)	unknown
	unknown	one APWS-40 desalinization plant	Experimental Machine Building Design Bureau (OKBM)	Minatom	unknown
Enrichment, mining, and milling	under negotiation	uranium conversion facility	unknown	NIKIET and Mendeleev University of Chemical Technology	unknown
	cancelled	gas centrifuge plant	unknown	Minatom	Atomic Energy Agency of Iran
	unknown	assistance to mining and milling operations	unknown	unknown	alleged facilities in Yazd province
Nuclear materials	planned	LEU fuel rods for VVER-1000 reactor	Novosibirsk Chemical Concentrate Plant	Minatom	Bushehr Nuclear Power Plant
	unknown	2,000 tons of natural uranium	unknown	Minatom	unknown
Training and know-how	ongoing	training for physicists and technicians	n/a	Kurchatov Institute and Novovoronezh Nuclear Power Plant	Bushehr Nuclear Power Plant

Table 1: Russian Nuclear Exports to Iran

Power Reactors

In January 1995, Russian Minister of Atomic Energy Viktor Mikhailov and the head of the Atomic Energy Agency of Iran, Reza Amrollahi, signed an \$800 million contract calling for Russia to complete the first unit of an unfinished nuclear power station at Bushehr by installing a 1,000 MW VVER-1000 light-water reactor at the site within four and one-half years.¹² Construction of a nuclear power station at Bushehr had been started in 1974 by the German firm Siemens as part of the Shah's nuclear program. However, work stopped after the Iranian Revolution of 1979, and the site was heavily damaged by bombing during the 1980-88 Iran-Iraq war. Iran tried to find a contractor to finish the plant during the 1980s, but failed because of US pressure on possible suppliers. Amrollahi and Mikhailov also signed a secret protocol to the contract on January 8, 1995, some terms of which were later revealed by US intelligence sources. Under this protocol, Russia agreed to open negotiations on providing Iranian specialists with training at Russian nuclear research centers, assisting Iran's efforts to mine uranium, and supplying Iran with a gas-centrifuge uranium enrichment facility. The protocol also discussed the possibility of Russia providing Iran with 2,000 MT of natural uranium and a research reactor.13 In August 1995, Russia and Iran signed a 10-year contract under which Russia would supply nuclear fuel, fabricated at the Novosibirsk Chemical Concentrate Plant, for the Bushehr plant.14

While the United States expressed concern about the proliferation implications of the proposed power reactor, many of the projects listed in the secret protocol raised additional alarm, since they could contribute even more directly to the suspected Iranian nuclear weapons program. The centrifuge enrichment plant was particularly disturbing, as the equipment and technology used in the plant could be applied to the production of weapons-grade highly enriched uranium. Under pressure from the United States, Russian President Yeltsin announced at a May 1995 summit meeting with President Clinton that export of the centrifuge plant would be cancelled.¹⁵

Future Plans for Power Reactor Exports

In March 1996, Russia's ambassador to Tehran, Sergey Tretyakov, said that Russia may help Iran build other nuclear power stations once Bushehr is completed. He suggested that US concerns over this cooperation were "the problem of the United States, not of Russia."¹⁶ In Tehran on March 6,1998, Russian Deputy Prime Minister Vladimir Bulgak concluded a preliminary deal for the construction of two additional reactors at Bushehr. During a November 1998 visit to Iran, Minister of Atomic Energy Yevgeniy Adamov said that the construction of three additional reactors was under study.¹⁷

Research and Other Reactors

In December 1998, press articles citing US intelligence sources reported that Russia's Scientific Research and Design Institute of Power Technology (NIKIET) and another nuclear research institute (probably the Mendeleev University of Chemical Technology) were negotiating to sell a 40 MWt heavy-water research reactor to Iran. In January 1999, the United States announced sanctions against these two institutions and the Moscow Aviation Institute. According to initial reports, negotiations over the sale had been ongoing for more than six months, and while no equipment for this reactor had been shipped, personnel and blueprints had been exchanged. The reports also raised concerns about the personal involvement of Minister of Atomic Energy Adamov in the transaction, as Adamov served as Director of NIKIET until his appointment as Minister in 1998.¹⁸ This type of reactor would significantly increase Iran's capability to produce plutonium for a nuclear weapons program, as it is estimated that Iran is at least ten years away from developing the required technology without Russian support. In the words of US nonproliferation expert Gary Milhollin, "If Iran succeeds in importing a research reactor like this, it will open the way to making a bomb."19

