
The Russian-Iranian Partnership: Technology, Trade, and a Marriage of Convenience

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INTRODUCTION

After the 1979 Revolution, American policymakers mainly focused on how Washington must deal with the loss of Iran. From a different perspective, however, Iranian leaders asked how Tehran should deal with the loss of American technical support. One answer to such question came from shifting balance of political, economic, and technical relations between Iran and the Russia. The growing strength of Tehran-Moscow ties coincided with the decreasing level of Usa leverage in Iran. The main questions are: Are Tehran-Moscow ties tactical or strategic in nature? What theory (the Natural Ally or the Marriage of Convenience) explain their close technical cooperation?

The objective of this research is to examine the implications of Iranian- Russian trade and cooperation in the high tech areas of missile, satellite, and nuclear technologies. The government of the Islamic Republic of Iran (Iri) aims to fill the gaps produced by the lack of Western technology and to become an undisputed regional power. Mastery of high technology is seen as a key step toward fulfilling such goals. Thus, cooperation with Russia makes

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sense for Iri. From the Russian perspective, Moscow seeks to reclaim its role as a global power (diminished during the 1990s), so ties with states like Iri, which challenges the Usa, adds to Russian global influence.

The news media often reports about cooperative relationship between Moscow and Tehran on technology trade. In fact, nuclear cooperation between these two States, especially about the Bushehr reactor, is well documented². In comparison, less attention is paid to Iranian missile and satellite programs (space program). In the last two decades, Moscow has been a major partner in Iri technological development, having assisted Tehran with the launch of a satellite and providing the basic technology on which Iranain long range Shahab-3 rocket family is based³. The hope is that this analysis of Russian-Iranian technological cooperation for all three areas (of missiles, satellites, and nuclear technology) provides an important addition to the literature.

One major dimension of Russian-Iranian technological cooperation is its geopolitical implications. This research seeks to addresses many important questions: what are Tehran and Moscow's reasons for cooperating, and what does each country wish to gain of their partnership? What are the policy options of the Us (and the West) in deterring Iran? Which options have (and have not) worked in dealing with Iran? And finally, what are the geopolitical implications of such ties?

Methodologically, the paper begins by presenting a historical analysis of the Iranian missile, satellite, and nuclear cooperation in association with Russia. Then, estimates of Russian-Iranian cooperation are presented. Finally, there are a few observations about the implications of the Russian-Iranian relationship and cooperation for the West, and more specifically the Us.

Before the analysis begins, however, it is important to emphasize that space operations are generally considered to be the endeavors of great powers, with Russia, the Usa, China, and Europe at the top, regularly launching astronauts. However, minor space powers also exist; and these are primarily the countries that can effectively launch their own satellites into orbit, usually for national

² *Bushehr – Background*, GlobalSecurity.org, <http://www.globalsecurity.org/wmd/world/iran/bushehr-intro.htm>, 28 April 2005.

³ J. B. SHELDON, *A Really Hard Case: Iranian Space Ambitions and the Prospects for Us Engagement*, «Astropolitics», August 2006, Volume 4, Issue 2, pp. 229-251.

security and international prestige purposes. The ways in which minor powers utilize space and the problems they encounter managing space programs are important to consider as they are the experiences most countries will have in trying to develop space programs.

The Iri is currently working toward becoming a minor space power, recently launching its first satellite into orbit. It is also in a unique situation in combining its space efforts under a rubric of high technology mastery with what many believe to be a nuclear weapons program. In its efforts to grow a domestic capacity for these programs Tehran looks to foreign assistance, especially from Moscow. For Russia, cooperation with Iran provides an ally in its rivalry with the Usa. This way, the technology cooperation between Iran and Russia can be seen as both pragmatic and symbiotic.

THE DYNAMICS OF BALANCING

The technology trade between Tehran and Moscow is part of a larger system of balancing that primarily stems from the Russian point-of-view. After the fall of the Ussr, Russia tried to partner with the West in a relationship where it felt it was treated as a junior partner. Moscow felt uneasy with Usa unilateralism especially in the run-up to war in Iraq. Moreover, the Kremlin has been downright livid at Western encroachment into the former Soviet space in the form of Nato enlargement and a possibility of the Us led anti-ballistic missile shield programs in Eastern Europe.

Beginning with the leadership of former Russian President Vladimir Putin, Russia has sought to regain its lost role as a global power using energy revenue. Part of this strategy is to form alliances that balance against the power of the Usa (and the West) with a Newtonian action-reaction dynamic where choices on one side directly provoke an opposite response from the other with the goal of equalizing forces. Iran, as a country that resists Western influence makes an ideal junior partner for Moscow. A part of its soft balancing strategy is Russian support for Iran because Iri is seen as a thorn in the side of the Americans. For Iran, Russian support is a necessity to build up its capacity, and so its eyes are always aimed at the future when Iran can only rely on itself. The Iranian-Russian partnership is not unconditional but based on pragmatism practiced by both States. In short, it is a marriage of convenience. Russia does not want Iri to become a future threat, and Iran does not want to be under the thumb of any foreign power.

This type of symbiotic link is bound rather tightly with the foreign policy decisions of the Usa (and the West). In sum, disappointed with the results of its alliance with the West and free from the Chechen war burden, Russia looks for new regional partners to

protect its security and re-acquired influence. Such disappointments as well as shared economic interests turn the Russian diplomacy vector to the east and especially to States (like Iran) that resist American influence. Contrary to the pattern established by the Cold War era, this new turn in Moscow's foreign partnership is a pragmatic one. The Kremlin prefers predictable and ideally junior partners in its quest for global status and power politics. If Moscow cares about Iran, it does not mean that Russia will support policies which can be potentially harmful for its own national interests.

On the other side, Tehran chose to work with Moscow despite its reservations about the nature, scope, and functions of Russian foreign policy in the globe and region. The Iri recognizes that Russian Federation may be using it as a pawn in a global chess game where the other side is the Usa. The policy cost-benefit calculation of Tehran leads it to opt for cooperation with Moscow, especially for the badly needed access to high technology (missile, satellite, and nuclear programs) free from Western influence. From the Iranian perspective, our discussion also indicates that Tehran-Moscow cooperation is for practical, not ideological reasons.

THE IRANIAN MISSILE PROGRAM

The Iranian space program is, in many ways, an enigma to foreign powers. Like many other national space programs, it is tied heavily into the country's military and national security apparatus. There is great difficulty in pinpointing exactly where a ballistic missile program ends and a space launch program begins, and the international community fears that this ambiguity is one of the reasons Iran is interested in running a space program⁴. Space operations provide an excellent cover for a ballistic missile program. However, if this is indeed Iran's intention, it is not the only country to utilize this association in this way. Many world leaders believe that along with its space ambitions, Iran is seeking to control the nuclear fuel cycle and the ability to manufacture nuclear warheads. The deployment of nuclear armed long range ballistic missiles by Iran is a reality the Usa and others are desperately trying to prevent.

According to the Iranian leaders, their emerging space program is not a threat to the international community, but it is a necessity

⁴ S. ABBOT, A. A. DAREINI, *Some Fear Iran's Space Program is Hostile*, «The Associated Press» (accessed on GlobalSecurity.org), <http://www.globalsecurity.org/org/news/2007/070305-iran-space.htm>, 5 March 2007.

to protect Iran from its enemies. A 2002 statement from the head of the Iranian Aerospace Industries Organization (Aio), Ahmad Vahid Dastjerdi, claimed that Iranian missiles are for protection from Israel⁵. The Iranian government has continuously stated its nuclear program is only for energy generation and not for the creation of weapons; and its space program exists only for launching and operating telecommunications and remote sensing satellites for peaceful purposes. Thus, the space and nuclear programs serve to provide all those benefits that are seen from Iranian political or nationalistic perspectives on space: national security, international prestige, and enhanced power.

