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North Korea and Iran's Nuclear Programs as Instability Factors in the New System of International Relations

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North Korea and Iran's Nuclear Programs as Instability Factors in the New System of International Relations*

By Dr. Natalia P. Romashkina **

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Foreword

In one of the great examples of the re-convergence of thinking on security issues following the end of the Cold War, it is now the widely held belief of the UN Security Council, NATO, the EU, the Shanghai Cooperation Organization and others that the two leading security problems of our era are terrorism and proliferation of Weapons of Mass Destruction (WMD).

In this study Ms Romashkina takes a critical look at the most challenging proliferation issues of our time, North Korea and Iran. Her detailed and carefully documented study goes well beyond the current rhetoric of politics and looks closely at historical developments, geopolitical factors, the scientific parameters of such development, and the potential consequences of the acquisition of weapons in these two countries.

Of critical importance for the present and the future is the role of international organizations from the UN Security Council to the International Atomic Energy Agency in addressing these concerns on behalf of the international community. While the two independent cases of proliferation challenge she examines are still unresolved, she clearly lays out the risks for the two organizations in facing future challenges, based on the eventual outcome of the two cases examined here.

She, likewise, looks at the security implications of the emergence of North Korea and Iran as nuclear weapons states for neighbors, such as China and the EU, and of particular importance for Russia and the United States, as the leading nuclear powers. For all states, she reviews attempts to resolve the proliferation challenges from Iran and North Korea and examines the reasons that the desired results have not yet been achieved.

Finally, her careful study and analysis places proliferation in its new and proper context for a world that is no longer bipolar, where competing ideologies divided the globe into two camps and where the balance of power between these two global camps defined the understanding of security and stability for all others. As she notes, in the new world security context even broadly shared goals may not be supported with broadly held strategies on how to achieve those goals.

The challenge of proliferation remains and the outcome of these two cases remains unknown as this study goes to press. This study makes a significant contribution to the understanding of this complex issue and will remain relevant even when we ultimately learn the outcome of continuing negotiations with North Korea and Iran.

John P. Rose, Ph.D.
Director
George C. Marshall European Center for Security Studies

Executive Summary

With the end of the Cold War came widespread hope that the greatest security threats of the second half of the last century, including the most destructive threat of nuclear proliferation, would slide into history. Unfortunately, like many of the hopes of that period, this one has not proven to be true.

While the period and risk of “Mutual Assured Destruction” between the United States and the Union of Soviet Socialist Republics no longer occupies the foremost thoughts of security planners, nuclear proliferation remains at the forefront of the agenda of the UN Security Council and strategic planners. In this carefully researched paper, Ms Natalia Romashkina looks in detail at the two most imminent threats: North Korea and Iran.

The article examines carefully the historical conditions and security concerns that led the two nations to make extraordinary investments and take risks which have led the two countries independently to their current status. The important role of geopolitics and the shifting relations with critical neighbors have greatly influenced the choices each country has made. The technical challenges of creating the necessary infrastructure to pursue a goal as costly and complex as the development of nuclear weapons are examined in the two cases. Finally, the role of other nations in making possible the development of these capabilities more rapidly than either country could have done independently is an important variable considered here.

While the two cases are well worth studying in terms of their internal dynamics, perhaps the most important aspect of this study for the longer run and larger global community is the light that the two case studies shed on the tools available to control nuclear weapons proliferation. Here the study brings light to the role performed by the Nuclear Non-Proliferation Treaty and the International Atomic Energy Agency with its inspection and reporting functions in Iran and North Korea, as well as to new international approaches. In the case of North Korea this focuses on the Six Party Talks (North Korea, South Korea, Japan, China, Russia, and the United States) and in Iran, on the various efforts of the European Union and specifically the role accepted by France, Germany, and the United Kingdom in seeking a solution that would permit Iran nuclear energy without a risk of weapons proliferation.

A final aspect that highlights the importance of this study is the consideration of the impact that successful nuclear weapons proliferation in North Korea and Iran could have on the policy choices made by other nations in their respective neighborhoods. Excluding India, Pakistan, and Israel, who were never members of the Non-Proliferation Treaty, the bargain of the non-nuclear states in not obtaining nuclear weapons has held for most of the last half century not due to national limitations on the potential for weapons development, but on security guarantees that generally assured that the non-nuclear powers did not face risks from those who possessed them. Many speculate that a nuclear weapon equipped Iran and North Korea would fundamentally shift that balance and result directly in states such as Japan and Saudi Arabia acquiring similar capabilities.

The established relationship of Iran as a sponsor of Hezbollah and the unfortunate track record of North Korea as a major proliferator of ballistic missiles make this particular study even more important than it would be otherwise. The catastrophic effects of nuclear weapons have only increased since the August days in 1945 when Nagasaki and Hiroshima were devastated by single bombs. The specter of such weapons in the hands of non-state actors or fanatical leaders must be the world’s ultimate security concern.

List of Acronyms

| | |
|------|--|
| AEOI | Atomic Energy Organization of Iran |
| CIA | Central Intelligence Agency |
| CIS | Commonwealth of Independent States |
| CPSU | Communist Party of the Soviet Union |
| DPRK | Democratic People's Republic of Korea |
| GDP | Gross Domestic Product |
| HEU | Highly Enriched Uranium |
| IAEA | International Atomic Energy Agency |
| ICBM | Inter-Continental Ballistic Missile |
| KEDO | Korean Energy Development Organization |
| LWR | Light-Water Reactor |
| MRBM | Medium-Range Ballistic Missile |
| MTCR | Missile Technologies Control Regime |
| NMD | National Missile Defense |
| NPT | Nuclear Non-Proliferation Treaty |
| NSC | National Security Council |
| PSI | Proliferation Security Initiative |
| R&D | Research and Development |
| SORT | Strategic Offensive Reduction Treaty |
| SOW | Strategic Offensive Weapons |
| SRBM | Short-Range Ballistic Missile |
| UNO | United Nations Organization |
| USA | United States of America |
| USSR | Union of Soviet Socialist Republics |
| WMD | Weapons of Mass Destruction |
| WTO | World Trade Organization |

*“... there are two methods of fighting, the one by law, the other by force: the first method is that of men, the second of beasts; but as the first method is often insufficient, one must have recourse to the second.”*¹

Niccolo Machiavelli
The Prince

Introduction

All concepts of nuclear deterrence, strategic stability, and negotiations on limiting and reducing of nuclear weapons were developed during the historical period called the bipolar age. Since the end of the Cold War, international relations have been characterized by a dynamic and multifaceted transformation. A more complex, vibrant, and often unpredictable framework of international relations and alignment of forces replaced the bipolar world. This framework is, and will be, based on new principles and models of interaction among states, supranational institutions and nongovernmental organizations and movements.

From the late 1940s to the late 1990s, the approximately equal military strength and global political influence of the two superpowers, the USSR and the USA, created a sense of equilibrium. Their military and political alliances and broader, less rigid global coalitions seemed equally matched. In the early 1960s, that clear-cut scheme began to deteriorate in China's wake and the coalescence of the movement of non-aligned states. Nevertheless, until the late 1980s, the People's Republic of China had remained merely a regional power in a military, economic, and political sense. The bipolar model still dominated the real politics.

This alignment of forces was overshadowed by an ideological confrontation of the two social value systems in the opposing coalitions, commonly referred to as the Cold War. It is possible that the Cold War did not become a hot war thanks to the deterring role of nuclear weapons. By the end of the 1980s, the two superpowers had accumulated arsenals of nuclear weapons. Numerous local and regional conflicts and crises which served as dominance displays of the Cold War involved the superpowers to varying degrees but stopped short of direct armed conflict between the two states. Another Cold War manifestation was a large-scale nuclear and conventional weapons race aimed at achieving military advantage and superiority.

Most experts believe that nuclear weapons, strategic stability principles, and a system of nuclear deterrence played important roles not only in preventing the Third World War, but also in curbing regional wars and conflicts. The post-Cold War surge in ethnic, religious and other internal armed conflicts could be attributed to the transformed relationships that now dominate international politics. Neighboring countries are almost always drawn into conflicts and throw support to one of the hostile parties. Thus, a small conflict may become a drawn-out war between two countries.

Bipolarity and ideological struggle, the main characteristics of the Cold War, became obsolete after the break-up of the USSR and the disintegration of its military and political coalition of countries with similar economic, social, political, and ideological national systems and foreign-policy preferences. The two superpowers' military confrontation—a confrontation that could

¹ Machiavelli, Niccolo. *The Prince*. Translated by W. K. Marriott. 1908. <http://www.constitution.org/mac/prince00.html>.

have led to the Third World War—ceased to exist.

Russia's economic power now amounts to less than ten percent of the US gross domestic product (GDP). In the world's ranking of nations by GDP, the successor state to the USSR sank from second to tenth place.² Though Moscow's military power, particularly its nuclear component, is apparently comparable to US power in overall quantity, many of its quality parameters have degraded. By the beginning of the 21st century, the real combat capabilities of the military forces that support national security and foreign policy had diminished. Furthermore, according to classical geopolitical criteria, in the 1990s the new Russia not only lost almost all its military and political influence in the world, but also its leverage in what was taking place in the Commonwealth of Independent States (CIS), neighboring Eurasian regions, and even some of its own peripheries.

At the same time, instead of the prevalent postures of standoff and competition, the Russian Federation, the United States, and the entire West embarked upon economic, political, and even military cooperation. Especially after major terrorist events in Russia and the United States, the leading powers' outlook on security threats, defense needs, and military use changed significantly. In the 1990s and the first years of the new century, all aspects of international relations including military relations have continued to undergo major transformations, whose consequences are presently unclear.

Both scientists and politicians present different models of the world in the 21st century. One model is monopolarity, which infers US-led Western dominance with resistance provided by the anti-globalization movement. Another model envisions a new bipolarity centered on the United States and China. Yet another theory involves multipolarity of international relations with several major poles of global and regional scale. Some scholars predict various combinations of these models, where some aspects of monopolarity may be combined with bipolarity or multipolarity.

These various possible models of international relations create completely new conditions for ensuring global security. One of the most important aspects of the problem is the inevitable shift in the approach to security of nuclear weapons and their delivery systems and, to a lesser degree, to other weapons of mass destruction (WMD) and their delivery vehicles.

Until the mid-1990s, despite the proliferation of nuclear weapons during the Cold War, as nations emerged with new nuclear capabilities, nuclear forces outside the arsenals of either superpower amounted to less than ten percent of those possessed by either superpower. The USSR/Russian Federation and the US had more than ten thousand strategic nuclear weapons, which did not include the thousands of non-strategic nuclear forces. These numbers will certainly affect the emerging system of international military and political relations.

The system established by the Nuclear Non-Proliferation Treaty (NPT) is not perfect. India and Pakistan attained nuclear status after nuclear tests in 1998 and Israel is reputed to have clandestine nuclear potential. Eight nations already possess nuclear weapons and indications suggest that two more countries, North Korea and Iran, either possess or aspire to possess nuclear weapons. If the number of states that have such weapons keeps growing, the five nuclear nations will most likely refuse to fulfill all of their disarmament obligations set by the NPT. Some countries that have technological and economic means to possess nuclear weapons may

² CIA materials. <http://www.cia.gov/cia/publications/factbook>.

reconsider their non-nuclear status. In the worst-case scenario, it is conceivable that within two decades, more than 30 countries will be enriching uranium legally without violating the NPT and will become nuclear nations. As a result, the entire international security system would be significantly destabilized. To avoid this scenario, international stability should be enhanced by reinforcing the nuclear nonproliferation regime and preventing any states from acquiring nuclear weapons in the future.

The degree of probability that non-nuclear nations could obtain nuclear technologies and equipment necessary to produce nuclear weapons has become a very important issue. North Korea, Iran, Libya, and several other countries have been suspected of nuclear acquisitions. These countries were either able to come close to producing nuclear weapons without clearly violating the NPT or withdraw from the treaty with impunity.

Major terrorist events in Russia and the United States greatly influenced interest in security priorities and made people consider both the unpredictability factor in military and political issues as well as the more specific issues of nuclear weapons and other WMD. Presently, nuclear proliferation and critical technology transfer are prime concerns since nuclear weapons or their components could fall into the hands of terrorist organizations.

Over the next decade, while Russia and the United States plan major cuts in nuclear forces, third countries will maintain or increase nuclear missile armaments and some threshold states may develop nuclear weapons. Consequently, each leading power's nuclear forces may be equal or in some cases weaker than the combined nuclear forces of the other nuclear nations. Hereafter in this text, the term nuclear and missile multipolarity will refer to the entire set of changes in the framework of the international military and political relations. This new era of nuclear multipolarity has replaced the earlier bipolarity. This shift affects and will continue to most seriously affect strategic relations between Russia and the United States, and between these two countries and third countries.

Traditional notions of nuclear deterrence, parity, equal security, military sufficiency, strategic stability, principles, and methods of negotiations and treaties, and weapon-program planning will have to be thoroughly reconsidered. This process is, in fact, already under way. In 2002 the US and Russia began by signing the Strategic Offensive Reductions Treaty (SORT) and the Joint Declaration of the New Strategic Relationship. However, neither the treaty nor the Joint Declaration had been thoroughly thought out or was securely grounded in an analytical base. No open, official data on the subject can be found in Russia, the United States, or other nuclear nations. Moreover, the two leading nuclear nations do not consistently coordinate their approaches to those problems.

Presently, according to Article 9 of the NPT,³ the five official nuclear nations are permanent members of the UN Security Council and have veto power. It should be noted, however, that they do not have a common understanding of modern threats in the context of nuclear multipolarity. It would be interesting to see how a consensus could influence all proliferation risks. For example, what elements of the past experience in international military and political relations in the nuclear sphere would apply to the new situation and what elements would require conceptual and fundamental adjustment?

³ *Nerasprostranenie iadernogo oruzhiia. Sbornik dokumentov.* (Nuclear Weapons Non-Proliferation. Collection of Documents). Moscow: Mezhdunarodnye otnosheniia, 1993.