The January 1995 contract signed by Mikhailov and Amrollahi originally included an agreement to provide Iran with a 30 to 50 MWt light-water research reactor, but this aspect of the deal was subsequently cancelled.²⁰ (Note that this deal involved a light-water reactor, not the heavy-water reactor reportedly under negotiation in December 1998.) On April 6, 1998, Yevgeniy Adamov, recently appointed minister for atomic energy, said that Minatom would like to supply Iran with a research reactor, which would run on fuel enriched to less than 20 percent in accordance with IAEA recommendations. He reported that a contract for the sale of the reactor had been drafted in 1996, but awaits approval by both governments.²¹ Adamov downplayed US concerns about Iran's nuclear program by joking that he did not want the recent signals of a potential thaw in relations between Washington and Tehran "to end in 15 years at the political level with the US delivering a research reactor with, say, 90 percent enrichment or exactly the same fuel that is used in weapons."²² Adamov acknowledged in December 1998 that he was personally lobbying the Kremlin for permission to export the light-water reactor.²³ There are reports that, in January 1995, Mikhailov and Amrollahi also discussed a potential deal to construct an APWS-40 nuclear desalination plant, to be manufactured by the Experimental Machine Building Design Bureau (OKBM), but the status of this project is unknown.²⁴

Uranium Enrichment, Mining, and Milling

In December 1998, press articles citing US intelligence sources reported that NIKIET and the Mendeleev University of Chemical Technology were negotiating with Iran over the sale of a facility to convert uranium into uranium hexaflouride (UF6) for subsequent enrichment. US nonproliferation experts stated that this sale, if carried out, would significantly upgrade Iran's capability to enrich uranium for possible use in nuclear weapons.²⁵

The secret protocol on nuclear cooperation signed in January 1995 reportedly included an agreement to provide Iran with a gas-centrifuge uranium enrichment facility.²⁶ The United States strongly objected to this provision of the agreement, and at the May 1995 summit meeting in Moscow with President Bill Clinton, Russian President Boris Yeltsin announced that the centrifuge export deal had been cancelled. Russian officials, however, denied that the deal had ever existed.²⁷ In July 1997, US intelligence sources reported that Russia was advising and assisting Iranian efforts to mine uranium ore in the Saghand region of Yazd province. Russia initially denied these reports,²⁸ but in November 1998, Mikhailov confirmed that Minatom had designed a small-scale (100 to 200 MT/year) uranium mine for Iran.²⁹ Iran has no known facilities for uranium mining or milling on a significant scale. There are allegations that secret facilities for this purpose exist in Yazd province, but these have not been substantiated in the opensource literature.

Nuclear Materials

In August 1995, Russia contracted with Iran to supply low-enriched uranium (LEU) fuel for the Bushehr nuclear power plant for 10 years. The fuel rods for the VVER-1000 light-water reactor will be fabricated at the Novosibirsk Chemical Concentrate Plant.³⁰ The secret protocol to the January 1995 Russo-Iranian nuclear cooperation accord reportedly discussed the possibility of Russia providing Iran with 2,000 MT of natural uranium. The intended recipient of this material, as well as the status of this aspect of the agreement, is unknown.³¹

Nuclear Training and Know-How

The protocol to the January 1995 contract between Minatom and the Atomic Energy Agency of Iran reportedly opened negotiations on Russian training for Iranian nuclear specialists.³² In March 1996, the Russian press reported that Iranian physicists and technicians for the Bushehr nuclear power plant would be trained at the Kurchatov Institute and the Novovoronezh Nuclear Power Plant.³³