One facet of the Iranian space program is its launch vehicle technology, growing out of its ballistic missile program which gained importance during the 1980-1988 war against Iraq. The Shahab-1 and Shahab-2 were created as variants of Scud-B and Scud-C missiles using parts and expertise gained from relationships with Libya, Syria, China, Russia, and North Korea. In 1997, Russia even arrested an Iranian diplomat who had tried to purchase missile designs and technology⁶. Finally, in 1998, Iran developed the Shahab-3 which would see two variants, 3M (or 3A) and 3D, allowing for improvements in guidance and range.

The original configuration of the Shahab-3 has a range of 1100 to 1300 km and carries a 1,200 kg payload. Iran claims that the Shahab-3 has a range of 1300-2000 km but these figures may take the missile's variants into account or may simply have been invented by Iri, which has a habit of overstating its military abilities.

The main variant is known as the Shahab-3A (or Shahab-3M). Not a lot is known about the differences in these missiles, as Iran has tested Shahab-3 missiles with varying lengths, warhead sizes, and ranges. The core difference between the modified Shahab-3M and the original is the use of a spin-stabilized 'baby-bottle' warhead design which allows for more advanced types of warheads to be integrated into the missile.

It should also be noted that some sources list the Shahab-3 family as using engines that run on the fuel, unsymmetrical dimethylhydrazine (or Udmh). It could be that Iran is experimenting

⁵ *Missile Project Chief Interviewed*, «Info-Prod Research» (Middle East), 6 October 2002.

⁶ *Russia Arrests Iranian Seeking Missile Data*, «The New York Times», <http://query.nytimes.com/gst/fullpage.html?res=9D01E4DF1238F936A25752C1A961958260>, 15 November 1997.

with various fuel/oxidizer mixtures. In 2003 the South African company Sasol sold 120 metric tons of dimethylamine to Iran, a precursor chemical for Udmh and also the nerve agent Tabun. A German company, Tira, also sold Iran rocket parts for the Shahab-3 from 2002-2004. These efforts would produce significantly more advanced missiles.

In July 2008, Iran test fired nine Shahab-3 missiles as well as other shorter-range missiles in a war game known as Great Prophet III. It was discovered after the tests, however, that Iran doctored images of the missile launches to show successful launches where failures actually occurred⁷.

The Shahab-3, whose current variants represent the mainstay for Iranian missile technology, were based on the North Korean Nodong-1, itself a Russian Scud variant and whose development relied on Iran as a partner. Since the Shahab-3 entered service in 2003, Iran has, in development and testing, various missiles that represent improvements in many areas of missile technology.

Range is the factor that Iran has consistently worked to improve. The Scud missile family that served as the basis for Shahab is known to be highly inaccurate, especially at long distances, and improvements in the Shahab-3 variants were meant to improve accuracy. Starting in 1999, the Iranian government announced the development of the Shahab-4, and various announcements have painted the missile as possessing very different qualities. The missile has been described as an Medium Range Ballistic Missile (Mrbm) with a range of 1800-2000 km, on par with the Shahab-3, an Intermediate

⁷ The following data sources were used: A. H. CORDESMAN, *Iran's Developing Military Capabilities*, «Center for Strategic and International Studies Press», 2005, Significant Issues Series, Volume 27, Number 4; A. H. CORDESMAN, M. KLEIBER, *Iran's Military Forces and Warfighting Capabilities*, «Praeger Security International», 2007; Encyclopedia Astronautica, <http://www.astronautix.com/>; general information on Iranian missiles used *German company sold missile technology to Iran*, «IranPressNews» (sourced from «Der Spiegel»), <http://www.iranpressnews.com/english/source/004657.html>, 1 May 2005; *Iran's Ballistic Missile Program*, «Iran Watch», <http://www.iranwatch.org/wmd/wmd-iranmissileessay.htm>, August 2004; *Iran 'Faked Missile Test Image*, Bbc News, http://news.bbc.co.uk/2/hi/middle_east/7500917.stm, 10 July 2008; *Iran sends missile test warning*, BBC News, http://news.bbc.co.uk/2/hi/middle_east/7496765.stm, 9 July 2008; INTERNATIONAL INSTITUTE FOR STRATEGIC STUDIES, *Iran's Strategic Weapons Programmes*, Routledge Publishing, 2005; W. W. K. NGOBENI, *How Sasol firm sold Wmd chemicals to Iran*, Mail & Guardian Online, <http://www.mg.co.za/article/2005-02-18-how-sasol-firm-sold-wmd-chemicals-to-iran>, 18 February 2005.

Range Ballistic Missile (Irbm) or Inter-Continental Ballistic Missile (Icbm) with a much greater range, and a Space Launch Vehicle (Slv) with no military application. When Iran claims to be creating an enhanced missile, in any way, it is generally thought to be the Shahab-4 (with Shahab-5 and Shahab-6 being mentioned occasionally).

Another missile technology that Iran hopes to master is the use of solid fuel engines. Iran's ballistic missile program has traditionally favored liquid-fuel engines. The benefits of liquid propellants over solid consist of higher specific impulses, and an engine that can be throttled and turned off and on during flight. Liquid propellants are cheaper than solids and fuel tanks can be made of lighter materials. Liquid systems, however, have two major issues. One is that engines are much more complicated with many parts. The other is that the liquid chemicals used as fuels and oxidizers are dangerous to store and the missile cannot be stored and transported with the propellants inside. For military purposes this means that the missiles must be set-up and fuelled before launch, a process that can take time. Solid-fuel missiles offer the benefits of a faster launch time since they can be transported with the engine installed. Once a solid-fuel engine is ignited, though, it must burn to completion⁸.

The Scud and its direct derivatives utilize liquid fuel engines which allow for greater efficiency, control, and lifting power than solid fuel missiles would allow. Solid fuel missiles, however, can be prepped and launched in a fraction of the time that it takes to launch using liquid fuel. For military purposes, the short launch time of solid fuel missiles is a huge advantage as it gives much less time for the enemy to determine a launch has been made and initiation of a defense. Later Shahab-3 variants and the Ghadr use stages that included both liquid and solid fuel, and the Ashoura, announced in 2007, use only solid fuel.

Iran also announced in 2006 the development of Fajr-3. The missile has an unknown range, but has two advanced capabilities: radar and anti-missile avoidance, and Multiple Independently Targeted Re-entry Vehicles (Mirv) technology in that it contains multiple warheads on one missile. Iran's growing fleet of missiles is linked closely with those of North Korea, whose technology is based

⁸ The following data sources were used: CORDESMAN, *Iran's Developing Military Capabilities*, cit.; CORDESMAN, KLEIBER, *Iran's Military Forces and Warfighting Capabilities*, cit.; *Iran's Ballistic Missile Program*, cit.; *Iran's Strategic Weapons Programmes*, cit..

on Russian know-how. Both countries have traded material, knowledge, and resources, and it is believed that this relationship continues. It is also assumed that North Korea tried to launch a Taepodong-2 in 2006 and that the test failed. This missile would have the range of an Icbm and if the project is ultimately successful, it could enhance Iran's strategic missile range greatly. In October 2007, Iran claimed another technical feat for its missile program: the ability to launch 11,000 missiles at enemy bases within the first minute of an attack⁹.