Given the new geopolitical situation, we can define the major elements of strategic stability analysis:

- examining the traditional principles of strategic stability as a basis for relations between the USSR/Russian Federation and the United States, particularly strategic offensive weapons (SOW) during the Cold War and the transformation of the relations in the post-bipolar system;
- describing the global post-Cold War global military and political situation while taking and considering the emergence of regional power centers as a result of nuclear proliferation, proliferation of other WMD, and their delivery systems;
- forecasting the possible nuclear, missile and WMD potentials of nations that possess such armaments, or are on the threshold of their developing them for the period between 2015-2020;
- analyzing the influence of super-terrorism on the destabilization of military and political situations on the regional and global level;
- developing principles and general models of strategic stability for the new situation, applying these models, and developing recommendations on how to lower the influence of destabilizing factors.

Two major destabilizing factors in the nuclear and missile sphere that could significantly lower the strategic stability level are the existence of Israel's nuclear arsenal and the possible emergence of new nuclear nations, such as Iran and North Korea. On February 10, 2005, North Korea made an official statement about possessing nuclear armaments. Clearly, it is very important to examine the nuclear programs of those countries.

A nuclear challenge from the threshold states exacerbates debates and doubts in the international community, not only about the stability of the nonproliferation regime in general, but about the effectiveness of the International Atomic Energy Agency (IAEA), its activities, and its inspection system in particular. Many politicians and experts from the United States, other Western countries, Israel, and South Korea stress that the IAEA safeguards system is not effective enough and simply unsuited for the modern world. Nuclear aspirants have too many political, technical, and other opportunities to evade the monitoring system. New chapters in the nuclear history of North Korea and Iran will be closely linked to the activities of the IAEA and add to the chronicles of the organization.

The IAEA developed new projects to limit acquisition of technologies for reprocessing enriched uranium and plutonium, disclosing treaty violations, and accountability for such violations. The organization is also continuing efforts to improve monitoring system mechanisms. When discussing nuclear programs in Iran and North Korea, it is important to note that according to Article 4 of the NPT⁴ and the IAEA Statute,⁵ a country cannot be denied a right to possess nuclear energy for civilian purposes.

To date, the world community has not adequately responded to North Korea's challenge to the

⁴ *Nerasprostranenie iadernogo oruzhiia. Sbornik dokumentov.* (Nuclear Weapons Non-Proliferation. Collection of Documents). Moscow: Mezhdunarodnye otnosheniia, 1993.

⁵ *Ustav MAGATE. Sovetskii Soiuz v bor'be za razoruzhenie. Sbornik dokumentov.* (The IAEA Statute. The Soviet Union Fighting for Disarmament. Collection of Documents.) Moscow: Politizdat, 1977.

IAEA and the NPT or to its illicit cooperation with other countries in the nuclear and missile spheres. However, increasing military and political instability exacerbated by Iran's uncertain nuclear status requires that all major countries develop a range of political, diplomatic, and technological methods to solve such problems. The process is already underway. On April 28, 2004, the UN Security Council adopted Resolution 1540,⁶ which was introduced by the United States and France. That document reflects the global consensus on the pressing need to reinforce the international nonproliferation regime. The Resolution calls for enhanced security of nuclear weapons and materials, tighter export controls, and new laws to control non-State actors' proliferation activities. The resolution provides for controlling illicit material and technology supplies in accordance with Chapter 7 of the UN Charter that allows the Security Council to use sanctions and military force in response to international security threats.

The development of future crises and global security in general will be influenced by the effectiveness of the approaches chosen to solve the North Korean nuclear problem and the situation in Iran, which divides many members of the UN Security Council.

The Democratic People's Republic of Korea (DPRK)

Developing Nuclear Policy in the DPRK. Since the DPRK was founded in 1948, its defense policy has focused on maintaining and strengthening its military might and offensive potential in the region. The security situation on the Korean peninsula has not become less dynamic nor did the military threat in the Far East diminish as a result of the Korean War (1950-1953) or the Cold War.

For several decades, the national goal of the North Korean military policy has been to unify the peninsula. The North Korean leadership developed that policy based on several fundamental and interrelated concepts for the future of the Korean Peninsula: North Korean dominance in the unified Korea and the possible use of military force during the unification process. To that end, North Korea has long been interested in and made great efforts to develop WMD, particularly nuclear weapons. Apparently, these goals are still important for Pyongyang. However, there is speculation that the North Korean regime may have devised the latest nuclear manifestation in an effort to survive and might attain a certain success as a result of its nuclear blackmail scheme.

Historically, the ambiguity and unpredictability of North Korea's nuclear strategy and tactics have baffled the world community. The country is headed by rational and pragmatic people. The acquisition of WMD components and statements about nuclear weapons development are not based on temerity or indifference to present day events, but rather on a deep understanding of how to best make use of those events.

North Korea's nuclear strategy and specific military plans leave a certain ambiguity due to the difficulty in obtaining reliable information about Pyongyang's motives and intentions. Assessments on North Korea's WMD capabilities carried out by an international roster of experts produced different and even conflicting results. Most notably, US and Russian experts disagree on the issue. The history of the North Korean nuclear program illustrates that such differences in opinions stem from the multiple prisms of physics, technology, politics, strategy, and international law through which the program is viewed.

⁶ UN Security Council documents, www.un.org.

North Korea has always considered WMD to be a necessary part of its military arsenal. North Korea's military cooperation with the Soviet Union and China in the 1950s and 1960s led the DPRK to attempt to develop its own nuclear program. During the Korean War the United States threatened several times to use nuclear weapons. After the war, US forces remained in South Korea in breach of the 1953 armistice. US documents that were declassified in the 1990s prove that US nuclear weapons were deployed on Korean soil.⁷ By 1967, those weapons totaled 950 nuclear warheads of eight different types.⁸ Consequently, North Korea has pursued a nuclear program despite serious economic problems. North Korea has been constantly expanding military applications of its nuclear research and making use of the Cold War confrontation between the nuclear nations. Furthermore, North Korea has used the expression *nuclear weapons* with as much benefit for itself as possible. For several decades, the words *North Korea* have been associated with the term *nuclear weapons*, thus illustrating an extremely dangerous regional and international problem.

Figure 1 illustrates the locations of the key nuclear facilities in the modern North Korea.⁹

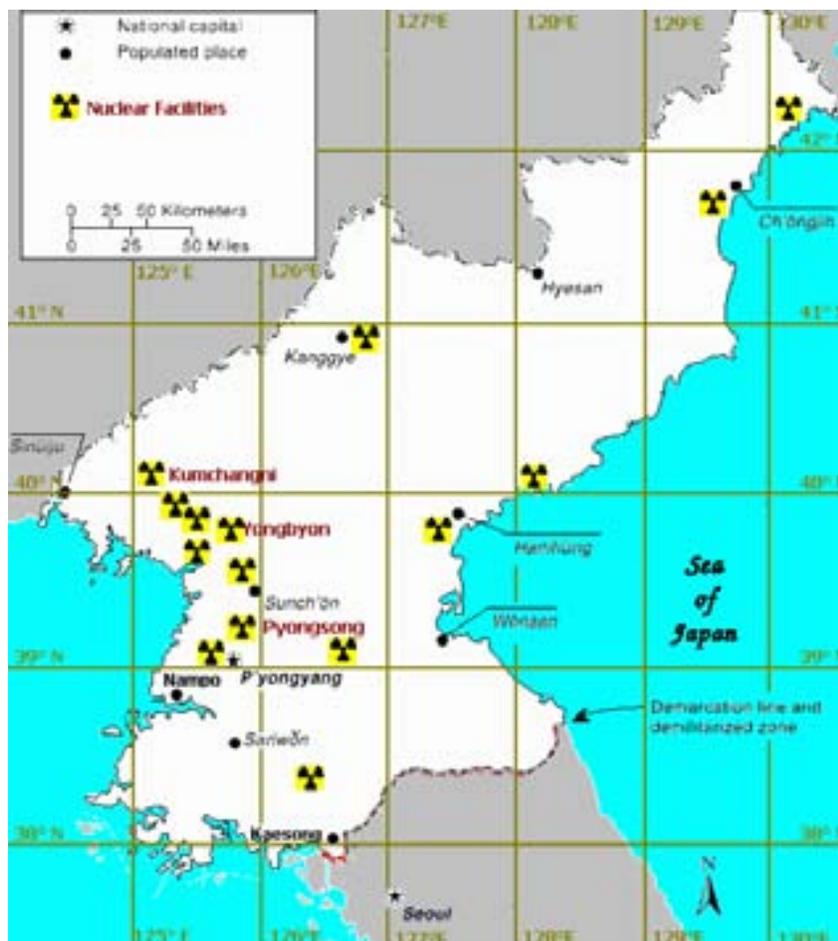


Figure 1: North Korean Nuclear Facilities

⁷ "CINCPAC Document on the Withdrawal of US Nuclear Weapons from Korean Peninsula." The Nautilus Institute. <http://nautilus.org/DPRKbriefingbook/nuclearweapons/koreawithdrawal.PDF>.

⁸ "North Korea's Nuclear Program, 2003." *The Bulletin of the Atomic Scientists*. <http://www.thebulletin.org>.

⁹ Federation of American Scientists. <http://www.fas.org>.

The DPRK embarked on its nuclear program in the mid-1950s. In the 1960s, the USSR helped to launch North Korea's scientific and experimental infrastructure, train essential personnel, and build an industrial base for the civilian nuclear industry. In 1963, construction began on a nuclear center in Yongbyon. In 1986, North Korea began operating a small 5-megawatt (MW) research uranium-graphite reactor categorized as a dual-purpose facility to reprocess plutonium.¹⁰ Whenever the Soviet Union delivered fuel for the facility, the North Korean government would officially offer reassurance that the fuel was used exclusively for civilian purposes. The documents related to these activities are located in the archives of the Federal Atomic Energy Agency (formerly known as the Ministry of Atomic Energy of the Russian Federation).

The USSR also helped set up a Radiochemical Laboratory at the Radiochemistry Institute in North Korea. That laboratory included several hot cells for reprocessing spent nuclear fuel and extracting radionuclides from irradiated fuel assemblies. In addition, the Soviet Union helped establish a nuclear waste site at the Nuclear Scientific Research Center in Yongbyon. All the facilities were safeguarded by the IAEA.¹¹

In the 1980s, work began on two more power reactors, scheduled to become operational in 1995 or 1996, that used Soviet technology. According to Russian experts, the reactors were never completed. It is known that the site chosen and set up for the reactors was later used by the Korean Energy Development Organization (KEDO) to build light-water reactors (LWRs) in accordance with the 1994 Agreed Framework.¹²

Until the mid-1980s, North Korea's nuclear activities caused little concern. Then, the world first learned that North Korea had mastered the production of weapons-grade plutonium, which is necessary to build an atomic bomb.

In December 1985, upon the insistence of the USSR and in exchange for Soviet support for the construction of the two reactors, North Korea signed the NPT.¹³ However, Pyongyang did not give a complete list of its nuclear facilities and materials to the IAEA inspectors nor did it provide access to those facilities, as stipulated by Article 3.1 of the NPT. On January 30, 1992,¹⁴ the DPRK and the IAEA signed the Safeguards Agreement, a draft of which had already been prepared as early as July 16, 1991.¹⁵ North Korea had postponed signing those documents for nearly seven years, an unprecedented event in the history of the NPT. North Korean diplomatic maneuvering in relations with the IAEA continues to this day.

In 1992, North and South Korea signed the Joint Declaration of South and North Korea on Denuclearization of the Korean Peninsula.¹⁶ In May 2003, North Korea announced that the Joint

¹⁰ Timerbaev, R.M.M. *Rossia i iadernoe nerasprostranenie. 1945-1968*. (Russia and Nuclear Non-Proliferation. 1945-1968) Moscow: Nauka, 1999.

¹¹ Foreign Intelligence Service open data. <http://svr.gov.ru>.

¹² Romashkina, N.P. *Severokoreiskaia iadernaia problema: domysly i real'nost'*. (The North Korean Nuclear Problem: Theories and Reality). Vol. 46. January-March 2003. Moscow: Moscow Carnegie Center, 2003.

¹³ The NPT came into force in 1970. It was signed by 187 countries, but not by Israel, India, or Pakistan. In order to accede to the NPT, a country promises to submit its nuclear facilities for safeguards inspections by the IAEA within the first 18 months after signing the NPT.

¹⁴ "The Agreement of January 30, 1992 between the Government of the Democratic People's Republic of Korea and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty of the Non-Proliferation of Nuclear Weapons (INFCIRC/403)." IAEA materials. <http://www.iaea.org>.

¹⁵ "The DPRK and IAEA Secretariat Complete Safeguards Agreement Text. July 16, 1991." Federation of American Scientists. <http://www.fas.org>.

¹⁶ Akhtamzian, I.A., ed. *Iadernoe nerasprostranenie*. (Nuclear Non-Proliferation). Vol. 2. Moscow: PIR-Tsentr,

Declaration was no longer valid.

As the agreement on North Korean nuclear facility inspections between Pyongyang and the IAEA was being implemented, the transparency level of the North Korean nuclear program had increased. Also, the agreement allowed the IAEA to clearly and objectively assess the condition and purposes of the North Korean nuclear program. On January 30, 1992, Director General of the IAEA, Hans Blix, made an official statement about these events.¹⁷ During 1992 and 1993, the IAEA conducted six inspections in North Korea.¹⁸

However, as early as 1992, the North Korean inspections provided no clear conclusions on whether the North Korean government used its nuclear facilities exclusively for civilian purposes. Additionally, the IAEA suspected that North Korea did not submit all its nuclear materials for inspection. For example, there was speculation that North Korea had discharged reprocessed spent fuel at the research power reactor in Yongbyon without declaring the activity. The IAEA estimated that North Korea could produce sufficient plutonium to make one or two bombs. IAEA representatives agreed that the estimate had grounds, since radioactive waste samples and tests in hot cells did not match the reactor's operating regime.¹⁹

In 1993, in response to numerous IAEA requests for inspections during which North Korea could have furnished proof of its innocence, uranium rods were removed from Yongbyon without IAEA inspectors present. Then the DPRK declared its intent to discontinue safeguards implementation on its territory²⁰ and threatened to withdraw from the NPT.²¹ The No-dong-1 missile test was also conducted during this period.