IMPLICATIONS FOR NUCLEAR NONPROLIFERATION

Russia cancelled its most worrisome nuclear export to Iran—the gas centrifuge plant—only after diplomatic pressure was applied at the highest levels. It remains to be seen at the time of this writing whether the export of a heavy-water research reactor will similarly be cancelled. The need for continued, high-level political pressure to prevent the export of technology that could rapidly increase Iran's capability to produce weapons-usable nuclear material raises troubling questions about the commitment of Russia's government and nuclear industry to nuclear nonproliferation.³⁴

The possibility that Iran will use the Bushehr reactor directly in its nuclear weapons program, although remote, cannot be ruled out. The VVER-1000 reactors to be installed at Bushehr will generate spent fuel containing more than 180 kg of plutonium per year, which could be used to build a primitive nuclear device.³⁵ In addition, if the rate of fuel burnup in the reactors were reduced, the reactor could produce a significant quantity of weapons-grade plutonium, which would raise serious concerns if Iran were to exit abruptly from the Non-Proliferation Treaty, as North Korea threatened to do in 1993.

The disposition of spent fuel from the Bushehr reactor deal raises additional proliferation concerns. Russian officials have insisted that, in accordance with standard practice for reprocessing of spent fuel from Soviet-designed reactors outside Russia, the fissile material resulting from the reprocessing of spent fuel will be retained in Russia while the high-level waste will returned to Iran.³⁶ (Russian environmental laws currently prohibit the return of spent fuel from reactors outside of the former Soviet bloc states of Eastern Europe, but these laws may be amended in the near future.³⁷ Russia is also building reprocessing and long-term storage facilities for spent fuel from VVER-100 reactors at the RT-2 Reprocessing Plant at Zheleznogorsk [Krasnoyarsk-26] in Siberia, but as construction has been suspended due to insufficient funds and environmental concerns, it is not certain when or if these facilities will be completed.³⁸) If the fissile material from the spent fuel is stored safely and securely in Russia, it would not raise significant proliferation concerns; however, if Iran were to exit from the NPT, it could refuse to return the spent fuel.

Apart from the cancelled gas centrifuge plant and the research reactor reportedly under negotiation, the most serious concerns over Russia's nuclear exports to Iran arise from the continued provision of training and knowhow. The Kurchatov Institute and the Novovoronezh Nuclear Power Plant will continue to train Iranian physicists and technicians for the Bushehr plant.³⁹ Collaborating with Russian experts will greatly increase the knowledge of Iranian nuclear specialists and improve their access to aspects of Russian nuclear technology. Moreover, Russian-Iranian nuclear cooperation could provide cover for and otherwise facilitate illegal transfers of nuclear technology. Overall, Minatom's enthusiastic promotion of exports of nuclear technology, fuel, and training to Iran suggests that either the Russian government has decided that the financial benefits of nuclear exports outweigh the resulting risks of nuclear proliferation, or that elements of the government that give priority to nonproliferation lack the clout to overrule those that give priority to exports.

OVERVIEW OF MISSILE EXPORTS

The Russian government insists there has been no significant transfer of missile technology to Tehran, although it admits that Iran has actively tried to acquire Russian technology and that some individual Russian specialists may have worked in the Iranian missile program. The more serious allegations of unlicensed exports involve guidance and engine components, highstrength steel and special alloys, and manufacturing and test equipment. Additionally, two Russian defense firms are known to have sent specialists to Iran, and reports indicate Iranian students have received training in missile technology at Russian technical institutes.

It should be noted that many reports of Russian transfers of missile technology or materials often quote unnamed US or Israeli intelligence sources. While this should not lead one to discount the reports automatically, the possibility that reports relying on such sources may be politically motivated should be kept in mind. In any event, Russia has never officially acknowledged any legal exports of missile components or related equipment to Iran.