Finally, in early February 2008 (and possibly in late 2007 although the launch is unconfirmed), the Iri launched its first sub-orbital sounding rocket that reached the edge of space. Known as Kavoshgar-1 and reaching an altitude between 200 and 250 km, the enhanced Shahab-3 made Iran a minor space power¹⁰. The immediate response from the White House was to call the launch «unfortunate»¹¹, and Israeli defense analysts downplayed the importance of the launch¹². «The Financial Times» argued that the space launch was simply an avenue for President Ahmadinejad to rally the Iranians to a government that is otherwise known for economic mismanagement¹³. A further satellite launch system test took place on 18 August 2008 with a launch vehicle known as Safir. Finally in February 2009, the Iranian government claimed that it launched Omid aboard Safir-2, gaining the ability to place satellites into orbit. It is unknown if this rocket differs in any way from Safir or if it simply designates a second Safir launch¹⁴.

⁹ *Iran Warns It Can Fire 11,000 Rockets in One Minute if Attacked*, GlobalSecurity.org (Original source: Ria Novosti), <http://www.globalsecurity.org/wmd/library/news/iran/2007/iran-071020-rianovosti01.htm>, 20 October 2007.

¹⁰ C. P. VICK, *Iran's Up-coming First Satellite Launch Attempt & "Kavoshgar" Sounding Rocket & the First Satellite Launch Vehicle "Safire"*, GlobalSecurity.org, <http://www.globalsecurity.org/space/world/iran/first-satellite-launch-attempt.htm>, 25 March 2008 – 12 April 2008.

¹¹ *White House Calls Iran Rocket Launch "Unfortunate"*, «Reuters», <http://www.reuters.com/article/scienceNews/idUSN0455520420080204>, 4 February 2008.

¹² *Israeli Experts Dismiss Iran Rocket; Syria Speeds Up Arms Acquisition*, Bbc Worldwide Monitoring, 5 February 2008.

¹³ *Iran's Space Shot Targets Its Citizens*, FT.com, 4 February 2008.

¹⁴ The following data sources were used: A. COHEN, *The Real World: Iran's Space Rocket Launch*, «Middle East Times», http://www.metimes.com/International/2008/02/08/the_real_world_irans_space_rocket_launch/5566/, 8 February 2008; CORDESMAN, KLEIBER, *Iran's Military Forces and Warfighting Capabilities*, cit.; P. HAFEZI, *Iran says it has put first dummy satellite in orbit*, «Reuters», <http://www.reuters.com/article/worldNews/idUSHAF75296620080817>, 17 August

Operating satellites makes up another part of Iranian space efforts and will be discussed in details in the next section. On 21 August 2008, Iranian State Tv reported that the space program has a goal of launching an astronaut into space within a ten-year time-frame¹⁵. Working toward the goal of safe human spaceflight, despite being in the far future, would spin-off numerous benefits for Iranian ballistic missile program, as well as provide an incredible sense of pride for the Iranian public.

Another issue to highlight is the large number of names and configurations of Iranian missiles. C. P. Vick notes that Iran may be trying to use these names to generate deception about missile capability¹⁶. The naming scheme seems to be relatively sensible, so there are different names of designations for different capabilities. The Iri may not want to disguise the capabilities of their missiles in order not to leak information about advanced capability. On the other hand, the Iranian government seems all too happy to announce when a new capability has been mastered, or even attempted, and usually tends to overstate the potential of its new technology. This may have something to say about the reasoning behind its missile program¹⁷.

Besides the more common Shahab (Scud) series, Iran has experience with other missile systems. Although unconfirmed, it is believed that Iran, in 2006, tested a Bm-25, the North Korean vari-

2008; N. KARIMI, *Iran Test Flies Rocket for Future Satellite Launch*, «Associated Press», accessed at space.com, <http://www.space.com/missionlaunches/ap-080818-iran-rocket.html>, 18 August 2008; N. KARIMI, J. KEYSER, *Iran Claims First Launch of Its Own Satellite*, «Associated Press» (accessed on Abc News), <http://abcnews.go.com/International/wireStory?id=6791750>, 3 February 2009; S. SALAMA, H. OZGUR, *Iran Profile – Missile Chronology*, Monterey Institute of International Studies, accessed on Nuclear Threat Initiative website, http://www.nti.org/e_research/profiles/Iran/Missile/chronology_2008.html, accessed on 4 October 2008; VICK, *Iran's Up-coming First Satellite Launch Attempt & "Kavoshgar" Sounding Rocket & the First Satellite Launch Vehicle "Safire"*, cit..

¹⁵ *Iran Hopes to Send an Astronaut into Space*, «Associated Press», accessed at space.com, <http://www.space.com/missionlaunches/ap-080821-iran-astronaut.html>, 21 August 2008.

¹⁶ VICK, *Iran's Up-coming First Satellite Launch Attempt & "Kavoshgar" Sounding Rocket & the First Satellite Launch Vehicle "Safire"*, cit..

¹⁷ The following general data sources were used: J. S. BERMUDEZ JR., *A History of Ballistic Missile Development in the Dprk, Cns*, <http://cns.miis.edu/pubs/opapers/op2/index.htm>, 1999; Encyclopedia Astronautica, <http://www.astronautix.com/>, general information on Iranian missiles used; MissileThreat.com, <http://www.missilethreat.com/>, general information on Iranian missiles used.

ant of the Russian Ss-N-6. This missile is a submarine launched ballistic missile with a range of 3000 to 4000 km. Iran and North Korea are believed to lack the capability of modifying the missile since its guidance and propulsion systems are fairly complicated.

In 2004, the Neri claimed Iran was working on a solid-fuel Irbm known as Ghadr (Ghadr-101 and Ghadr-110). This may be a variant of the Russian Kh-55 cruise missile, simply another name for the solid-fuel Shahab-3 variant program, or the second stage rocket for a satellite launcher. It is also assumed that Iran uses Kh-55s that it acquired from Ukraine to study missile design. Operating these cruise missiles requires a long-range satellite guidance system that Iran does not have yet.

Finally, in the summer of 2006, Iran helped Hezbollah fire a radar-guided C-802 anti-ship missile, hitting an Israeli warship¹⁸. The C-802 is the export version of the Chinese Yingji-82, a very capable if older anti-ship missile with anti-jamming capability and hard to track. Iran is also believed to have utilized the older Chinese anti-ship Silkworm missile. What this may show, and what some analysts consider, is that Iran now has the capability to become a exporter of missile technology, furthering the proliferation of these weapons¹⁹.

OPERATING AND LAUNCHING SATELLITES

In recent years, Iri has gained experience in operating satellites and moved steadily toward an indigenous launch capability. Iran became a satellite operator in late October 2005 when Sinah-1 was launched into orbit. Tehran's first satellite was built by Npo Polyot, a Russian satellite manufacturer, and launched by Moscow with a fair share of mystery surrounding it. Manufacturing delays set the launch back a month, and the satellite's purpose and capabilities were never fully ascertained. Sinah-1 may have been simply a 'store and forward' communication satellite, and that it may have had up to two cameras with the low resolutions of 50 and 250

¹⁸ R. PLUSHNICK-MASTI, *Israel: Iran Aided Hezbollah Ship Attack*, Cbs News, <http://www.cbsnews.com/stories/2006/07/15/ap/world/mainD8ISKVT80.shtml>, 15 July 2006.