In 1994, North Korea threatened again to withdraw from the NPT. Clearly, North Korea successfully employs the tactics of nuclear blackmail and balancing on the edge of war.

In 1994, after much searching, the IAEA found the facilities that produced plutonium from the spent reactor fuel. This plutonium was suitable for nuclear-weapon programs.²² Not only were IAEA inspectors denied access to one of North Korea's nuclear facilities, North Korea also began to harvest spent nuclear fuel from the research reactor with no international observers present.²³ IAEA experts estimated the spent fuel could contain up to 30 kilograms of plutonium, which could produce five or six atomic bombs. Later, North Korea announced its withdrawal

2002.

¹⁷ "Statement of IAEA Director General at the Signing of a Safeguards Agreement between the IAEA and the Democratic People's Republic of Korea, Vienna, Austria, January 30, 1992." Federation of American Scientists, <http://www.fas.org>.

¹⁸ Cilincione, J. and B. Wolfsthal and M. Rajkumar. *Deadly Arsenal, Tracking Weapons of Mass Destruction*. Carnegie Endowment for International Peace, 2002.

¹⁹ IAEA materials. <http://www.iaea.org>.

²⁰ "INFCIRC/419." Annex 5. March 12, 1993. IAEA materials. <http://www.iaea.org>.

²¹ "INFCIRC/419." Annex 7. March 12, 1993. IAEA materials. <http://www.iaea.org>.

²² "INFCIRC/437." April 14, 1994. "Communications dated March 18 and 19, 1994 Received from the Permanent Mission of the Democratic People's Republic of Korea to the International Atomic Energy Agency." "Statement of March 18, 1994 by a Spokesman for the General Department of Atomic Energy of the Democratic People's Republic of Korea." Attachment 1. IAEA Materials. <http://www.iaea.org>. CIA materials. <http://www.cia.gov>.

²³ "INFCIRC/437." April 14, 1994. "Communications dated March 18 and 19, 1994 Received from the Permanent Mission of the Democratic People's Republic of Korea to the International Atomic Energy Agency." "Memorandum of March 19, 1994 of the General Department of Atomic Energy of the Democratic People's Republic of Korea." Attachment 2. IAEA Materials. <http://www.iaea.org>.

from the IAEA.²⁴ As a result, the United States submitted a proposal to the UN Security Council to sanction North Korea, and since that time the IAEA has monitored North Korea on a limited basis. However, IAEA experts were never admitted into the country to conduct a thorough inspection that would prove or disprove the secret development of nuclear weapons.

As a result of former US President Jimmy Carter's intermediary mission, North Korea agreed to freeze its military nuclear programs and begin negotiations with the United States. Representatives of the two countries reached a compromise. In the fall of 1994, after long negotiations that included IAEA participants, North Korea signed the Agreed Framework between the US and the DPRK.²⁵ The agreement called for freezing and eventually dismantling the uranium-graphite reactors and all related facilities in Yongbyon. In exchange, North Korea would receive 500 tons of heavy fuel oil annually to heat the country's populated areas, and two 1000-MW LWRs. The reactors would not be capable of producing weapons-grade nuclear materials. In the same year, according to the agreement with the IAEA, buildings located on the premises of the non-frozen nuclear facilities were sealed and surveillance cameras installed. In addition, North Korea committed to allow the IAEA to resume its safeguards inspections; to remain a party to the NPT; and to fully comply with the Safeguards Agreement when a significant part of the project would be completed but prior to the shipment of the critical nuclear components.²⁶

A new US administration brought about a change in policy that doomed further events. The provisions of the Agreed Framework with the United States, the goal of which was to resolve the situation, became a reason for yet another North Korean crisis. President George W. Bush stated that he did not believe North Korea²⁷ would fulfill its obligations as provided by the Agreed Framework. In early October 2002, a US delegation left for Pyongyang with a mission to reach a compromise. Upon the group's return to the United States, Secretary of State Colin Powell reported that James A. Kelly, Assistant Secretary of State, had furnished the North Korean authorities with proof that they had been violating the 1994 Agreed Framework.²⁸ In response to the announcement, North Korea made the following appeals to the United States on the subject of the Agreed Framework violations:

- LWR reactor construction in the DPRK is only at the foundation-setting stage, though the LWRs should be completed by 2003 according to Article 1 of the Agreed Framework. The United States has done nothing to normalize political and economic relations with Pyongyang as stipulated by Article 2 on upgrading bilateral relations to the ambassadorial level;
- The United States has not provided any guarantees that it would not use nuclear weapons against the DPRK nor threaten to use such weapons as stipulated by Article 3 of the Agreed Framework;

²⁴ "INFCIRC/447." June 21, 1994. "The Withdrawal of the Democratic People's Republic of Korea from the International Atomic Energy Agency." IAEA materials. <http://www.iaea.org>.

²⁵ "INFCIRC/457." November 2, 1994. "Agreed Framework of 21 October 1994 between the United States of America and the Democratic People's Republic of Korea." IAEA materials. <http://www.iaea.org>.

²⁶ Federation of American Scientists. <http://www.fas.org>.

²⁷ Bureau of International Information Programs of the US Department of State. <http://usinfo.state.gov>.

²⁸ Hersh, Seymour M. "The Cold Test/ What the Administration Knew about Pakistan and the North Korean Nuclear Program." <http://www.newyorker.com>.

- The United States has not concealed its ability to carry out a nuclear attack on the DPRK and continues to promote a doctrine of preemptive strike. When talking about the potential targets of its nuclear preemption, Washington still perceives the DPRK as one of the states in the “axis of evil”;²⁹
- While failing to honor the 1994 Agreed Framework, the United States has made additional demands not included in the original documents. The United States has constantly insisted on conducting inspections in the DPRK, even though the Agreed Framework states that inspections are to begin when a *significant* part of the LWR construction project is completed.³⁰ According to the IAEA data on nuclear energy in Russia, a site for building LWRs had been cleared, a reactor cavity prepared and partially set in concrete.

In response to these claims, various levels of US representatives stated that in October, 2002, North Korean officials admitted to the US delegation that Pyongyang had an ongoing secret nuclear weapons program³¹ intended to circumvent the US-DPRK Agreed Framework.³² According to the United States, that would prove violations of several international documents, including the NPT, IAEA agreements, and the North-South Joint Declaration on Denuclearization of the Korean Peninsula.³³ Officials in Washington, DC, let it be known that the Bush administration would not negotiate in response to threats and agreement violations, nor would it bargain or offer bait enticing North Korea to comply with the agreement that it had signed in the past.³⁴ Negotiations with North Korea could only continue if the DPRK fully complied with its international obligations, liquidated its nuclear weapon programs, and reversed its activities regarding the nuclear reactors.³⁵

According to the Central Intelligence Agency (CIA), the new North Korean nuclear program is based on using enriched uranium³⁶ and partially supported by technologies imported from Russia.³⁷ Russia’s Foreign Intelligence Service claims that during almost three decades of North Korea’s nuclear program, a network of nuclear industry facilities has been established. The following facilities have the potential to be used for military applications:

- a specialized experimental nuclear physics laboratory at the Pyongyang Kim Il Sung University;
- a fuel rod production plant and nuclear waste site at the Nuclear Scientific Research Center in Yongbyon;

²⁹ On January 29, 2002, during his State of the Union Address, President George W. Bush said that Iraq, Iran, North Korea, and their terrorist allies constitute an axis of evil. <http://www.whitehouse.gov/news/releases/2002/01/20020129-11.html>.

³⁰ *Seul’skii Vestnik*, 2000-2003. <http://vestnik.tripod.com>.

³¹ CIA materials. <http://www.cia.gov>.

³² Bureau of International Information Programs of the US Department of State. “Press briefing by the White House Press Secretary Ari Fleischer.” January 10, 2003. <http://usinfo.state.gov>.

³³ Ibid.

³⁴ Bureau of International Information Programs of the US Department of State. “The US Department of State briefing. Statement by the US State Department spokesman Richard Baucher.” January 3, 2003. <http://usinfo.state.gov>.

³⁵ Kessler, Glenn. “US Believes N. Korea Rapidly Seeking Stockpile.” *Washington Post*. February 1, 2003.

³⁶ CIA materials. <http://www.cia.gov>.

³⁷ Center for Arms Control, Energy, and Environmental Studies. Moscow Institute of Physics and Technology. <http://www.armscontrol.ru>.

- a 5-MW nuclear research reactor in Yongbyon;
- a 50-MW nuclear reactor in Yongbyon, which is under construction according to North Korea. (This reactor and the 5-MW reactor are in fact dual-purpose facilities);
- a radiochemical laboratory at the Radiochemistry Institute in Yongbyon;
- a natural uranium 200-MW gas-graphite reactor under construction in Taechon;
- Uranium mines in Pakchon and Pyongsan;
- Sites for the planned construction of three 635-MW power reactors.³⁸

US experts have substantiated most of the same data.³⁹

All facilities established within the framework of cooperation with the USSR are located in Yongbyon, and none of these facilities can be used for a military nuclear program based on highly-enriched uranium (HEU). In 1993, due to the earlier North Korean crisis, the President of the Russian Federation signed a decree that terminated nuclear scientific and technical collaboration between Russia and the DPRK.

According to Russian experts, there are several reasons why North Korea is not very effective in its efforts to develop uranium-based nuclear weapons. First, knowing North Korean capabilities, it is practically impossible to extract enough highly-enriched weapons-grade uranium, since nuclear weapons require large quantities of HEU. Approximately 28 kilograms of HEU is needed to make a single nuclear warhead.⁴⁰ In comparison, one plutonium-based nuclear warhead requires four to eight kilograms of weapons-grade material. However, Russian experts estimate that since North Korean nuclear facilities have existed, they could only have produced enough plutonium to make one to three nuclear warheads. Secondly, in addition to enrichment equipment, which requires much space and consumes huge amounts of energy, many experts are needed to develop various different methods of enriching uranium for nuclear weapons, be it diffusion, centrifuge, laser, or electromagnetic and radiochemical isotope separation. Modern satellite systems can easily trace such facilities.

The following example illustrates the ambiguity of the problem. North Korea has uranium deposits estimated at fifteen thousand tons.⁴¹ Although China has assisted North Korea by providing nuclear scientific and research infrastructure, training personnel, and building production facilities, there is no complete or reliable data on that cooperation. Over the past several years, the Western press reported that Pakistan gave North Korea nuclear weapons production secrets that involved the gas-centrifuge method of enriching uranium, sent necessary equipment and even provided nuclear materials to North Korea in exchange for its tactical missiles. Islamabad has denied these reports. Another major obstacle preventing North Korea's nuclear weapon development is the sophistication of the plutonium implosion-type weapon. Perhaps this explains why Pyongyang has been concentrating on using HEU to build a

³⁸ Foreign Intelligence Service open data. <http://svr.gov.ru>.

³⁹ Cilincione, J. and B. Wolfsthal and M. Rajkumar. *Deadly Arsenal, Tracking Weapons of Mass Destruction*. Carnegie Endowment for International Peace, 2002.

⁴⁰ *Deistvie iadernogo oruzhiia*. (Effects of Nuclear Weapons). Moscow: Voennoe izdatel'stvo Ministerstva oborony SSSR, 1963.

⁴¹ Moltz, James C. and Alexandre Y. Mansourou, eds. *The North Korean Nuclear program*. Routledge, New York and London, 2000.

technologically simpler gun-type nuclear device.

According to the latest data in Western sources, about 22 nuclear facilities are located at 18 North Korean sites.⁴² Some of the facilities could be used for making nuclear weapons based on HEU and there is probably an underground production plant in a tunnel through Mt. Ch'onma, which may even be used to reprocess uranium ore and produce weapons grade uranium.⁴³ Some analysts claim that the facility has been operational since 1989.⁴⁴

The underground complex located in tunnels through the Myohyang Mountains near the Hagap village in the Changang Province may contain nuclear reactors and uranium-enriching facilities.⁴⁵ According to more recent data, the complex is located not in Hagap but rather in the caves of the Kumchang-ni⁴⁶, approximately 50 miles northeast of the Nuclear Scientific Research Center in Yongbyon.⁴⁷ However, US inspections in May 1999 and 2000 were not able to confirm that information.⁴⁸

According to some sources, secret uranium processing and enriching facilities are also located on the sites that had been hollowed out of Kwanmo-bong, the second-highest mountain in the North Hamgyong region.⁴⁹ It should be noted however, that none of the information, which is mostly based on intelligence data, can be considered absolutely reliable.

On January 10, 2003, the North Korean state news agency reported that DPRK officials had made a statement regarding the country's withdrawal from the NPT and its unwillingness to cooperate with the IAEA inspectors. However, North Korea also stated that it had no intentions of producing nuclear weapons. South Korean media reported that according to North Korea's Ambassador in Beijing, Pyongyang was prepared to change its decision to withdraw from the NPT if the KEDO resumes its fuel-oil deliveries.⁵⁰

In the beginning of 2003, a headline in North Korea's official newspaper, *Rodong Shinmun*, proclaimed that a significant delay in nuclear power plant construction by the United States and Washington's refusal to negotiate with Pyongyang had catalyzed North Korea's withdrawal from the NPT.⁵¹ The North Korean government cited President Bush's State of the Union address on January 29, 2002, where he designated Iraq, Iran, North Korea and their terrorist allies as an axis of evil.⁵²

At this point, the question was whether North Korea's withdrawal was official. According to Article 10 of the NPT prior to withdrawing, a party to the treaty must give a three-month notice

⁴² Website materials. <http://globalsecurity.org>.