Missile Propulsion Components

In September and October 1997, articles in the Western press reported that the scientific production associations Trud (located in Samara) and Energomash transferred technology related to the RD-214 rocket engine, used in the SS-4 medium-range ballistic missile, to Iran.⁴⁰ Russian officials, including President Boris Yeltsin and Prime Minster Viktor Chernomyrdin, quickly denied these reports.⁴¹

Sources also report that the Russian firm Samara State Scientific and Production Enterprise-NK Engines (affiliated with NPO Trud) received engineering drawings for turbopump components from an Iranian concern and contracted to produce the requested parts. Soon after NK Engines received additional technical information about the parts from their Iranian customers, they realized that the parts were for a rocket engine, most likely the RD-214, and applied for an export license. The application was rejected, the parts were not sent to Iran, and the Russian Federal Security Service (FSB) seized all documents relating to the cancelled transaction.⁴²

Missile Guidance Components

In 1996, press reports citing US intelligence sources stated that the Inor Production Association had contracted to provide Iran with lasers and mirrors used in missile guidance systems, as well as other components, materials, and manufacturing equipment.⁴³ According to press reports in September and October 1997 that cited Israeli intelligence sources, the Polyus Scientific Research Institute (located in Moscow) also supplied missile guidance components to Iran.⁴⁴ Inor and Polyus were placed under special investigation for violation of Russian export control laws in July 1998 and subjected to US sanctions by executive order that same month.⁴⁵

Category	Status	Export	Manufacturer	Exporter	Recipient
Materials and components	intercepted	21 tons of maraging steel	unknown, possibly Inor Production Association	MOSO and Yevropalas 2000	unknown
	intercepted	composite material used for ballistic missile warheads	NII Grafit	unknown	unknown
	cancelled	turbopumps for RD- 214 (SS-4) liquid - fuel rocket engine	Samara State Scientific and Production Enterprise-NK Engines	Samara State Scientific and Production Enterprise-NK Engines	unknown
	alleged	components of RD- 214 (SS-4) liquid - fuel rocket engine	NPO Trud and NPO Energomash	unknown	unknown
	alleged	unspecified missile guidance components	Polyus Scientific Research Institute	unknown	unknown
	alleged	620 kg of special alloys and foils	Inor Production Association	Rosvooruzheniye	unknown
Manufacturing and testing equipment	alleged	wind tunnel and related facilities	Russian Central Aerohydrodynamic Institute (TsAGI)	Rosvooruzheniye	unknown
	alleged	unspecified missile manufacturing equipment	Inor Production Association	Rosvooruzheniye	unknown
	alleged	measurement equipment used in rocket engine tests	NPO Trud	unknown	unknown
Training and know-how	suspended	training of Iranian students in missile design	n/a	Baltic State Technical University and Moscow Aviation Institute	Sanam Industries Group
	suspended	missile specialists traveled to Iran under false documents	n/a	Komintern Plant, Tikhomirov Institute	unknown
	unknown	training of Iranian students in missile design	n/a	Bauman Moscow State Technical University	unknown
	unknown	suspected transfer of dual-use technology	n/a	Glavkosmos	unknown
	alleged	recruitment of Russian experts to work on Iranian missile projects	n/a	Federal Security Service (FSB)	unknown

Table 2: Russian Missile Exports to Iran

Missile Materials

A May 1997 US press report stated that the Inor Production Association had contracted to provide Iran with maraging steel, a high-strength steel used in missiles and other high-stress applications. Later reports charged that Inor had supplied Iran with 620 kg of special metal alloys and shielding foil.⁴⁶ On March 26, 1998, Azerbaijani customs officials seized 21 MT of high-strength steel sheets en route to Iran. Western sources described this material as maraging steel, suitable for use in missile fuel tanks or solid-fuel missile casings, and implicated the Russian companies Yevropalas 2000 and MOSO in the illicit shipment. One press account reported that although US intelligence officials had tipped off their Russian counterparts of plans to make the shipment, this information was not relayed to Azerbaijani officials, who only seized the steel because of irregularities in shipping documents.⁴⁷ The chance seizure of the shipment therefore raised concerns on the efficacy of Russian export controls, but FSB public relations chief Aleksandr Zdanovich later downplayed the incident, reporting that the steel was of a type "used everywhere for household needs," for which no special export license was required.⁴⁸ Ludmila Khromova, president of Inor, and representatives of other organizations accused of supplying missile materials to Iran said that their exports to Iran were made with the full knowledge of the Russian government.⁴⁹ Nevertheless, Inor, Yevropalas 2000, and MOSO were placed under special investigation for suspected violations of Russian export control laws in July 1998.⁵⁰ It should be noted that while maraging steel is a dual-use commodity with many industrial applications, it is also an important component in the gas centrifuges used for uranium enrichment in Iraq and Pakistan.⁵¹ It is therefore difficult to determine whether the sheets of Russian maraging steel intercepted in Azerbaijan were intended for use in Iran's missile program, nuclear program, or civilian industry.