¹⁹ The following data sources were used: CORDESMAN, KLEIBER, *Iran's Military Forces and Warfighting Capabilities*, cit.; R. DERAKHSHI, *Iran Says Has Built New Long-Range Missile*, Swissinfo.ch, http://www.swissinfo.ch/eng/International/detail/Iran_says_has_built_new_long_range_missile.html?siteSect=143&sid=8468167&cKey=1196167087000&ty=ti, 27 November 2007.

meters (or no cameras at all). By Western standards, Sinah-1 was a fairly unimpressive device that some analysts believed that it gave Iran experience in operating a satellite. The Iri leaders speak of the need for satellites for civilian applications such as communications, natural resource location, and weather prediction among others. Whatever its purpose, that Iri satellite was lost relatively soon after being deployed²⁰.

Around the same time as Sinah-1 development, another satellite, Mesbah, was also nearing launch. Mesbah had been in development as a joint project with Italian satellite developer Carlo Gavazzi Space of German satellite manufacturer Ohb System starting in 1997. The satellite resembled a family of German satellites that were developed in the 1990s with simple 'store and forward' communications and no imaging cameras. Mesbah was scheduled to be launched by Russia in early 2006 but its launch seems to have never taken place. Some argue that Mesbah is being held for indigenous launch by Iran itself. Like Sinah-1, Mesbah resembles a family of satellites built in the 1990s that lacked an imaging system. Statements by Iranian officials have also shown that Mesbah is a communications satellite and is not equipped with cameras. The satellite has yet to be launched, but will probably be used for communications and as a test satellite, similar to the function of Sinah-1²¹.

More recently, planning has been done on a project for two more advanced satellites. Named Sepehr and Zohreh (the project itself is also known as Zohreh), it is the reanimation of a project that had begun in the 1970s under the Shah and suffered a long list of starts and stops. The project was not picked up again until 1999 when plans were made with Russia to help build the satellite. Finally, a deal with Moscow in 2005 created some firm plans. Two satellites, Zohreh and Sepehr, will be built by Russian manufacturer Npo Prikladnaya Mekhanika and components from French and German manufacturers. The original deal called for a launch for Zohreh in 2007, but this has been pushed back to 2009. The Zohreh project calls for two micro-satellites with capability to

²⁰ The following data sources were used: L. KASS, *Iran's Space Program: The Next Genie in a Bottle?*, «The Middle East Review of International Affairs», September 2006, Vol 10, No 3, <http://meria.idc.ac.il/journal/2006/issue3/jv10no3a2.html>; SHELDON, *A Really Hard Case: Iranian Space Ambitions and the Prospects for Us Engagement*, pp. 229-251.

²¹ The following data sources were used: KASS, *Iran's Space Program: The Next Genie in a Bottle?*, cit.; SHELDON, *A Really Hard Case: Iranian Space Ambitions and the Prospects for Us Engagement*, cit., pp. 229-251.

broadcast for television, telephone, radio, and internet. It is believed that the Zohreh satellites will not utilize anti-jamming and shielding needed for military usefulness²².

Iran also currently works on a project known as the Small Multi-mission Satellite (Smms) under the organization known as the Asia-Pacific Space Cooperation Organization (Apsco) headed by China. The project was announced in 2001 with the launch planned for 2005. However, it seems that this satellite is still being designed and has yet to be launched. The Smms will be a remote sensing satellite with one camera that will allow the members of Apsco to share its imaging capability. Although the resolution is unknown, it is reported to be low²³.

Finally, on 4 February 2008, President Ahmadinejad inaugurated a new space center and announced that within 12 months Iran would be launching its first indigenous satellite called Omid (launched in February 2009) along with four more satellite launches by 2010²⁴. It is unknown exactly what capabilities Omid would possess, but it is believed that plans are to place the satellite at a high inclination (allowing it to pass over Iran six times a day) and that it has antennas but no solar arrays. A lack of solar arrays means the satellites must run only on batteries and will only be in service for a fairly short time. The satellite was planned for a summer 2008 launch which never took place, however in February 2009 Iran announced that it had launched Omid into orbit. The Us detected the launch, but the deployment of a satellite has not yet been independently confirmed. Tehran announced plans to launch four more satellites by 2010²⁵.

²² The following data sources were used: *Iran's Zohre Satellite to Be Launched in 2009*, «Persian Journal», http://www.iranian.ws/cgi-bin/iran_news/exec/view.cgi/24/19451, 11 December 2006; L. KASS, *Iran's Space Program: The Next Genie in a Bottle?*, cit.; SHELDON, *A Really Hard Case: Iranian Space Ambitions and the Prospects for Us Engagement*, cit., pp. 229-251.

²³ The following data sources were used: KASS, *Iran's Space Program: The Next Genie in a Bottle?*, cit.; SHELDON, *A Really Hard Case: Iranian Space Ambitions and the Prospects for Us Engagement*, pp. 229-251.

²⁴ A. A. DAREINI, *Iran Opens Space Center, Launches Rocket*, «Associated Press» (accessed on Breitbart.com), http://www.breitbart.com/article.php?id=D8UJN86O5&show_article=1&image=large, 4 February 2008.

²⁵ The following data sources were used: DAREINI, *Iran Opens Space Center, Launches Rocket*, cit.; KARIMI, KEYSER, *Iran Claims First Launch of Its Own Satellite*, cit.; C. P. VICK, *Iran's Space Plans & Science & Technology Budget Three Year Fiscal Planning Cycle*, GlobalSecurity.org, [536](http://www.globalsecuri-</p></div><div data-bbox=)

Along with the launch of satellites themselves, Iran is developing the necessary infrastructure to operate them. The country runs the Iranian Space Agency (Isa), created in April 2003. The agency is under the Supreme Space Council, whose head is the President of Iran. To support the country's space efforts, education opportunities are offered in all areas of space science and operations, and Iran also runs a remote sensing center and an aerospace research center²⁶. Launch sites are located at Emamshahr and Qom. In August 2006, Ahmad Talebzadeh, the director of Isa, stated in the «Tehran Times» that Iran planned to become the space technology leader in Central Asia²⁷.

Finally, Iranian representative addressed the February 2009 meeting of the United Nations Committee on the Peaceful Uses of Outer Space (Copuos) stating that the Omid satellite launch would lead to further development of high technology. Reza Tagipour Anvari of Isa listed larger spacecraft, higher-capacity and longer range launch vehicles, and domestic development of ground infrastructure to support a growing space program as areas of future development and planning for Iran²⁸.

NUCLEAR PROGRAM TECHNOLOGY

Along with the ballistic missile and satellite programs, Iran is currently working on a much publicized nuclear program. Although Tehran has repeatedly stated that the aim of this program is peaceful nuclear power generation, many Western powers claim that Iran is working toward the creation of nuclear weapons. The major bone of contention is the Iri's attempt to control the whole nuclear fuel cycle which it believes it has the right to do so as a sovereign state. The West sites this as proof that the program is military in nature, reasoning that Iran wants to have full control over the cycle so no foreign power can stop it from making nuclear weapons²⁹.

[ty.org/space/world/iran/planning.htm](http://www.globalsecurity.org/space/world/iran/planning.htm), 25 March 2008 – 12 April 2008; VICK, *Iran's Up-coming First Satellite Launch Attempt & "Kavoshgar" Sounding Rocket & the First Satellite Launch Vehicle "Safire"*, cit..

²⁶ *Iranian National Space Agency*, GlobalSecurity.org, <http://www.globalsecurity.org/space/world/iran/agency.htm>, accessed on 7 May 2008.

²⁷ *Iran Planning to Est. Region's Top Space Program*, Info-Prod Research (Middle East), 2 August 2006.

²⁸ *Iran Sets its Space Sights Higher After Satellite Launch*, Space.com, <http://www.space.com/news/0902304-iran-space-ambitions.html>, 4 March 2009.

²⁹ *Q&A: Iran and the nuclear issue*, Bbc News, http://news.bbc.co.uk/2/hi/middle_east/4031603.stm, 15 September 2008.