⁴³ Albright, David and Holly Higgins. "Under Mt. Chun-Ma." *The Bulletin of the Atomic Scientists*. January 2002. <http://www.thebulletin.org>.

⁴⁴ Sokolski, Henry and Victor Gilinsky. "Bush is Right To Get Tough With North Korea." *Wall Street Journal*. February 11, 2002. <http://www.npec-web.org>.

⁴⁵ Northeast Asia Peace and Security Network. "Alleged DPRK Underground Nuclear Facility." *Daily Report*. August 20, 1998. The Nautilus Institute. <http://www.nautilus.org>.

⁴⁶ Priest, Dana. "Activity Suggests N. Koreans building Secret Nuclear Site." *Washington Post*. August 18, 1998.

⁴⁷ "Nuclear Facilities, Kumchang-ni." In *North Korean Special Weapons Facilities*. <http://globalsecurity.org>.

⁴⁸ US Department of State. Statement by James P. Rubin, Spokesman. "Report on the US visit to the site at Kumchang-ni, Democratic People's Republic of Korea." June 25, 1999. <http://globalsecurity.org>.

⁴⁹ Marquand, Robert. "Guerrilla Dynasty, Is It A Threat?" *Christian Science Monitor*. October 30, 2002.

⁵⁰ Interfax Information Agency.

⁵¹ *Sel'skii vestnik*. 2000-2003. <http://vestnik.tripod.com>.

⁵² Bush, George W. *State of the Union Address*. January 29, 2002. <http://www.whitehouse.gov/news/releases/2002/01/20020129-11.html>.

to all other parties and to the UN Security Council. The notice must contain a statement of extraordinary events, which the withdrawing party views as jeopardizing its supreme interests. Despite these clear requirements, in January and February 2003, the DPRK did not hasten to fulfill the necessary steps for its withdrawal from the NPT.⁵³

Two years later, on February 10, 2005, the North Korean Ministry of Foreign Affairs stated that the country had produced nuclear weapons for its defense and would be taking measures to expand its stockpile.⁵⁴ Pyongyang also confirmed its withdrawal from the six-party talks on curtailing its nuclear program.

Perhaps North Korea views a temporary withdrawal for an unspecified period of time rather than a complete withdrawal as a means to gain economic leverage against its neighbors, South Korea and China, in exchange for returning to the negotiating table.

North Korea's interest in economic aid is clearly demonstrated by its May 2005 proposal to resume the bilateral negotiations with the Republic of Korea. That proposal came ten months after Pyongyang had ended negotiations. During the two-day meeting, as North Korea had expected, South Korea attempted to convince the DPRK to resume the six-party talks. Pyongyang called for US participation in discussing North Korean nuclear program. Notably, in April 2005, before taking the necessary steps to return to the negotiating table, North Korea stated that it shut down its nuclear reactor in Yongbyon and was extracting 8000 uranium rods for reprocessing nuclear fuel to make enough weapons-grade plutonium for five to six nuclear warheads.⁵⁵ The day after the reactor was shut down, the US State Department spokesman, Richard Baucher, appealed to the North Korean government to resume negotiations on its nuclear program. North Korea had put on a similar show twice before, each time trying to raise its stakes in the bargaining process.

It is still unclear whether North Korea really possesses nuclear weapons or is simply bluffing. The available data can be interpreted in divergent ways. In any case, an open declaration about possessing nuclear weapons constitutes a stability threat not only for the region, which once again may find itself on the brink of a war, but to the international community. Therefore, the potential for a North Korean nuclear crisis requires further study. Resolving the Korean problem should be a priority for the international community.

North Korean Missile Technologies. North Korea's nuclear program is particularly troubling because the DPRK also has developed missile technologies. North Korean missile capabilities and suspicions about its ballistic missile and missile technology proliferation activities are significantly destabilizing the world: these systems are capable of delivering biological, chemical, and nuclear weapons.

⁵³ Romashkina, N.P. *Severokoreiskaia iadernaia problema: domysly i real'nost'*. (The North Korean Nuclear Problem: Theories and Reality.). Vol. 46. January-March 2003. Moscow: Moscow Carnegie Center, 2003.

⁵⁴ Verstakov, Anton. "Pkhenn'ian igraet vtemnuu." (Pyongyang is Playing in the Dark.) *Vesti.Ru*. February 10, 2005. <http://www.rtr-vesti.ru>.

⁵⁵ "Pkhenn'ian ob"iavlaiet ob iz"iatii uranovykh sterzhnei iz atomnogo reaktora." (Pyongyang's Announcement about Removing Uranium Rods from the Nuclear Reactor.) May 11, 2005. <http://www.interfax.ru>.

North Korea's key missile facilities are illustrated on Figure 2.⁵⁶

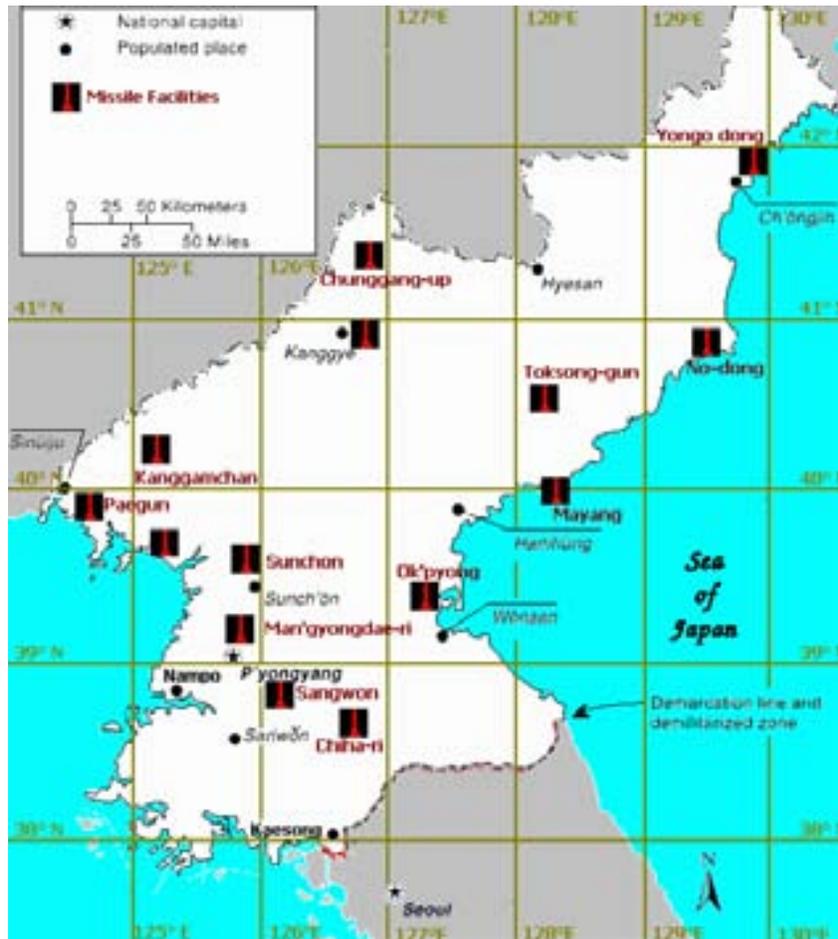


Figure 2: North Korean Missile Facilities

Although North Korea's nuclear plans alarm the US, the prime threat is North Korea's role in ballistic missile and missile technology proliferation. Presumably, all profits from sales of missile technology are directed to funding nuclear weapons programs. In October 2004, John Bolton, then Undersecretary of State for Arms Control and International Security, called North Korea the world's foremost proliferator of ballistic missiles and related technologies to rogue states and hostile regimes.⁵⁷ US experts believe that North Korean missiles carrying nuclear warheads could strike US soil. Russian scientists believe this is a gross exaggeration of North Korea's real capabilities; although it is accepted that North Korea has become one of the largest exporters of missile technologies in the world and continues to assist Egypt, Iran, Yemen, Libya, Pakistan, and Syria to build their own operational missiles.

Experts from the member states of the Missile Technologies Control Regime (MTCR) consider that North Korea has long been one of the more active ballistic missiles developers and has

⁵⁶ Federation of American Scientists materials. <http://www.fas.org>.

⁵⁷ Bolton, John, Undersecretary of State for Arms Control and International Security. "North Korea is the world's foremost proliferator of ballistic missiles and related technologies." October 27, 2004. Washington ProFile Agency. <http://www.usinfo.state.gov>.

distributed not just missile technologies, but missile systems (primarily Scud-based missiles) to the aforementioned nations. These missiles are constantly being modernized to ensure longer range, heavier payload, and greater accuracy. Given the previous statements, one could conclude that North Korea's mission to increase its own offensive capabilities is overshadowed by the commercial objective to attract more potential buyers for ballistic missiles with enhanced offensive features.

The supposed nuclear and missile cooperation between North Korea and Pakistan is crucial. For several years, Western press has carried reports about Pakistan sharing its secrets of producing nuclear weapons using the gas-centrifuge method of enriching uranium, as well as providing equipment and even nuclear material to North Korea. Islamabad has denied these claims; however, Pakistan has received North Korean No-dong missiles, which became the prototypes for the Pakistani short-range missiles (Hatf) and medium-range missiles (Ghauri).⁵⁸

Pyongyang and Islamabad began their missile cooperation in the early 1990s. At that time, Pakistan already possessed the capability for nuclear weapon production using HEU and was seeking the technology to attain delivery systems in an effort to match India's more powerful missile and nuclear potential. Evidence suggests that Pakistan received 12 to 25 ballistic missiles from North Korea.⁵⁹

The missile and nuclear barter deal probably commenced in 1997 and continued through July 2002.⁶⁰ In summer 1999, Western nuclear nonproliferation experts made their first public statements regarding nuclear ties between North Korea and Pakistan.⁶¹ In June 2001, the US Deputy Secretary of State, Richard Armitage, discussed the role played by Pakistan's scientists in North Korea's nuclear program⁶² but for the most part his warnings went unnoticed.⁶³ The issue gained attention only after the events of September 11, 2001. At that time, some Western sources reported that Dr. Abdul Kadeer Khan, a Pakistani scientist who played a key role in creating HEU-based nuclear weapons in Pakistan, had visited North Korea on several occasions with his colleagues, while a group of North Korean scientists observed a bomb test in Pakistan.⁶⁴

That Pakistan received North Korean ballistic missiles can be considered confirmed because open sources reported the time, location, and exact transportation used for delivering missile components which were intercepted by Indian customs in the summer of 1999⁶⁵ and traced by the US intelligence in July 2002.⁶⁶ However, much less is known about Pakistan's deliveries to

⁵⁸ Stober, Dan and Daniel Sneider. "US Knew About Nuclear Link between N. Korea." *Nonproliferation Review*. Fall-Winter, 2002.

⁵⁹ Kampani, Gaurav. "Second Tier Proliferation: The Case of Pakistan and North Korea." *Nonproliferation Review*. Fall-Winter, 2002.

⁶⁰ Ibid.

⁶¹ Filkins, Dexter. "N. Korea aid to Pakistan Raises Nuclear Fears." *Los Angeles Times*. August 23, 1999. <http://www.latimes.com>.

⁶² Stober, Dan and Daniel Sneider, "US Knew About Nuclear Link Between N. Korea, Pakistan." *San Jose Mercury News*. October 17, 2002. <http://www.bayarea.com>.

⁶³ Kampani, Gaurav. "Second Tier Proliferation: The Case of Pakistan and North Korea." *Nonproliferation Review*. Fall-Winter, 2002.

⁶⁴ Hersh, Seymour M. "The Cold Test/ What the Administration Knew about Pakistan and the North Korean Nuclear Program." <http://www.newyorker.com>.

⁶⁵ Joshi, Manoj. "India Refuses to Let N. Korea Off the Hook." *Times of India*. July 31, 1999. <http://www.timesofindia.com>.

⁶⁶ Sanger, David E. "Threats and Responses: Alliances: In North Korea and Pakistan, Deep Roots of Nuclear Barter." *New York Times*. November 24, 2002. <http://www.nytimes.com>.

North Korea. US sources report only that the equipment *possibly* included gas-centrifuge components for extracting highly-enriched, weapons-grade uranium and was likely a part of the barter agreement initiated in the late 1990s between North Korea and Pakistan.⁶⁷

The missile technology cooperation between North Korea and Egypt provides another example of this proliferation. On March 23, 1999, the United States sanctioned three Egyptian companies for passing US dual-purpose technologies and missile components to North Korea.⁶⁸ According to *Jane's Defense Weekly*, in February 2000, several sources cited indications suggesting that Egypt transferred US missile technologies to North Korea. US and Israeli intelligence alleged that Western technology obtained by Egyptian government-owned companies was being sent to North Korea where it was adapted and returned as advanced missile components for Egyptian medium-range ballistic missiles (MRBMs).⁶⁹ According to the same sources, Egypt's arsenal includes Scud-based missiles having a range of 500 kilometers. North Korea is now helping Egypt develop a missile with a 1000-kilometer range.⁷⁰

On August 31, 1998, the DPRK performed a test launch of the Taepo-dong-1 three-stage configuration missile.⁷¹ The ballistic missile fell into the Pacific Ocean after flying over Japan. North Korea announced that it had attempted to launch a small broadcasting satellite using the missile, the third stage of which had a solid-propellant engine. Because of a third-stage malfunction, the satellite was not put in orbit and thus was lost.⁷² Although North Korean experts concentrated on the reliability of the missile stage-separation system and the in-flight function system controls, according to one US theory, the launch was a test of an intercontinental ballistic missile (ICBM) capable of targeting the United States.⁷³ Washington cited North Korea's August 1998 missile threat as a reason for launching the National Missile Defense (NMD).