In April 1998, a *New York Times* article reported that the Grafit State Scientific Research Institute (NII Grafit), an institute in Moscow that developed graphite-based materials and composites used in ballistic missiles and the nosecone of the *Buran* space shuttle, attempted to ship material used for ballistic missile warheads to Iran, but the material was intercepted in transit in Austria.⁵² The interception of this shipment, which again cast doubt on the effectiveness of Russian controls on the export of dual-use materials, undoubtedly resulted in the inclusion of the Grafit Institute on a July 1998 list of institutions suspected of violating Russia's export control laws, leading to subsequent US sanctions.⁵³

Missile Manufacturing and Test Equipment

A report in May 1997, citing US intelligence sources, said that the Russian Central Aerohydrodynamic Institute (TsAGI) and Rosvooruzheniye, the Russian state arms export company, had signed a contract to construct a wind tunnel and related facilities for the Iranian missile program, and that the Inor Production Association had agreed to supply manufacturing equipment (as well as missile components and special materials) in the same \$150,000 contract.⁵⁴ Later reports alleged that that Yuriy Koptev, head of the Russian Space Agency, and at least one top official of Rosvooruzheniye were directly involved in Russian cooperation with Iranian missile-development efforts.⁵⁵ Rosvooruzheniye and Russian Space Agency spokespeople categorically denied these reports, but Inor was later placed under special investigation for violation of Russian export control laws and penalized with US trade sanctions.⁵⁶ In December 1997, US intelligence agencies revealed that Iran tested a medium-range ballistic missile engine using measurement equipment supplied by NPO Trud. No further details were given on the specific equipment used, or on when, where, or to whom the equipment was provided.57

Missile Training and Know-How

In 1997, Iranian students from the Sanam Industries Group, one of the leading organizations in Iran's ballistic missile program, reportedly received training in missile design at Baltic State Technical University in St. Petersburg and at Bauman Moscow State Technical University.⁵⁸ In April 1998, reports stated that Iranians may be receiving training in missile propulsion and guidance technology at the Moscow Aviation Institute.⁵⁹ In July 1998, the Russian Government Commission on Export Control placed Baltic State Technical University under "special investigation" for suspected violations of Russian laws governing the export of dual-use commodities connected with weapons of mass destruction and missile systems.⁶⁰ Training for the Iranian students at Baltic State was halted that same month (July 1998). Yuriy Saveley, Rector of the Baltic State Technical University, has denied that his institution assisted the Iranian missile program, saying that the 25 Iranian students who studied at his university under a joint program with the Iranian Sanam College took only classes that fell within "the Russian general educational engineering program," and that the program for the Iranians at the university was cancelled only because Sanam's activities in Russia had been shut down for reasons of national security, not as a result of any specific violation of Russian regulations.⁶¹ The current status of the training programs at Bauman State Moscow Technical University and the Moscow Aviation Institute is unknown, although the Russian Federal Security Service said in July 1998 it had halted "unsanctioned activity by a group of specialists from the Moscow Aviation Institute working on missile technology." Nonetheless, the United States applied sanctions to the Institute in January 1999.⁶²

On July 13, 1998, Nikolay Kovalev, Director of the FSB, stated that his agency had discovered that the Komintern Plant in Novosibirsk and the Tikhomirov Institute near Moscow had sent missile specialists to work in Iran via Tajikistan, using false travel documents to circumvent travel regulations.63 The Komintern Plant and Tikhomirov Institute were subsequently placed under special investigation of violation of Russian export control laws.⁶⁴ Glavkosmos, an organization subordinate to the Russian Space Agency specializing in the management of commercial space projects, was placed under Russian investigation and US trade sanctions in July 1998 for suspected violations of export control laws and transfer of technology related to ballistic missiles to Iran.⁶⁵ The specific assistance that Glavkosmos allegedly provided to the Iranian missile program, however, is not known.