The nuclear fuel cycle consists of the steps necessary to bring uranium from the ground to the fuel needed for a nuclear power plant or a nuclear weapon. Iran is working simultaneously on all aspects of the fuel cycle including mining, milling, conversion, enrichment, and fuel fabrication³⁰. The Nuclear Non-Proliferation Treaty (Npt) allows a country to operate a nuclear power program, but not to create nuclear weapons. The most sensitive part of the fuel cycle then becomes enrichment, since once nuclear fuel is enriched for use in a power facility it is only a repeated enrichment process that makes it viable for a nuclear weapon. The main method of ensuring that this is not achieved by Iran would be inspections and a transparent program to verify that weapons-grade enrichment is not being undertaken or that enrichment be done by another country and the fuel shipped to Iran. The Iri rejects both of these measures, and the Un Security Council and International Atomic Energy Agency (Iaea) want Tehran to cease its enrichment process. Various incentives and sanctions are being used as a carrot and stick by the Security Council but so far Iran is continuing its enrichment program³¹.

Complicating the matter is the level of assistance Iran has received from Russia, a member of the Security Council, in the last decade and a half in furthering the program. Russia's nuclear co-operation with Iran has been extensive, especially on the reactor at Bushehr. In January 1995, Russia and Iran signed a deal to complete the Bushehr reactor which had been started by Germany in the 1970s, and damaged during the Iran-Iraq war, for \$800 million as well as the sale of four other reactors to Iran for \$1 billion in February³². Despite Iran's use of an extensive arms smuggling network to acquire nuclear equipment³³, Russia maintained that a light-water reactor, as was being built at Bushehr, could not be used to produce material for nuclear weapons³⁴. Russian assistance

³⁰ *The Nuclear Fuel Cycle*, World Nuclear Association, <http://www.world-nuclear.org/info/inf03.html>, September 2008.

³¹ *Q&A: Iran and the nuclear issue*, Bbc News, cit..

³² *Bushehr – Background*, GlobalSecurity.org., cit.; *Russia, Iran, and the Bomb*, «The New York Times», http://query.nytimes.com/gst/fullpage.html?res=990CE2D_6103AF935A15751C0A963958260&scp=3&sq=russia%20iran%204%20nuclear%20reactors&st=cse, 26 February 1995.

³³ C. HEDGES, *Nuclear Trail – A Special Report.; A Vast Smuggling Network Feeds Iran's Arms Program*, «The New York Times», <http://query.nytimes.com/gst/fullpage.html?res=990CE1DE1E3FF936A25750C0A963958260&scp=2&sq=iran%20nuclear%20arms%20smuggling&st=cse>, 15 March 1995.

³⁴ *Bushehr – Background*, GlobalSecurity.org, cit..

continued throughout the rest of the 1990s, but in 2001 Russia decided to delay completion of the site with Deputy Russian Atomic Energy Minister Yevgeny Reshetnikov saying that the first reactor would not come online until 2004³⁵. Moscow did note that by 2004 more than 700 Iranian nuclear experts had been trained and in 2002 there were 600 Russian technicians working at Bushehr, but then in 2003 the date for completion was pushed back again to 2005³⁶.

In February 2005 a key deal was reached between Iran and Russia over nuclear fuel and it was agreed that Russia would supply the fuel and transport the spent fuel out of Iran to ensure it would not be used for a weapon program³⁷. It has also been alleged by the German news-source «Der Spiegel» that in 2005 France sold 300 units of Nickel 63 tritium targets to Iran that could be used for nuclear energy generation and nuclear weapons³⁸. Completion was also delayed, yet again, to 2006. In January 2006, Theran and Moscow discussed a proposal to have the Iri send uranium to Russia for enrichment, after Iran restarted enrichment at Isfahan the year before³⁹. The Iaea responded to the renewed enrichment program by voting to report Iran to the Un Security Council⁴⁰. In March 2006 Iran decided to reject the Russian proposal to move fuel enrichment to that country, and in September it was decided that Bushehr would be inaugurated in November 2007⁴¹. In early 2007, however, Russia postponed the Bushehr project again assert-

³⁵ *Bushehr*, GlobalSecurity.org, <http://www.globalsecurity.org/wmd/world/iran/bushehr.htm>, 19 February 2006.

³⁶ *Ibidem*.

³⁷ *Russia, Iran Sign Nuclear Deal*, «Associated Press» (accessed on Fox News.com), <http://www.foxnews.com/story/0,2933,148861,00.html>, 27 February 2005.

³⁸ «Der Spiegel», information from Center for Non-proliferation Studies at the Monterey Institute of International Studies, accessed on Nuclear Threat Initiative website, http://www.nti.org/e_research/profiles/Iran/Nuclear/2867.html, December 2005.

³⁹ *Powers Split over Iran Talks Bid*, Bbc News, http://news.bbc.co.uk/2/hi/middle_east/4619828.stm, 18 January 2006; *Timeline: Iran*, Bbc News, http://news.bbc.co.uk/2/hi/middle_east/country_profiles/806268.stm, 27 August 2008.

⁴⁰ *Timeline: Iran*, Bbc News, cit..

⁴¹ N. FATHI, *Iran Rejects Russian Offer to Defuse Nuclear Dispute*, «The New York Times», <http://query.nytimes.com/gst/fullpage.html?res=9404E5DB1031F930A25750C0A9609C8B63>, 13 March 2006; *Iran Reactor Launch Date Agreed*, Bbc News, <http://news.bbc.co.uk/2/hi/europe/5380874.stm>, 26 September 2006.

ing that Iran was not able to make payments while Tehran denied these allegations and instead believed Western pressure on Russia to stop the project was to blame, although in December 2007 Russia sent the first shipment of fuel to the reactor⁴². In February 2009 Russia and Iran set plans to sign a 10-year contract to provide Russian nuclear fuel and expert technicians for the Bushehr reactor which had been recently completed and began its testing phase⁴³.

The West's reaction to this program has been one of condemnation and attempts at diplomacy. In 2003 the Iaea stated that Iran failed to follow the Npt after inspections of the nuclear facilities at Natanz and Arak. Once reported to the Security Council in 2006 by the Iaea, Iran ended inspections and announced that it had produced enriched uranium. In mid-2006 the Eu offered a package of incentives if Iran would stop the enrichment process. Iran did not meet the suspension deadline and in December the Security Council voted to impose sanctions with further sanctions imposed in March 2007. As it stands, Iran refuses to suspend its program, and the Security Council and the West continue to call for further sanctions⁴⁴.

The question of importance for the West is whether Iran is seeking nuclear weapons or a peaceful energy generation program. Iran claims it is a peaceful program, but with calls for Israel's destruction and the back-and-forth rhetoric between Tehran and Washington one cannot be sure. There are definite strategic incentives inherent in possessing nuclear weapons that would benefit Iran. Beyond strategic uses, Iran would have a military use for nuclear weapons if it feels sufficiently threatened. The ballistic missiles in Iran's arsenal are all derivatives of the highly inaccurate Scud family. A nuclear warhead, with its greater area of effect and power, would be much more useful than conventional warheads without an advanced guidance system to effectively hit a particular target. In 2006 Us intelligence alleged that Iran was working on a

⁴² *Russia Pessimistic on Bushehr Project*, Radio Free Europe / Radio Liberty, <http://www.rferl.org/content/Article/1076708.html>, 25 May 2007; *Russia Ships Nuclear Fuel to Iran*, Bbc News, http://news.bbc.co.uk/2/hi/middle_east/7147463.stm, 17 December 2007.