North Korea's arsenal includes solid-propellant missiles, Frog-7 with a 70-kilometer range and 400-kilogram payload capability; operational tactical missiles Luna-M and operational short-range ballistic missiles (SRBMs) Scud-B with a 320-kilometer range and 1000-kilogram payload capability; and Scud-C SRBMs with a 500-kilometer range and 770-kilogram payload capability.⁷⁴ North Korean output capabilities allow for a yearly production of approximately 100 Scud-type missiles.⁷⁵ In 1996, North Korea began serial production of the No-dong-1 missile that has a maximum range of 1300 kilometers, a payload of up to 770 kilograms and constitutes a cluster of four engines from the Scud missile. According to Japanese experts, this type of missile represents an intermediate point in the process of developing two-stage missiles, Taepo-dong-1 with a 1500 to 2500-kilometer range and a 1000 to 1500-kilogram payload and Taepo-dong-2 with a 3500 to 7700-kilometer range and a 700 to 1000-kilogram payload.

⁶⁷ Sanger, David E. and James Dao. "A Nuclear North Korea: Intelligence; US Says Pakistan Gave Technology to North Korea." *New York Times*. October 18, 2002. <http://www.nytimes.com>.

⁶⁸ CIA materials. <http://www.cia.gov>.

⁶⁹ Ibid.

⁷⁰ "Nuclear Proliferation: North Korea." In *Bulletin of the Atomic Scientists* Special Collections. 2003. <http://www.thebulletin.org>.

⁷¹ Washington ProFile Agency materials. <http://usinfo.state.gov>.

⁷² Katha, T. "The Challenge of Ballistic Missiles in Asia, Asian Security in the 21st Century." International Conference in New Delhi. January 24-25, 2000.

⁷³ Ibid.

⁷⁴ "North Korea's Nuclear Program, 2003." *Bulletin of the Atomic Scientists*. <http://www.thebulletin.org>.

⁷⁵ Katha, T. "The Challenge of Ballistic Missiles in Asia, Asian Security in the 21st Century." International Conference in New Delhi. January 24-25, 2000.

Chinese technologies were used to create Taepo-dong-2 missiles. The three-stage Taepo-dong-3 missile, with an 8000 to 15,000-kilometer range and a 750-kilogram maximum payload, is at the last phase of R&D and testing.⁷⁶

According to some sources, during the 1990s North Korea approved a program to develop a separating re-entry vehicle capable of carrying nuclear and other weapons.⁷⁷ Clearly, this was either an exaggeration or one of North Korea's most ambitious long-term programs. Most experts on missile and nuclear technologies agree that this would be an unlikely step for North Korea for several reasons, which include high costs, the extended time required to develop projects, the need for highly qualified nuclear and missile scientists, and the employment of new technologies. North Korea's limited resources deter planning and adopting such programs.

In 1998, the North Korean government announced its intentions to continue developing, testing, producing, and maintaining its missile armaments. North Korea hoped this action would enhance the country's regional and global political status, remove trade and economic barriers, leverage its military potential to its advantage during unification negotiations with South Korea, and improve its economic situation.⁷⁸

In March 2005, Pyongyang removed the self-imposed, six years old long-range ballistic missile test moratorium. According to the North Korean Ministry of Foreign Affairs, hostile US policies influenced the decisions both on the moratorium and on the production of nuclear weapons.⁷⁹

Nuclear Capabilities of the DPRK. North Korea's real nuclear capabilities constitute one of the main questions on the international agenda.

Russian experts believe it unlikely that North Korea possesses either nuclear weapons or the capability to produce them quickly should they be determined politically necessary. In 2003, Russia's Minister of Atomic Energy, Aleksandr Rumiantsev, stated, "We have little data on the subject as we have not cooperated with North Korea in the field of advanced nuclear technologies for the past ten years. We regret that fact. But I think North Korea has a long path to nuclear weapons."⁸⁰

Russian nuclear scientists don't believe that North Koreans have sufficient weapons-grade plutonium, necessary equipment, scientists, and financial resources to make even one or two plutonium-based nuclear bombs, let alone uranium-based nuclear bombs. For several decades, the plutonium-producing research reactor and the spent-fuel waste site, both built with Soviet support, raised concerns and suspicions about North Korean nuclear weapons. Consequently, Russian scientists' opinions on the subject are valuable.

Even before the Soviet Union broke apart and the nuclear-energy contracts between the two countries were terminated, Soviet media reported that on February 27, 1990, the KGB Chairman, Vladimir Kriuchkov, told the Politburo of the CPSU Central Committee, "According to our findings, the development of the first nuclear weapon has been completed at the DPRK Nuclear

⁷⁶ "Draft Report of the National Security Advisory Board on Military and Nuclear Doctrine of the North Korea." August 2001.

⁷⁷ *Seul'skii vestnik*. 2000-2003. <http://www.vestnik.tripod.com>.

⁷⁸ Ibid.

⁷⁹ "KNDR." (DPRK). *Nezavisimaia gazeta*. March 4, 2005.

⁸⁰ Vaganov, A. "Moskva ne verit v atomnuu bombu Pkhen'iana." (Moscow Does not Believe in Pyongyang's Atomic Bomb.) *Nezavisimaia gazeta*. January 13, 2003.

Scientific Research Center in the city of Yongbyon located in North Pyongan Province. In the interest of concealing North Korean nuclear production from the global community and international monitoring organizations, no testing of the device is planned at this time. The KGB is taking additional measures to verify the information.”⁸¹

Keeping in mind the worst-case scenario, Western experts hold a different opinion. In 1996, US researchers wrote that in over 40 years of developing its nuclear program, North Korea acquired all the necessary technologies, personnel, and infrastructure to produce nuclear weapons comparable to the early US and Soviet atomic bombs.

CIA data indicates that prior to signing the 1994 Agreed Framework with the United States, North Korea possessed enough plutonium to produce one or two nuclear bombs.⁸² Other analysts estimated the country to have sufficient potential to produce five or six bombs.⁸³ In 1996, US researchers wrote that in over 40 years of developing its nuclear program, North Korea acquired all the necessary technologies, personnel, and infrastructure to produce nuclear weapons comparable to the early US and Soviet atomic bombs. Evidence indicates North Korea planned to produce 10 to 20 nuclear weapons by the year 2000.⁸⁴

Other estimates suggest the DPRK can produce up to 275 kilograms of plutonium every year.⁸⁵ If this were the case, its stockpiled plutonium would be sufficient to produce 30 to 50 nuclear warheads.⁸⁶ There is little doubt that approximately 25 kilograms of weapons-grade plutonium is now stored at one of the storage sites in North Korea.⁸⁷ In February 2003, IAEA experts revealed Pyongyang had stockpiled enough nuclear fuel and technologies to produce several atomic bombs in a matter of months.

Some US researchers agree with Russian scientists. Selig S. Harrison, director of the Asia Program at the Center for International Policy in Washington and a leading expert on Korea, believes the rate of WMD production in North Korea has been greatly exaggerated. No accurate information is available on whether the country possesses the equipment needed to produce nuclear weapons. Officially, production facilities have been frozen since 1994. A more pertinent discussion would be whether North Korea has potential to produce nuclear weapons. As previously noted, North Korea has historically used that potential for political bargaining.⁸⁸

⁸¹ *Argumenty i fakty*. March 20, 1992. *Izvestiia*. June 24, 1994.

⁸² CIA materials. <http://www.cia.gov>.

⁸³ Gibni, James. “Pkhenn’ian vooruzhen, a znachit, opasen.” (Pyongyang is Armed and Dangerous.) *Nezavisimaia gazeta*. January 24, 2003.

⁸⁴ Jane’s Intelligence Review. “North Korea’s Nuclear Arsenal.” Jane’s Information Group Ltd, 1996.

⁸⁵ According to the 2003 estimates of the Carnegie Endowment for International Peace, North Korea possibly possesses 190 kilograms of weapons-grade plutonium. According to the Federation of American Scientists, the nuclear reactors in Yongbyon and Taechon have outputs of 50 MW and 200 MW. That would allow production of up to 200 kilograms of plutonium according to Larry A. Niksch (“North Korea’s Nuclear Weapons Program.” *Congressional Research Service Reports. Foreign Affairs, Defense, and Trade Division*. January 22, 2003) or 275 kilograms of plutonium, according to the CIA Estimate for Congress. “North Korean Nuclear Weapons.” November 19, 2002.

⁸⁶ Niksch, Larry A. “North Korea’s Nuclear Weapons Program.” *Congressional Research Service Reports. Foreign Affairs, Defense, and Trade Division*. January 22, 2003.

⁸⁷ Vaganov, A. “Moskva ne verit v atomnuiu bombu Pkhenn’iana.” (Moscow Does not Believe in Pyongyang’s Atomic Bomb.) *Nezavisimaia gazeta*. January 13, 2003.

⁸⁸ Suslov, D. “Ataka na Severnuiu Koreiu vozmozhna.” (An Attack on North Korea is Possible.) *Nezavisimaia gazeta*. February 5, 2003.

In January 2004, Siegfried Hecker, a scientist at the Los Alamos Laboratory, visited North Korea's Nuclear Research Center in Yongbyon. He noted in his post-visit report that North Korean officials asserted that their country possesses nuclear deterrence potential.

They cited US actions as the reason for increasing the number and quality of the stockpile. US scientists consider that a credible deterrent has at least three components: the ability to make nuclear fuel, namely, plutonium; the ability to design and build a nuclear device; and the ability to integrate the nuclear device into a delivery system. "What we saw at Yongbyon was that they apparently have the capability to do the first. However, I saw nothing and talked to no one that allowed me to assess whether or not they have the ability to design a nuclear device. And, of course, we were not able to assess the integration of it into a delivery vehicle."⁸⁹

In this context, we should remember that the most serious obstacle for North Korea is the sophistication of the implosive-type plutonium device. Because of this, Pyongyang has been concentrating on using HEU for building less complex, gun-type devices.

Kim Jong-il, Chairman of the National Defense Commission, heads the Nuclear Program in the DPRK.

North Korean nuclear infrastructure components⁹⁰ are illustrated on Figure 3.

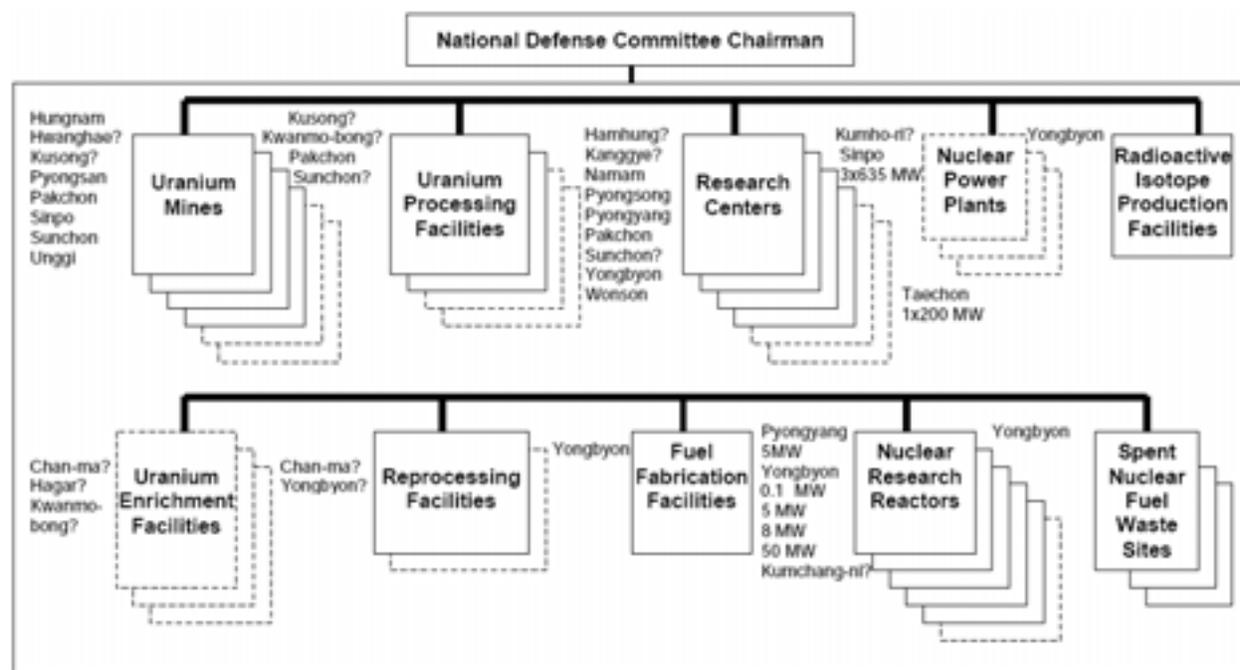


Figure 3: Nuclear Infrastructure of the DPRK

It is likely that none of the world's leading intelligence agencies can accurately estimate the nuclear capabilities of the DPRK. North Korea has always been, and remains to this day, a

⁸⁹ Senate Committee on Foreign Relations Hearing on "Visit to the Yongbyon Nuclear Scientific Research Center in North Korea," Siegfried S. Hecker, Senior Fellow, Los Alamos National Laboratory, University of California. January 21, 2004. Federation of American Scientists materials. <http://www.fas.org>.

⁹⁰ Jane's Intelligence Review. "North Korea's Nuclear Arsenal". Jane's Information Group, Ltd. 1996. Federation of American Scientists materials. <http://fas.org>. and <http://globalsecurity.org>.

closed country, where it is most difficult to obtain any intelligence data, let alone data on the country's classified programs.