In March 1998, an article in Russia's Novaya gazeta, which included an interview with a Russian specialist whom Iranian agents had attempted to recruit, suggested the possible deliberate acquiescence, or even active involvement, of the Russian Federal Security Service in recruitment of Russian experts for work on Iranian missiles.⁶⁶ Soon afterward, an article in the Washington Post, citing "Russian and diplomatic sources," reported that the FSB had quietly recruited Russian missile experts for work in the Iranian missile program. According to this report, once the specialists were recruited, they negotiated their own contracts with Iran, in order to allow the Russian security agency and the Russian government to deny involvement in the deals. The article also cited a Russian official as saying that the government now intends to stop the practice and restrict travel to Iran by Russian experts.⁶⁷ The scope and recipients of these alleged FSB efforts, and their relationship, if any, to FSB enforcement of Russian export controls, cannot be determined.

IMPLICATIONS FOR MISSILE NONPROLIFERATION

The July 1998 report of the Rumsfeld Commission, appointed by Congress to assess the ballistic missile threat to the United States, concluded that Iran's missile programs had "benefited from broad, essential, long-term assistance from Russia," which had "allowed Iran's missile programs to proceed swiftly." The report specifically mentioned the acquisition of designs and components for the RD-214 engine as giving Iran "major, advanced missile components that can be combined to produce ballistic missiles with sufficient range to strike the United States."68 Additionally, reports and commentary in the Israeli press charged that Russian technology was incorporated into the Shahab-3 missile that Iran tested in July 1998.⁶⁹ Iranian officials, however, denied that Russia cooperated with Iran in production of the missile, and Iran's defense minister further claimed that the Shahab-3 was developed "without help from any foreign country."⁷⁰ This claim, however, is fallacious; most experts agree that the Shahab-3 is essentially a North Korean Nodong medium-range ballistic missile with few, if any, modifications.⁷¹ Nevertheless, the possibility remains that Russian technology or know-how may have been used to enhance the performance of the Shahab-3, or to enable Iran to manufacture some components domestically.

Russian officials have repeatedly insisted that Russia is fulfilling its obligations under the Missile Technology Control Regime (MTCR), and President Yeltsin has "categorically denied" US allegations of supplying Iran with missile components and technologies.72 In January 1999, Yeltsin announced tighter controls on missile technology exports, but did not name any items added to Russia's export control list.⁷³ In July 1998, the Russian Government Commission on Export Control launched an investigation of nine companies and institutions suspected of violating Russian export control laws. This list, however, did not include several large and influential organizations-including the Russian Space Agency; Rosvooruzheniye, the state-owned arms export company; and the Federal Security Service-that Western and Israeli sources have charged with complicity in covert transfers of Russian missile technology to Iran.⁷⁴ Under pressure from the US Congress to take action, the Clinton administration penalized seven of these companies with trade sanctions.⁷⁵ The United States has threatened to eliminate Russian launches of US-made satellites, and possibly to reduce other US aid to Russia, until Russian organizations cease their cooperation with Iran's ballistic missile program.⁷⁶

Information available from open sources does not resolve whether transferring missile technology to Iran is an official policy, or merely an activity carried out by individual companies, possibly in collusion with corrupt officials. Nevertheless, credible reports continue to suggest that the Russian government has either turned a blind eye to the activities of Russian defense firms in this area or has actually assisted their efforts. The deleterious effects of the continuing economic crisis on Russia's defense industry raise further concerns about the possibility of Russian government involvement at some level as well as about lax enforcement of export controls. Revelations of a 1995 sale of Russian missile guidance components to Iran's neighbor, Iraq, reinforce the concerns about enforcement of Russian export controls.⁷⁷ Recent efforts to strengthen Russia's export control policies are certainly welcome. Nevertheless, the record of clandestine transfers of missile components and technology to Iran demonstrates that Russia's commitment and ability to control the proliferation of ballistic missile technology remain problematic.

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