⁴³ *Russia, Iran to Sign 10-year Nuclear Fuel Supply Contract*, Ria Novosti (accessed on GlobalSecurity.org), <http://www.globalsecurity.org/wmd/library/news/iran/2009/iran-090225-rianovosti02.htm>, 25 February 2009.

⁴⁴ *Timeline: Iran's Nuclear Program*, AlJazeera.net, <http://english.aljazeera.net/news/middleeast/2007/12/20085251853218888.html>, 10 July 2008.

Project 111 that includes work on adapting missile warheads to utilize nuclear weapons. This determination was based on the analysis of classified documents believed to be drawings by Iranian engineers, drawings showing various designs to perfect a rocket nose cone to fit a nuclear device. Project 111 is also believed to be based on Project 110, the military side of Iran's nuclear efforts⁴⁵.

THE RUSSIA-IRAN AXIS

In looking at Iran's growing technological prowess, the tangible benefits of its relationship with Russia can be seen. In this arena, one may argue that both Moscow and Tehran are considering their partnership in a very pragmatic way while pursuing common security goals. The main goals of the Iranian space program, with both ballistic missiles and satellites, are being realized in cooperation with Russia.

From the listed projects, it is clear that Russia significantly contributes to high tech development in Iran including the space, nuclear and military domains, although the Kremlin does not approve the excessive anti-American and anti-Israeli rhetoric of President Ahmadinejad, for security reasons. Nevertheless, the fact that Iran represents a considerable market for Russia is more important than the negative rhetoric of the current Iranian administration. Moreover, for access to the Iranian market, the competition with Europe, China and Japan incites Russia to offer several important advantages to Tehran. President Ahmadinejad reoriented Iranian trade pattern from one the West to one with the East. By the end of 2007, the volume of bilateral trade with Russia was above two billion dollars⁴⁶. Interestingly enough, while increasing the volume of imports from Russia, Iran has not hidden its intention to transfer Russian high technologies to its own industries.

A special aspect of Russian-Iranian technical cooperation is that Tehran is trying to use Russian scientists and technology for the development of its national military as well as non-military industries, outside the official avenues of the two States' cooperation which is controlled by the Kremlin. Iran is constantly looking for and inviting experts and specialists from Russia and other Com-

⁴⁵ D. LINZER, *Strong Leads and Dead Ends in Nuclear Case Against Iran*, «Washington Post», <http://www.washingtonpost.com/wp-dyn/content/article/2006/02/07/AR2006020702126.html>, 8 February 2006.

⁴⁶ *Russia-Iran Trade Doubles to \$2.2 bln in 9M07 – Official*, Ria Novosty, <http://en.rian.ru/russia/20071213/92206175.html>, 13 December 2007.

monwealth of Independent States (Cis) countries for work under private contracts in space, aircraft, and other industries. This kind of cooperation does not always comply with the standards of either government or of international institutions. Moreover, such private cooperation often avoids the usual pressures from Moscow and other foreign actors in Iranian affairs.

As emphasized earlier, Moscow does not seem concerned by the development of Iranian space program. However, the idea of Russian balancing against the Usa should be taken into account. The Kremlin is emphasizing the peaceful nature of recent Iranian space achievements, revealing its main purpose of countering anti-ballistic missile system deployment in Europe. The official representative of the Russian Foreign Ministry, Andrej Nesterenko, was explicit enough in explaining that satellite launch and missile development are not related, and that the launch of a satellite cannot justify the deployment of an anti-ballistic missile system in Poland and the Czech Republic⁴⁷.

One can observe a similar pattern of relationship within the military industry. From one side, Russia is considering selling defense armament systems to Tehran, making money and reinforcing a balancing power in the region. From the other side, the Kremlin is reluctant about delivering attack systems fearing not only international sanctions and the building of excessive strength in the Islamic Republic, but also the potential derailment of a new relationship with the Usa⁴⁸. At the same time, Tehran is using Russia's economic potential as a gate to high military technologies while diversifying suppliers and trying to develop its own high tech military industry.

Still, Iran keeps importing missile equipment from Russia although the scale of trade depends on the State of the Russian-Western and especially the Russian-American relationship. The decade of the 1990s was characterized by Russia's will to be a good partner for the West, a period which can also be considered her hand-wagon with the West. The Gore-Chernomyrdin Protocol, established in the mid-1990s, explicitly obliged the Kremlin to freeze all mili-

⁴⁷ *Россия по ер жала космическую программу Ирана (Russia Supported Iran's Space Program)*, RosBeznsKonsalteng (Rbk), http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=52858, 19 August 2008.

⁴⁸ *Russia May Not Ship S-300 Missile Systems to Iran Hoping to Improve Ties with Usa*, Pravda.ru, http://english.pravda.ru/world/asia/17-02-2009/107115-russia_s300_iran-0, 17 February 2009.

tary contacts with the Iri. At the start of Putin's Presidency in 2000, Russia unilaterally quit the *memorandum* and since that time its military cooperation with Iran has been constantly growing⁴⁹.

It is important to emphasize that the peaks in Russian-Iranian military cooperation match those of deterioration in the relationship between Moscow and Washington. Russia moved to assist the Islamic Republic with the building of an integrated air defense system when Russian-American relations suffered from the war in Iraq and the wave of color revolutions in the post-Soviet space. Moscow had considered selling S-300Pmu-1 systems to cover Iranian nuclear sites, but deals have been on and off for the last few years with no actual sale. Recently, Russia decided again to cancel any potential sale⁵⁰. The suggestion of selling these advanced weapon systems to Iran has provoked considerable criticism from the West and Israel.

In 2005, Russia agreed to sell Iran 29 Tor-M1 systems to ensure coverage for any potential future S-300 systems⁵¹. But in January 2006, all negotiations were frozen by Moscow. By doing this Moscow expressed her disagreement with developments in Tehran's nuclear program. Relating this development to the before mentioned factors, Russia simply meant to keep Tehran's military and nuclear developments under control. In December 2007, after a regular session of the Russian-Iranian commission on Military and Technical Cooperation, the chief of the Russian Federal Service of Military and Technical Cooperation, Dmitriev, declared that their cooperation is vitally important for preserving the balance of power in the region⁵².

Besides the Tor-M1's, Iran declared itself ready to buy S-300 and Iskander-E missile systems. According to the Russian newspa-

⁴⁹ *Russia to Sell 29 Air Defense Systems to Iran*, Pravda.ru, <http://english.pravda.ru/russia/politics/03-12-2005/9334-iran-0>, 3 December 2005.

⁵⁰ The following data sources were used: N. ABUDLLAEY, *Russia: No S-300 Missile Systems for Iran*, DefenseNews, <http://www.defensenews.com/story.php?i=3764075>, accessed on 13 May 2009; *Iran Shields Its Nuclear Activities by Russian Missiles*, Kommersant, http://www.kommersant.com/p840222/Iran_Air_Defense_S-300/, 27 December 2007.

⁵¹ P. FELGENHAUER, *Iran Takes Delivery of Russian Tor-M1 Missiles*, The Jamestown Foundation, [http://www.jamestown.org/single/?no_cache=1&tx_ttnews\[tt_news\]=32397](http://www.jamestown.org/single/?no_cache=1&tx_ttnews[tt_news]=32397), 17 January 2007.