Islamic Republic of Iran

Developing Iran's Nuclear Policy. The history of Iran's nuclear efforts is almost as long as the nuclear programs of India and Pakistan. As early as 1957, Iran and the United States signed a civilian nuclear cooperation agreement within the framework of the Atoms for Peace program. The program was initiated after US President Dwight D. Eisenhower addressed the UN General Assembly in 1953. The United States offered Iranian nuclear plants, equipment, and training for their specialists in return for the right to monitor and inspect nuclear facilities.⁹¹

By 1967, the United States provided support for constructing a 5-MW research reactor at Tehran University's Department of Physics' Nuclear Research Center. The reactor, which became operational in 1968, was capable of producing up to 600 grams of plutonium every year.⁹² The reactor was to run on 93 percent enriched uranium fuel. In 1987, the IAEA provided \$5.5 million to modernize the reactor and lower the uranium enrichment to 20 percent. Later, Argentina's National Nuclear Energy Commission supplied the reactor with 115.8 kilograms of such uranium.⁹³ In 1967, the United States delivered equipment and 1.2 kilograms of plutonium for the hot cells used to isolate plutonium from the spent nuclear fuel.⁹⁴

Iran signed the NPT in 1968 and ratified it in 1970.⁹⁵ The IAEA Safeguards Agreement came into force in 1974.⁹⁶

In the 1970s, Iran's Shah Mohammed Reza Pahlavi stressed the importance of nuclear energy development to his country. Hundreds of Iranian experts were educated at leading universities in the West, including US universities—Iran was, at that time, one of the principal US allies in the Persian Gulf region. Other Western countries, especially West Germany and France, actively developed Iran's nuclear program.⁹⁷

In contrast to the situation today, in the mid-1970s, the United States did not object to the nuclear program in Iran, nor did it express any concerns about Iran's establishing a closed nuclear fuel cycle. Today Iran is capable of enriching uranium and producing plutonium by radiochemical reprocessing of the spent nuclear fuel. Thus, the country has two key components for establishing a closed nuclear fuel cycle, a necessary scientific and technical requirement for

⁹¹ Cordesman, Anthony H. and Arleigh A. Burke and G. Ryan Faith. *Iran's Search for Weapons of Mass Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects*. Center for Strategic and International Studies. August 7, 2003.

⁹² Zadonskii, S. M. *Iadernaia programma Irana i rossiisko-amerikanskije otnosheniia*. (Iran's Nuclear Program and Russian-American Relations.) Moscow: Institut izucheniia Izrailia i Blizhnego Vostoka, 2002.

⁹³ Ibid.

⁹⁴ Draft Report of the National Security Advisory Board on Iranian Doctrine. August 2001.

⁹⁵ Akhtamzian, I. A., ed. *Iadernoe nerasprostranenie*. (Nuclear Non-Proliferation). Vol. 2. Moscow: PIR-Tsentr, 2002.

⁹⁶ "INFCIRC/214." The text of the Agreement between Iran and the Agency for the application of safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons. December 13, 1974. IAEA materials. <http://www.iaea.org>.

⁹⁷ Delpesch, Therese and S. Dingli, S. L. Freedman, C. Grand, R. A. Manning, H. Muller, et al. *Nuclear Weapons: A New Great Debate*. Edited by Burkard Schmitt. Paris: Institute for Security Studies, July 2001.

developing nuclear weapons.

US National Security Council (NSC) documents prove that in the course of negotiations, the United States offered aid to Iran with the following conditions:

- Iran would produce nuclear fuel from US imported nuclear source materials;
- the radiochemical facility for reprocessing spent nuclear fuel would be built and operated on a multinational basis;
- Pakistan and Iran would jointly operate the nuclear reprocessing facility, in return for Iran's agreement not to build its own reprocessing plant.⁹⁸

In 1974, a French company, Techniatom, launched the construction of the Isfahan Nuclear Technology Center, a facility intended to train personnel directly involved in operating the nuclear power plant.⁹⁹

According to the 1974 nuclear energy development plan, Iran was to complete the construction of 23 nuclear power generating units with West German, French, and US support.¹⁰⁰ The Atomic Energy Organization of Iran (AEOI)¹⁰¹ was created. Its director reported to the Shah, and after the Islamic revolution to Iran's president. The organization's goals were to use nuclear energy to satisfy the country's energy demands; to acquire technologies needed to build nuclear reactors and establish a closed nuclear cycle; to use nuclear technologies in industry, medicine, and agriculture; and to protect people and the environment from the effects of radiation.¹⁰²

Tehran was already exploring the possibility of supplying its own nuclear fuel for the future nuclear power plants. Consequently the government conducted extensive geological surveys searching for uranium ore deposits. The country intended to begin mining and reprocessing uranium, thus producing nuclear fuel.

Iran negotiated with foreign partners to acquire enrichment technologies and equipment. For instance, negotiations with France resulted in the purchase of a uranium-enriching plant and spent nuclear fuel reprocessing facilities. In 1974, the AEOI paid \$1 billion to the international consortium Eurodif for 10 percent of the stock in a gas-diffusion uranium-enrichment plant being built in Tricastin, France. The same year, Iran signed a contract with a German company, Siemens KWU, to build a nuclear power plant with two 1300-MW reactors close to Bushehr in southern Iran. In 1976, France and Iran signed an agreement concerning France's participation in constructing a nuclear power plant with two 950-MW reactors in the city of Ahvaz on the Karun

⁹⁸ Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire.* (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovanii, 2003.

⁹⁹ Zadonskii, S. M. *Iadernaia programma Irana i rossiisko-amerikanskie otnosheniia.* (Iran's Nuclear Program and Russian-American Relations.) Moscow: Institut izucheniia Izrailia i Blizhnego Vostoka, 2002.

¹⁰⁰ Cordesman, Anthony H. and Arleigh A. Burke and G. Ryan Faith. *Iran's Search for Weapons of Mass Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects.* Center for Strategic and International Studies. August 7, 2003.

¹⁰¹ Zadonskii, S. M. *Iadernaia programma Irana i rossiisko-amerikanskie otnosheniia.* (Iran's Nuclear Program and Russian-American Relations.) Moscow: Institut izucheniia Izrailia i Blizhnego Vostoka, 2002.

¹⁰² Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire.* (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovanii, 2003.

River.¹⁰³ Qualified nuclear experts were to be trained in the United States, Belgium, the United Kingdom, West Germany, Italy, Switzerland, and France.¹⁰⁴

Iran predicted that the two power generating units at the Bushehr nuclear power plant would become operational in 1980 and 1981, respectively, whereas the power generating units in Ahvaz would go on-line in 1983 and 1984.¹⁰⁵ The entire nuclear project was to be implemented by 1994.¹⁰⁶

Had that project, then the most ambitious in the region, been fully realized, the Soviet Union would have had a neighbor with practically all scientific and technical means to produce nuclear weapons. In 1976, as France prepared to provide Iran with a spent nuclear fuel reprocessing plant that isolated plutonium, the Ministry of Foreign Affairs of the Soviet Union contacted France.¹⁰⁷

The 1979 Islamic Revolution and the ascendancy of the Shiite clergy headed by Ruhollah Mousavi Khomeini stalled Iran's ambitious plans. Ayatollah Khomeini's policy toward the West caused the United States, West Germany, and France to cease their direct nuclear cooperation with the Islamic Republic of Iran and most nuclear experts left the country.

The first power generating unit of the nuclear power plant in Bushehr was 90 percent complete, and more than 60 percent of the equipment had been installed. The other power generating unit at Bushehr was 40 to 75 percent complete, depending on the source of information. However, both units were practically demolished by Iraqi air raids during the Iran-Iraq War.¹⁰⁸ The site for the nuclear power plant was completed in Ahvaz. The research reactor at the Tehran Nuclear Research Center was operational and hot cells were built and equipped.¹⁰⁹ Although the uranium-enrichment plant in Tricastin, France, became operational in 1979, Iran did not gain access to this technology.¹¹⁰

As a result of these events, Iran remained a country with no developed nuclear infrastructure in the late 1980s. At that point, the government of Iran decided to resume its nuclear program and began considering the possibility of establishing scientific and technical bases for nuclear weapons development.

¹⁰³ Draft Report of the National Security Advisory Board on Iranian Doctrine. August 2001.

¹⁰⁴ Delpuch, Therese and S. Dingli, S. L. Freedman, C. Grand, R. A. Manning, H. Muller, et al. *Nuclear Weapons: A New Great Debate*. Edited by Burkard Schmitt. Paris: Institute for Security Studies, July 2001.

¹⁰⁵ Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire*. (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovanii, 2003.

¹⁰⁶ Cordesman, Anthony H. and Arleigh A. Burke, and G. Ryan Faith. *Iran's Search for Weapons of Mass Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects*. Center for Strategic and International Studies. August 7, 2003.

¹⁰⁷ Timerbaev, R. M. "Blizhnii Vostok i atomnaia problema." (The Near East and Nuclear Problem.) *Iadernyi kontrol'*. no. 3 (Fall 2003). Moscow: PIR-Tsentr, 2003.

¹⁰⁸ During the Iran-Iraq War of 1980-1988, Iraq conducted six air raids of the nuclear complex in Bushehr. As a result of the last air raid in 1987, both reactors were severely damaged. Afterwards, Iran sealed the structures with metal encasings.

¹⁰⁹ Cordesman, Anthony H. and Arleigh A. Burke, and G. Ryan Faith. *Iran's Search for Weapons of Mass Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects*. Center for Strategic and International Studies. August 7, 2003.

¹¹⁰ Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire*. (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovanii, 2003.

Iraq was at the heart of Iran's decision to launch its nuclear weapons program. The 1980-1988 war with Iraq underscored Iran's military weakness and vulnerability. Iran could not retaliate against Iraqi missile strikes and chemical attacks. However, nuclear weapons could have given Iran an opportunity to counter Iraq.

In addition, nuclear weapons could play an important role in Iran's relations with the United States, considering the critical situation in the Persian Gulf. Iran believes a major US presence in the region could pose a threat to the country's security.

Finally, Iran's nuclear weapons could counterbalance Israel's nuclear capabilities. That has become especially pressing now, since Iraq no longer poses a threat to Iran. The role of the nuclear factor is a subject of many debates in the Greater Middle East. The outcomes of these debates are quickly projected onto the strategic situation in that unstable region.¹¹¹

On October 15, 2004, two international publications, the *World Tribune* and *Middle East Newslines* reported that Israeli submarines carrying missiles equipped with nuclear and thermonuclear warheads could approach the shores of the Persian Gulf. A German newspaper, *Die Welt*, had already reported that Egypt was allegedly striving to acquire nuclear weapons by buying enriched uranium from China. Egypt, China, the United States, and Israel denied the report. Israeli government officials stated that they had no proof that Egypt was interested in buying enriched uranium or producing unconventional weapons. The United States accused *Die Welt* of circulating misinformation and called the article a nuclear hoax. However, according to the *Middle East Newslines*, experts admitted in a report prepared for the US Air Force that for the first time Israel had built its own hydrogen bomb. One of the report's authors, Col. Warner Farr, claimed Israel had over 400 nuclear and thermonuclear weapons, with which it intended to equip three Dolphin submarines purchased from Germany. Col. Farr believed that the nuclear race in the Middle East was about to undergo a transformation because Israel would be able to retaliate. He suggested that since Oman unofficially maintained relations with Israel and is located strategically close to Iran, it could be the future location of the subs.¹¹²

The chain-reaction principle plays a significant role in this scenario. The Arab nations of the Persian Gulf are concerned about Israel's nuclear and missile arsenals and Iran's nuclear ambitions. Tariq Ahmed al-Haidan, the United Arab Emirates Ambassador to Russia, who in 2004 defended a dissertation entitled *Security Problems in the Persian Gulf Region*, considers Iran's possessing nuclear weapons as less threatening to its neighbors than its intention to acquire such weapons. In his opinion, Russia could become an important stabilizing factor in the region if it will act responsibly in its nuclear cooperation with Iran.¹¹³

In the 1980s, after the West refused to provide nuclear aid to Iran, the country began to search actively for ways to approach the Soviet Union, North Korea, India, Argentina, and other nations. Iran wanted to gain access to the countries' nuclear technologies and scientific research. Presently, Iran cooperates with China, North Korea, Russia, and the CIS countries.¹¹⁴

Russia and the United States have divergent views on civilian nuclear energy cooperation

¹¹¹ Romashkina, N. P. "Iadernaia mnogopoliarnost' kak novyi faktor strategicheskogo balansa." (Nuclear Multipolarity as a New Factor of Strategic Balance.) *Mirovaia ekonomika i mezhdunarodnye otnosheniia*. No. 8 (August 2003). Moscow: Nauka/Interperiodika, 2003.

¹¹² Shumilin, Aleksandr. "V mire letiat 'iadernye utki'." (Nuclear Hoax in the World.) *Izvestiia*, October 19, 2004.

¹¹³ Andreenko, Anton. "Iran i uran." (Iran and Uranium). *7 dnei*. August 26, 2004.

¹¹⁴ Draft Report of the National Security Advisory Board on Iranian Doctrine. August 2001.

between Russia and Iran, future prospects of that cooperation, and its effect on Iran's nuclear-weapon production capabilities.

In 1989, the Soviet Union approved a long-term program of economic and trade cooperation with Iran. The program extended to 2000 and specifically called for future increases in Iran's electric power production.¹¹⁵ In 1991, Iran stated its willingness to allow IAEA inspectors access, not only to all of its declared sites, but also to any other facilities, centers, and laboratories that might raise suspicion about their possible undeclared activities.¹¹⁶ The statement was made as a response to US suspicions about the direction of the Iranian nuclear program. In February 1992, IAEA inspectors visited several facilities, which were not included in the original list of declared sites, and found no violations.¹¹⁷ Further IAEA inspections also did not reveal any undeclared or clandestine nuclear activities. Also, in November 1993, no violations were found when a delegation of IAEA inspectors surveyed the facilities in Isfahan, Karaj, and Tehran. In July 1997, then IAEA Director General Hans Blix visited two new nuclear research centers in Iran. One was a food preservation facility in Bonab that used radioactive isotopes and the other was a research center in Ramsar that conducted studies on above-average levels of natural radioactivity. According to IAEA communications, no undeclared or clandestine nuclear activities were discovered at the facilities. In May 2000, IAEA Director General Mohammed ElBaradei visited Iran. In his statement, he said that Iran's nuclear program had a civilian purpose and complied with international requirements and standards.¹¹⁸

In August 1992, the governments of Russia and Iran signed an agreement, severely criticized in the West, to construct a nuclear power plant in Iran. The agreement provided that Russia and Iran would cooperate on operating and building a turn-key nuclear power plant that would consist of two power generating units of average output capacity, with a possibility of expanding to four power generating units and VVER reactors. An educational center for the training and continuing education of personnel was included within the framework of cooperation. Iran guaranteed that nuclear materials, equipment, and components imported from Russia or materials and components built with Russian use would not be used to produce nuclear weapons or other nuclear devices or to achieve any military goals. In addition, they would be controlled by the IAEA Safeguards Agreement over the entire course of their operation.¹¹⁹

In April 1993, Iran ratified the agreement, which served as a legitimate base for implementing the contracts. As a result, on January 5, 1995, the following documents were signed in Tehran:

- a contract to complete construction of the first 1000 MW power generating unit of the

¹¹⁵ Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire.* (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovanii, 2003.