⁵² *Дай о жест российской прессы - 24 декабря (Summary of Russian Press Releases - December 24)*, КОММЕРСАНТЪ (www.kommersant.ru, accessed on Ria Novosti), <http://rian.ru/media/20071224/93884766.html>, 24 December 2007.

per «Kommersant», Iran is interested in purchasing modern integrated air defense systems for protecting its primary nuclear sites, which can become targets for possible American or Israeli bombardments. The newspaper argues that Russia and Iran are now finalizing the deal on supplying five S-300 missile systems⁵³. However, there is not enough evidence for such a deal at the present time, and Russia's on-and-off use of potential arms deals to keep Iran in line make the situation difficult to read.

If the deal is put into effect, the supply of these S-300Pmu-1 systems to Iran will unavoidably lead to further deterioration in Russian-American relations. These missiles can reach their targets at a distance of 5-150 km and can reach heights of 27 km⁵⁴. The targets could be American fighters and bombers on Iranian soil. The Moscow office chief of the Institute of World Security, I. Safranchuk, noted that Russia often increases Iran's (and Syria's) air coverage capacities. He said that «[...] this process is aimed at countering American plans to use force in the Middle East. As soon as Moscow thinks that the United States is ready to attack Iran, it deescalates the situation, but under the condition that Iran will cooperate with the Iaea»⁵⁵.

Moscow definitely holds the reins when it comes to its direct relationship to Iran, but Tehran has shown a remarkable ability to get what it wants, and to manipulate geopolitical situations to its own advantage. History shows that much of Iran's initial missile and nuclear technology, although Russian in origin came through third parties. Nuclear material through A.Q. Khan's network, Scud technology from North Korea, and partnerships with China complicate the relationship greatly for Russia. Iran's growing ability to 'play the great powers' for its own advantage potentially holds the most danger for Russia. Moscow's ability to keep the Iri in check gives it the upper-hand but it is an advantage that continues to weaken as Iran strengthens other partnerships.

⁵³ *Иран приобретет пять ивизионов С-300 (Iran to Buy Five S-300 Missile Systems)*, КОММЕРСАНТЪ (www.kommersant.ru, accessed on Lenta.ru), <http://lenta.ru/news/2007/12/27/air/>, 27 December 2007.

⁵⁴ *The Russian S-300Pmu-1 Tmd System*, James Martin Center for Nonproliferation Studies, <http://cns.miis.edu/cyprus/s300tdms.htm>, accessed on 13 May 2009.

⁵⁵ Konstante Ђланtratov, Aleksandra ЂГриtkova (Konstantin Lantratov, Aleksandra Gritskova), *Иран прикрывает атомную программу русскими ракетами (Iran Uses Russian Rockets as a Distraction from Its Nuclear Program)*, КОММЕРСАНТЪ (www.kommersant.ru), <http://www.kommersant.ru/doc.aspx?DocsID=840222>, 27 December 2007.

INTERNATIONAL FACTORS

The Iranian space program, and the technology trade that sustains it, is the national program of a single country but it exists in an international arena and is affected by and affects other countries; it does not stand alone. It was seen, in looking at the missile program, that Iran received assistance from a handful of other countries. The relationship with North Korea is a complex one that allows both nations to share resources, material, expertise, and experience. That relationship has been of great importance to Iran's space program but assistance from the major space powers of, especially, Russia and China have boosted the Iranian program a great deal.

China provides value in terms of knowledge and a forum for international cooperation. Iran is a member of the Asia-Pacific Space Cooperation Organization (Apsco) that is headquartered in Beijing and headed by China. Included in Apsco as well are Pakistan, Thailand, Mongolia, Bangladesh, Indonesia, Peru, and Turkey. Through Apsco, Iran works with China on Small Multi-Mission Satellite (Smms) development, and it is claimed that Iran is working on the imaging system for Smms⁵⁶. As well, it is thought that China has helped Iran obtain solid fuel technology and Iranian missiles bear resemblances to Russian and North Korean technology⁵⁷. Iran also has a partnership with India that allows it to utilize data from Indian remote sensing satellites⁵⁸.

Nevertheless, it is Russia that has provided Iran with its greatest amount of technology trade and assistance. Moscow has provided Tehran with launch services in the past and it is also known that Russia has continued to help Iran develop its nuclear program, even in the wake of Un sanctions. This partnership can best be understood in geopolitical terms.

In terms of Iran's partnerships that allow for international cooperation, there are negative implications for the West. The Iri's rivals (i.e., Israel and the Usa) accuse Iran of wanting to utilize space and nuclear technology for military reasons that will destabilize the Middle East. Even some Muslim states are unsure to trust Iran's calls for these so-called peaceful programs. In recent years,

⁵⁶ KASS, *Iran's Space Program: The Next Genie in a Bottle?*, cit..

⁵⁷ *Iran's Ballistic Missile Program*, «Iran Watch», <http://www.iranwatch.org/wmd/wmd-iranmissileessay.htm>, August 2004.

⁵⁸ SHELDON, *A Really Hard Case: Iranian Space Ambitions and the Prospects for Us Engagement*, cit., pp. 229-251.

the Usa has put pressure on Iran through calls for sanctions and its own laws that aim to slow or stop proliferation to Iran. Usa pressure may have been the reason why the Mesbah satellite was never launched by Russia. Certainly the former Usa plans to build missile defense sites in Eastern Europe (under the auspice of protection from Iranian missile) could have given the Russians more incentive not to help Iranian missile development. As another regional player, Israel would lose heavily, if Iran were to obtain remote sensing satellites that could give Tehran early warning of Israeli military plans. Tehran's other regional rival, Saudi Arabia, would rather Iran not gain the prestige of having a successful space program.

As the Russian-Iranian relationship stands currently, Russia firmly calls the shots: this can best be seen by looking at the history of the Bushehr project. Tehran realizes its high tech dependency on Moscow and is eager to partner with other global and regional powers (e.g., China) to weaken its dependency on any other State. The important issue is that if relations between Iran and the West do not improve, the capability of the West to pressure Iran through Russia will only lessen; and Iran's global partnerships (e.g., China) will grow. The global implication of such developments is that it requires a much more complicated diplomacy to deter Iran.

RATIONALE OF THE IRANIAN SPACE PROGRAM AND ITS FUTURE

Space programs require high levels of resources and education, and are especially difficult for developing countries to operate. One may ask: Why the Iranians work toward mastering space technology? By examining the programs of the great space powers, it becomes clear that these programs are undertaken for various distinct sets of reasons. One of these sets, or viewpoints, is that of the political viewpoint which calls for a space program for reasons such as national security and prestige.

Lee Kass notes in *Iran's Space Program: The Next Genie in a Bottle?* that «[...] a mature space effort would provide Iran with *more* national pride than the nuclear program, because Pakistan could boast that it is the first to own "an Islamic bomb". However, all Islamic countries lack the scientific infrastructure to launch satellites independently»⁵⁹.

Iri has hopes that international prestige from running a successful space program will show the world that Iran is a regional

⁵⁹ KASS, *Iran's Space Program: The Next Genie in a Bottle?*, cit..

power, adding to its soft power. Many analysts noted that the majority of the Iranian people do not support policies of the government; a space program, it is reasoned by those in power, will bring the populace behind the regime and lessen debate on other issues.

Along with prestige, the Iranian space program is meant to enhance national security. Iran considers its main regional rival to be Israel and its space program meant to compete with the Israeli program. In fact, the relationship between these rivals reveals many similar circumstances. Hooshang Amirahmadi notes in *Nuclear Geopolitics in Us-Iran Relations*.

«Iranians are a nation of Aryan race, of Shi'a Islamic religion, and of Persian language, in the midst of many Semitic or Turkic, Sunni Islamic, and Arabic or Turkish-speaking nations. Only Israel can be considered a similarly lonesome nation in its region – and ironically the two lonely States despise each other»⁶⁰.