¹¹⁶ Zobov, A. "Bezopasnost' Rossii, Iran i amerikanskii sanktsii." (Russia's Security. Iran and American Sanctions.) Special Addition to *Iadernoe rasprostranenie*. no. 1 (2001). Carnegie Endowment for International Peace, 2001.

¹¹⁷ "INFCIRC/406." Communication received from the Islamic Republic of Iran. July 14, 1992. IAEA materials. <http://www.iaea.org>.

¹¹⁸ Zobov, A. "Bezopasnost' Rossii, Iran i amerikanskii sanktsii." (Russia's Security. Iran and American Sanctions.) Special Addition to *Iadernoe rasprostranenie*. no. 1 (2001). Carnegie Endowment for International Peace, 2001.

¹¹⁹ "Agreement between the Russian Federation and the Islamic Republic of Iran on Cooperation in Building a Nuclear Power Plant in Iran." Information system *Konsul'tantPlus*. Database *Mezhdunarodnoe pravo*. August 25, 1992.

Bushehr nuclear power plant.¹²⁰ The contract was signed by representatives of Zarubezhatomenergostroi and the AEOI. The power generating unit was scheduled to be in operation in 2004 or 2005.¹²¹

- Viktor Mikhailov, the Russian Federation's Minister of Atomic Energy, and Reza Amrollahi, the Vice President of the Islamic Republic of Iran and President of the AEOI, signed a Protocol of Intentions.

Iran was to pay 80 percent of the contracts' value in currency and 20 percent in product. The estimated cost of constructing the first power generating unit alone was \$800 million, and upon delivery of three more power generating units, the total cost would be \$3 to \$3.5 billion.¹²² Naturally, Russia, with a large amount of money involved in the contracts, views its cooperation with Iran as most promising.

The West criticized several aspects of the Protocol's provisions after they became known. Among the criticisms were concerns about:

- building low-power 1 MW reactors to train Iranian scientists;
- the potential of cooperation to construct a desalination plant;
- employing large numbers of Iranian personnel at jointly built facilities, especially to complete construction of the first power generating unit of the Bushehr nuclear power plant;
- supplying fuel at market price to the first power generating unit of the Bushehr nuclear power plant;
- assuring, at minimum, regular yearly meetings of the leading officials from the Russian Ministry of Atomic Energy and the AEOI to ensure operative control of the cooperation efforts and monitor the progress of the first power generating unit at the Bushehr nuclear power plant.¹²³

By the early 1990s, Iran had expressed interest in Russian equipment to construct a gas-centrifuge plant.¹²⁴ Viktor Mikhailov, the Minister of Atomic Energy of the Russian Federation, tentatively agreed to include in the 1995 Protocol of Intentions a contract to construct such a plant that would include developing a uranium mine, and training Iranian specialists in Russia.

¹²⁰ Since the exact text of the contract is a commercial secret, at first, experts diverged in their opinions as to the content of the contract. Later, it became known that Russia was awarded the contract for completing the construction of the nuclear power plant and installing a 1000-MW Russian reactor. Russia was to supply Iran with three more reactors: one 1000-MW reactor and two 440-MW reactors. In September 2002, Iranian government announced about its plans to build a nuclear power plant with a total output of 6000 MW within the next 20 years. Novikov, V.E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire*. (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovani, 2003.

¹²¹ Timerbaev, R. M. "Blizhnii Vostok i atomnaia problema." (The Near East and Nuclear Problem.) *Iadernyi kontrol'*. no. 3 (Fall 2003). Moscow: PIR-Tsentr, 2003.

¹²² Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire*. (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovani, 2003.

¹²³ Ibid.

¹²⁴ Lavoy, Peter R. and S. D. Sagan, and J. J. Wirtz. *Planning the Unthinkable: How New Powers Will Use Nuclear, Biological, and Chemical Weapons*. Ithaca, NY: Cornell University Press, 2000.

Because of the US protests expressed during the May 1995 summit, Russia responded that the Protocol was strictly a working document that had not been approved by the Russian government. Subsequently, the tentative agreements were eliminated from the cooperation plans between Russia and Iran.¹²⁵

According to Russian experts, the Iranian-Russian agreement to construct the first power generating unit of the Bushehr nuclear power plant met all requirements established by the NPT and the IAEA Safeguards system and would be carried out in compliance with Russia's international nuclear-nonproliferation obligations. Moreover, the spent fuel was to be shipped back to Russia.¹²⁶ In order to ensure safe operation of nuclear facilities Russia wanted to train Iranian specialists. Finally, Russia stressed that double standards in nuclear cooperation should not be permitted and cited US-North Korean cooperation to begin construction after signing the 1994 Agreed Framework.¹²⁷ However, the United States protested the Russian-Iranian nuclear cooperation, basing its protest on the nuclear ambitions of Iran's government.¹²⁸

The controversial nuclear relationship between Russia and Iran has raised international eyebrows for many years. Russia asserts that the projects implemented under the Russian-Iranian nuclear cooperation agreement do not fall in the critical nuclear-production category. Russia hasn't provided Iran with technologies for uranium enrichment, plutonium recovery, or building breeder-reactors and the cooperation has been strictly complied with Russia's national laws and international obligations.¹²⁹ If Russia withdrew from the cooperative agreements, its economic and political status could be damaged.

Russia has a large stake in the nature of Iran's intentions regarding nuclear weapon development. Iran is a sizeable presence on Russia's southern flank. If Iran decided to produce a nuclear weapon (and assuming it had a delivery system), Russia could face a real threat, especially given the unpredictable nature of Iran's government. In addition, the Middle East peace process would be undermined. Thus, Iran wants to pursue a strategic cooperation partnership with Moscow, Russia wants to be assured that Iran will be its partner in the region. Considering Russia's difficult relations with Turkey, developing good relations with Iran could be especially beneficial. Russia must also check the spread of Tehran's influence in Central Asia, which Russia still considers vitally important to its interests. Consequently, the prime benefit that Russia can derive from cooperation with Iran is strategic; any economic benefit is secondary.

US officials and many other experts believe that Russian-Iranian nuclear cooperation will result in Iran having its own nuclear weapons, an outcome that would undermine the NPT.¹³⁰

¹²⁵ Orlov, V. A. and R. M. Timerbaev and A. V. Khlopkov. *Problemy iadernogo nerasprostraneniia v rossiisko-amerikanskikh otnosheniakh: istoriia, vozmozhnosti i perspektivy dal'neishego vzaimodeistviia*. (Nuclear Non-Proliferation Issues in Russian-American Relations: History, Possibilities, and Prospects for Further Cooperation.) Moscow: PIR-Tsentr, 2003.

¹²⁶ Iran News. <http://www.iran.ru>.

¹²⁷ Timerbaev, R. M. "Blizhnii Vostok i atomnaia problema." (The Near East and Nuclear Problem.) *Iadernyi kontrol'*. No. 3 (Fall 2003). Moscow: PIR-Tsentr, 2003.

¹²⁸ On September 28, 2003 during a session of the Steering Committee of the 2005 NPT Conference, the US Assistant Secretary of State for Nonproliferation John Wolf stated that Iran represents the most significant challenge the NPT ever faced. *Arms Control Today*. May 2003.

¹²⁹ Timerbaev, R. M. "Blizhnii Vostok i atomnaia problema." (The Near East and Nuclear Problem.) *Iadernyi kontrol'*. No. 3 (Fall 2003). Moscow: PIR-Tsentr, 2003.

¹³⁰ Desutter, Paula A. *Denial and Jeopardy: Deterring Iranian use of NBC weapons*. Washington, D.C.: National Defense University Press, 1997.

The European Union is another player in resolving Iran's nuclear problem. The EU member countries have both political and economic interests at stake that motivate them to reach an agreement. In October 2004, France, Germany, and the United Kingdom offered to cooperate with Iran in the nuclear sphere. They guaranteed reliable fuel deliveries for the nuclear power plant and promised their help in constructing a LWR if Iran would agree to forego uranium enrichment. In accordance with the proposal, Iran would develop trade relations with the Europeans and even accede to the World Trade Organization (WTO).¹³¹ Despite the statement by Alaeddin Brujerdi, head of the Iranian Parliament's National Security and Foreign Policy Committee, calling the European proposal contradictory to international agreements on nuclear technology nonproliferation,¹³² negotiations with Europe continued. On November 14 and 15, 2004, international media indicated that a compromise was reached: Iran agreed to freeze its nuclear program for uranium enrichment; the European countries would agree to the cooperation proposal and guarantees of no sanctions by the UN Security Council. Had Iran not agreed to these conditions, the IAEA Board of Governors most likely would have forwarded the Iranian nuclear program issue to the United Nations for consideration. Ultimately, this could have resulted in sanctions against Iran.¹³³

In May 2005, Iranian government officials announced that the uranium-enrichment moratorium might soon be lifted. Gholam-Reza Aqazadeh, Vice President of the Islamic Republic of Iran and head of the AEOI, said Europeans should understand this action to signal that Tehran will not offer concessions without reciprocal assurances.¹³⁴

This statement could be interpreted in various ways. First, Tehran may be asserting that it has sufficient grounds to doubt the reliability of international deliveries because of pressure from the United States. Therefore, Iran insists on its right to produce its own nuclear fuel, and thus, does not want to forego uranium enrichment. Secondly, nuclear fuel production for a nuclear power plant is economically viable, even when taking Iran's oil, gas, and carbon resources into consideration. Furthermore, in April 2005, during the last round of negotiations between Iran and the European Three, they made no progress talks regarding trade and economic benefits for Iran or its accession to the WTO. Iran remains dissatisfied over its relationship with the French company, Eurodif. Despite Iran's 10 percent stake in the company, Eurodif has supplied no nuclear fuel to Iran.

¹³¹ Petrovskaia, Iu. "Revoliutsiia atoma v Irane." (Atomic Revolution in Iran.) *Nezavisimaia gazeta*. October 21, 2004.

¹³² Groshkov, I. "Tegeran vozobnovliaet uranovuiu programmu." (Tehran Resumes Its Uranium Program.) *Nezavisimaia gazeta*. October 25, 2004.

¹³³ Linzer, Dafna. "Iran Vows to Freeze Nuclear Programs in Return Europeans Guarantee Freedom from U.N. Sanctions." *Washington Post*. November 15, 2004.

¹³⁴ Groshkov, I. "Tegeran vozobnovliaet uranovuiu programmu." (Tehran Resumes Its Uranium Program.) *Nezavisimaia gazeta*. May 12, 2005.

Key nuclear facilities, presently located in Iran, are illustrated on Figure 4.¹³⁵

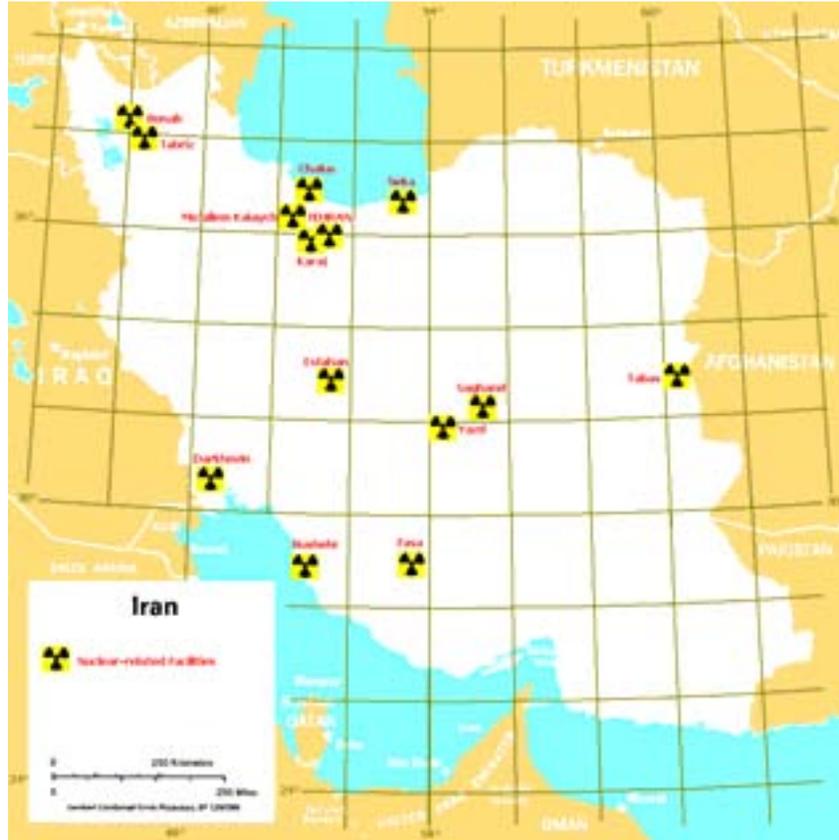


Figure 4: Iran's Nuclear Facilities

Iran's Nuclear Capabilities. No direct proof of an Iranian secret nuclear weapons program exists. In 1995, Russia's Foreign Intelligence Service reported that it found no decisive signs of a coordinated and coherent military nuclear program in Iran.¹³⁶ Compared to North Korea, Iran does not employ nuclear blackmail and invariably emphasizes the civilian purpose of its nuclear program.