One wonders how two States that are similarly lonely and are not direct neighbors in dispute over borders became such bitter enemies (considering that Iran was the second State to recognize Israel, after the Usa), but that issue is beyond the scope of this paper.

Suffice to say Israel's neighbors do not dispute its power, and Iran looks to the Jewish State as a model for growth. Israel, the Iri notes, can field Mrbms, can launch satellites, runs an exceptional remote sensing program with excellent imaging capabilities, and may have as many as 200 nuclear weapons. Could Iran be considered a regional power, or even safe, without similar or better capabilities? Israel claims that its military technology is required because it exists in a dangerous neighborhood; Iran only claims that it is a citizen of the same neighborhood.

Iran also makes the claim that its space and missile programs are completely peaceful and are meant to help the country develop economically⁶¹. While the Us and Israel claim that Iran is trying to obtain nuclear weapons and a long range launch capability, the Iranian President continues to stress that its nuclear program is only for energy generation. The Iran space program, the government claims, is to improve telecommunications, expand science education, and further the mastery of high technology. The claim of

⁶⁰ H. AMIRAHMADI, *Nuclear Geopolitics in Us-Iran Relations: The Case for a Big Push Toward Confidence Building*, American Iranian Council, <http://american-iranian.org/publications/articles/2008/01/nuclear-geopolitics-in-usiran-relations-the-case-for-a-big-push-toward-confidence-building.html#more>, 23 January 2008.

⁶¹ A. COHEN, *The Real World: Iran's Space Rocket Launch*, cit..

purely peaceful science is spurious, however, as Iran has turned down international incentives and opted instead to work toward control of the entire nuclear fuel cycle while riling the international community⁶². Control of the nuclear fuel cycle and various decisions in the space program (such as the testing of solid fuel missiles) often hint toward military applications. In the reasoning of the Iranian government, these decisions may stem from the desire for Iran's national security to be unbound from foreign influence. The risk, however, is that this line of thinking may ultimately leave the country less secure.

The challenge for all countries involved is that Iran and its enemies, and potentially even its allies, seem to be mutually unsure of the other's intentions. Iranian President Ahmadinejad called for Israel to be «wiped off the map» and the Usa, as a hollow superpower, to be rejected⁶³. The Bush administration called for regime change in Iran, a huge threat to those in power, and had mentioned the military option. Moreover, Israel is widely believed to have plans to destroy Iranian nuclear sites if it feels this course of action is necessary. With the current situation in which the Usa and Iran do not have official diplomatic contact, understanding each other and working toward mutual solutions is close to impossible.

THE WESTERN RESPONSE

At the present time, the Western response to an Iranian technology threat has consisted of sanctions and threat-based posturing. Both have had mixed results, but do not seem to be stemming the trade or causing Iran to rethink its actions. At the other end of the spectrum is apathy and derision best shown by the Usa response to the launch of Omid, by calling it «Sputnik technology» and simply a device that beeps and does nothing more⁶⁴. Are there other options besides what has been tried and a region-destabilizing military action?

Theoretically, sanctions and posturing stem from a neo-realist view of the relationship between these States. When we speak of

⁶² G. BRUNO, *Iran's Nuclear Program*, Council on Foreign Relations, http://www.cfr.org/publication/16811/irans_nuclear_program.html, 2008.

⁶³ SHELDON, *A Really Hard Case: Iranian Space Ambitions and the Prospects for Us Engagement*, cit., pp. 229-251.

⁶⁴ U. RUBIN, *Yes, We Should Worry About Iran's Satellite*, Wall Street Journal Online, <http://online.wsj.com/article/SB123517621950437485.html>, 21 February 2009.

balancing from Moscow and the drive for self-sufficiency from Tehran, these are an implicit neo-realist mindset. Most important to this perspective, however, is the urgency created by Iran's drive for nuclear weapons and ballistic missiles which represent a direct, military threat to the US allies at least. In this case, sanctions are short-term solution, to end or at least frustrate and delay Iran's possession of these weapons. Neo-realist balancing, however, doesn't offer longer term solutions.

Neo-liberalism provides a view that is focused on the long-term stability created by cooperation between States. In the neo-liberal perspective, normalizing relations between the West and Iran provides the best solution to avoiding conflict for all parties involved. Provided that diplomatic expectations are kept at realistic levels, building cooperation between these States may be possible.

The idea of a 'Grand Bargain', a situation in which both the USA and Iran put everything on the table and engage in direct negotiations, could be undertaken. Since Russia can effectively keep Iran in check and uses its relationship with Tehran to give it leverage with the West, it may be possible to have Russia mediate in this effort. This would have two benefits: including Moscow in any negotiations sends the message that it is still seen by the West as a necessary member in geopolitical affairs, and it can also build more understanding between the USA and Russia, lessening tensions between these powers. A Grand Bargain would, however, require a level of trust between the USA, Russia, and Iran that can hardly be said to exist. I believe this situation represents an overreach of neo-liberalism and an attempt to ignore the reality of decades of USA-Iranian (and US-Russian) animosity. According to US Defense Secretary Robert Gates, a Grand Bargain is «completely unrealistic» and off the table⁶⁵.

A more realistic path might be the confidence building measure like establishing diplomatic relations between the USA and Iran, starting with a small number of attainable goals to build trust. Russia could still be a valuable partner in this effort, for the above-stated reasons. If the West wishes to negotiate, the present time looks to be favorable. Falling global oil prices comparatively weaken both Russia and Iran, and the leadership of President Barack Obama who is seen as more open to diplomacy may bring Moscow

⁶⁵ Gates: 'No Grand Bargain' with Iran, «The Jerusalem Post» («Associated Press»), <http://www.jpost.com/servlet/Satellite?pagename=JPost/JPArticle/Show-Full&cid=1239710869911>, 5 May 2009.

and Tehran to the table. There is definitely a window in this effort, however, as Iran continues to gather new partners. If the West wants to engage in relatively easy direct negotiations with Iran, and with Russia as a partner, instead of complex multilateral negotiations including China and others, it should begin to seek diplomatic solutions as soon as possible.

This merging of both theoretical perspectives offers the best chance of a way forward. The mechanics behind the foreign policies of Russia, Iran, and the Usa toward each other represent a balancing dynamic and the fear that each represents to the others. From the Western perspective the short-term neo-realist fear of Iranian possession of weapons of mass destruction needs to be addressed. Engaging Russia to assist in bringing Iran to the negotiating table over this issue would put the Usa and Western powers in a strong position to get what they want. However, the Usa may have to give up Nato enlargement and the Eastern European anti-ballistic missile shield (as recently reported) to get what it wants from Iran via Russians. If the cost-benefit analysis is favorable for this trade-off, the Iranian nuclear issue may be soon neutralized.

CONCLUDING REMARKS

Iran's dependency on American technology led Tehran to serious challenges when Washington withdrew its support after 1979 Revolution, especially after Iraq invasion. Since then, Tehran avoided technological dependency. The unavailability of Western technology, however, forced the Iri to cooperate more with Moscow. Considering the mistrust between Tehran and Moscow, their technology trade grew as a result of their needs, which cannot be explained by the Natural Ally idea, rather with the Marriage of Convenience notion.

Our discussion indicated that a number of domestic and especially international factors brought them together. If the Usa aims to stop Russian support of Iran, then it must pay the right diplomatic price, such as cancelling the missile defense project (in Poland and Czech Republic), as recently reported. On the other hand, Washington should also negotiate with Iran. Thus, the Obama administration declaration that it is willing and able to negotiate with Iran without any pre-conditions anywhere at anytime and about all issues at hand is a step in the right direct.