Unclassified information and assessment of the existing infrastructure can reveal the real purpose of Iran's nuclear program. Uranium deposits were discovered in 1985. They stretched over an area of 100 to 150 square kilometers in the Yezd Province and contain an estimated five thousand tons of reserves.¹³⁷ Smaller uranium deposits were also found in the Isfahan, Azerbaijan, Khorasan, Sistan, and Baluchistan provinces.¹³⁸ Specialists from Germany, the former Czechoslovakia, China, and Russia were consulted, but mining was never started. In February 2003, Iran announced that deposits in Yezd Province would be exploited for industrial

¹³⁵ Federation of American Scientists materials. <http://www.fas.org>.

¹³⁶ Foreign Intelligence Service open data. <http://svr.gov.ru>.

¹³⁷ Draft Report of the National Security Advisory Board on Iranian Doctrine. August 2001.

¹³⁸ Cordesman, Anthony H. and Arleigh A. Burke, and G. Ryan Faith. *Iran's Search for Weapons of Mass Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects*. Center for Strategic and International Studies. August 7, 2003.

use.¹³⁹

Some experts believe the milliamper calutron located at the Nuclear Research Center for Agriculture and Medicine in Karaj may be one of the potential uranium enrichment facilities in Iran.¹⁴⁰ The calutron was used to separate isotopes for industrial, medical, and agricultural applications. The proximity of the Center to a hydroelectric power plant caused special concern in the West, since the plant can act as a power source for the electromagnetic method of uranium isotope separation.¹⁴¹ However, Iran asserts that the calutron is used exclusively to produce stable elements and IAEA experts confirmed this during the 1992 and 1993 inspections.¹⁴²

Reports on the construction of the first phase of the uranium enrichment facility in Natanz raised suspicions that Iran was able to enrich uranium by using the centrifuge method. Iranian officials confirmed it and IAEA inspectors, headed by the Director General Mohammed El Baradei, were admitted to the plant.¹⁴³ In February 2002, Mr. El Baradei viewed the operational pilot gas-centrifuge fuel enrichment plant, met with Iranian President Mohammad Khatami, and called on Iran's government to join the Additional Protocol to the Safeguards Agreement. The government of Iran agreed to furnish information about any new construction of nuclear facilities.¹⁴⁴

The sources Iran used to build the facility in Natanz are yet to be clearly identified. One hundred and sixty centrifuges have already been installed at the facility, 1,000 more are being assembled, and a 5,000-centrifuge cascade was scheduled for completion in 2005.¹⁴⁵ Some Western experts believe that the cascade will have a capacity large enough to separate sufficient HEU to build two nuclear devices per year, should this political decision be deemed necessary.¹⁴⁶ Existing industrial spaces and buildings under construction will allow over ten thousand centrifuges to be installed.¹⁴⁷ In November 2003, existing enrichment centrifuges were shut down, though new centrifuges were being built, and fuel materials were being prepared for the enrichment process.

An assessment of the future course of nuclear weapons production in Iran can lead to different conclusions. In August 2004, international media reported that the output of the Bushehr nuclear power plant could produce material for up to 30 nuclear warheads annually.¹⁴⁸ According to US

¹³⁹ Timerbaev, R. M. "Blizhnii Vostok i atomnaia problema." (The Near East and Nuclear Problem.) *Iadernyi kontrol'*. No. 3 (Fall 2003). Moscow: PIR-Tsentr, 2003.

¹⁴⁰ Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire.* (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovani, 2003.

¹⁴¹ Cordesman, Anthony H. and Arleigh A. Burke, and G. Ryan Faith. *Iran's Search for Weapons of Mass Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects.* Center for Strategic and International Studies. August 7, 2003.

¹⁴² Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire.* (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovani, 2003.

¹⁴³ IAEA materials. <http://www.iaea.org>.

¹⁴⁴ Ibid.

¹⁴⁵ Cordesman, Anthony H. and Arleigh A. Burke, and G. Ryan Faith. *Iran's Search for Weapons of Mass Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects.* Center for Strategic and International Studies. August 7, 2003.

¹⁴⁶ Timerbaev, R. M. "Blizhnii Vostok i atomnaia problema." (The Near East and Nuclear Problem.) *Iadernyi kontrol'*. No. 3 (Fall 2003). Moscow: PIR-Tsentr, 2003.

¹⁴⁷ Albright, David and Corey Hinderstein. "The Iranian Gas Centrifuge Uranium Enrichment Plant at Natanz." *The Institute for Science and International Security*. March 14, 2003.

¹⁴⁸ Warrick, Joby and Glenn Kessler. "Iran's Nuclear Program Speeds Ahead; 'Startling' Progress at Complex

Undersecretary of State John Bolton, Iran was actively working on producing both HEU and weapons-grade plutonium. He suggested that its government could announce the creation of a powerful system of nuclear weapons as early as 2006. US and Israeli intelligence sources estimate that Iran, considering its present technologies, could build a nuclear bomb in three to five years.¹⁴⁹

European analysts, commenting on Bolton's statement regarding Iran's potential to acquire nuclear weapons within a year, draw a parallel with the US Secretary of State Colin Powell's words on Iraq's nuclear program. According to experts, no reliable facts have been found to support allegations that Tehran is developing nuclear weapons, so Washington should not repeat its "Iraq mistake."¹⁵⁰

Despite many experts from around the world who are certain that Iran can not now nor will be able in the near future to create the scientific and technical conditions necessary to develop and produce nuclear weapons, legitimate concerns linger. Iran is constructing a heavy-water production plant in the central part of the country near Arak¹⁵¹ and is planning to complete construction of a heavy-water research reactor that could be used as a plutonium-separation facility. When considering all these facts, suspicions about the civilian purpose of Iran's nuclear program appear valid.

In summer 2004, the IAEA expressed concern about Iran's reluctance to cooperate with the UN inspectors and adopted a resolution that accused Iran of being unwilling to interact and cooperate with nuclear inspectors.¹⁵² Tehran responded to the IAEA criticism with a statement that the renewal of the uranium enrichment program was under consideration. Tehran urged Berlin, Paris, and London not to permit speculations about Iran's nuclear program since the peace of the entire region was in the balance. Additionally, Iran stated that, despite the negotiated agreement to suspend the program, the country would resume producing enriched uranium and develop new technologies.¹⁵³

Nevertheless, it is unlikely that Iran has secretly produced weapons-grade nuclear materials, since it signed the Additional Protocol and the IAEA conducts inspections of the Natanz facility. If Iran refused to admit IAEA inspectors to its facilities and withdrew from the NPT, Iran would be able to implement a nuclear-weapons development program by using all key components of the nuclear-fuel cycle.

Missile Technologies of Iran. Tehran's missile program serves as convincing, indirect proof of the Iranian government's intentions to produce nuclear weapons.

Undoubtedly, the original goal of Iran's missile program, which jelled in 1984 and 1985 after Iraqi missiles hit Iranian targets, was to create a missile deterrence capable of repelling Iraq's threats.

After Iraq's crushing defeat in Operation Desert Storm, the goals of Iran's missile program changed. According to Iran's government, it seeks to have the Persian Gulf region within range

Poses Challenge to Bush Administration at Delicate Time." *Washington Post*. March 10, 2003.

¹⁴⁹ Andreenko, Anton. "Iran i uran." (Iran and Uranium). *7 dnei*. August 26, 2004.

¹⁵⁰ Shumilin, Aleksandr. "V mire letiat 'iadernye utki'." (Nuclear Hoax in the World.) *Izvestiia*, October 19, 2004.

¹⁵¹ US intelligence reports based on satellite imagery. Bellona Foundation. February 24, 2003.

¹⁵² IAEA materials. <http://www.iaea.org>.

¹⁵³ Andreenko, Anton. "Iran i uran." (Iran and Uranium). *7 dnei*. August 26, 2004.

of its missile forces.¹⁵⁴ This could mean probable targets might include Israel and Saudi Arabia. Iran's key missile facilities are illustrated on Figure 5.¹⁵⁵

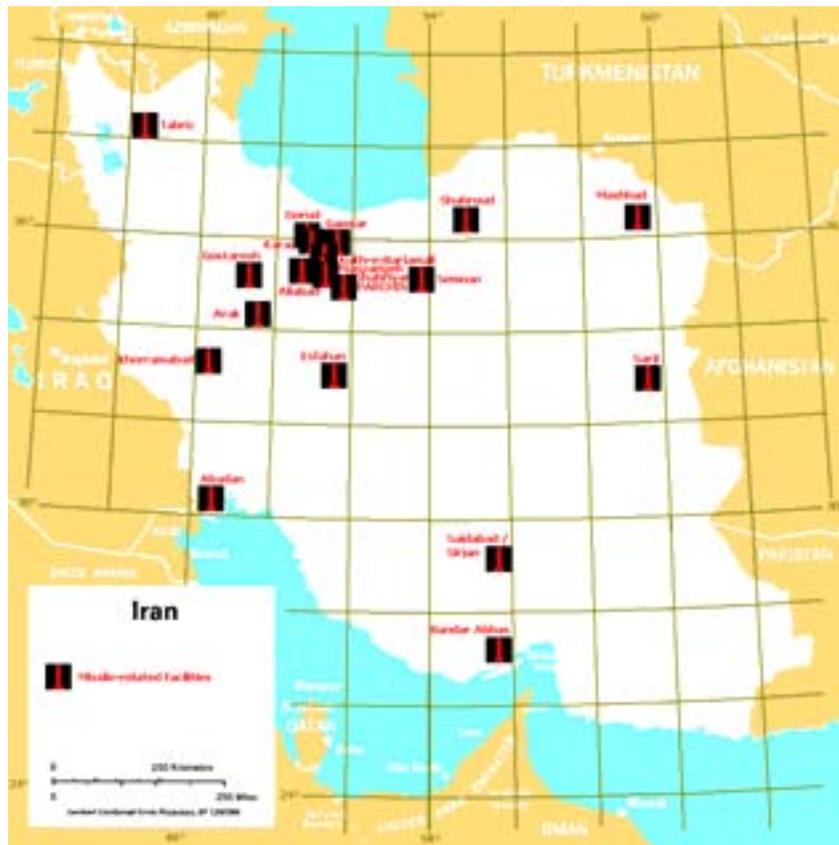


Figure 5: Iran's Missile Facilities

Iran has achieved some success in reaching missile armament self-sufficiency. The country produces solid-propellant and liquid-propellant missile systems, some of which are guided. Although, problems with missile guidance and control systems do not allow for high accuracy now, Iranian specialists are constantly perfecting the systems. Thus, in the near future Iran will probably be able to strike single targets with a high degree of accuracy.

Iran is now producing non-guided tactical solid-propellant missiles, (the Ohab missiles with a 45-kilometer range) and Nazeat-10 missiles with a 150-kilometer range.¹⁵⁶ Iran is probably developing reliable guidance systems for existing solid-propellant missiles and development models. Some experts also believe that in addition to working on guidance systems, Iran has a program for developing solid-propellant ballistic missiles with a range of over 1000 kilometers.¹⁵⁷ Iran's government emphasizes the development and production of liquid-

¹⁵⁴ Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire.* (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovani, 2003.

¹⁵⁵ Federation of American Scientists materials. <http://www.fas.org>.

¹⁵⁶ Desutter, Paula A. *Denial and Jeopardy: Deterring Iranian use of NBC weapons.* Washington, D.C.: National Defense University Press, 1997.

¹⁵⁷ Cordesman, Anthony H. and Arleigh A. Burke, and G. Ryan Faith. *Iran's Search for Weapons of Mass*

propellant SRBMs and MRBMs, which are considered the main delivery systems for WMD.¹⁵⁸

By the mid-1990s, reports surfaced that Iran was undertaking a new program to develop missiles with a 2000-kilometer range.¹⁵⁹ On July 24, 1998, Iran announced it had successfully tested the 1200-kilometer range Shahab-3 missile.¹⁶⁰

In the opinions of numerous foreign experts, Iran has most likely cooperated with North Korea and Pakistan on missile technologies.

Iran is actively pursuing its goal to develop its missile program and to become self-sufficient in the development and production of short- and medium-range missiles. The missiles included in its arsenals and those still being developed can be used to deliver conventional weapons, nuclear weapons, and other types of WMD. In any case, Iran's missiles can be a powerful tool when used as political leverage to influence regional events.

Conclusions

This analysis of the North Korean and Iranian nuclear programs and their roles in creating instability in the international community leads to a number of conclusions:

1. Considering the tense situation in Northeast Asia and the Middle East, the unwillingness of North Korea's and Iran's leaders to give up their nuclear status is quite predictable. All five nuclear-status nations and many other developed countries played either an active or a passive role in supporting the two countries in their programs.¹⁶¹
2. The unpredictable nature of countries with authoritarian regimes, such as the DPRK, constitutes one of the main problems for missile and nuclear nonproliferation. These countries, when accused of making or acquiring WMD, are impenetrable to outside influences that could identify their intentions, much less their actual military and nuclear state of affairs.
3. Pyongyang adopted a tough nuclear position against a problem-riddled backdrop and fear of possible US preventive measures. North Korea announced that it could produce nuclear weapons to guarantee its security: it will adhere to that policy until it achieves real military and economic security by joining the global community. However, the Bush administration's tough line did not cause the current situation on the Korean peninsula; President Bush's policy only accelerated a process initiated long before he came to power.

Destruction, Warfighting Capabilities, Delivery Options, and Weapons Effects. Center for Strategic and International Studies. August 7, 2003.

¹⁵⁸ Ibid.

¹⁵⁹ Novikov, V. E. *Sostoianie i perspektivy razvitiia iadernykh i raketnykh tekhnologii v Irane. Iran v sovremennom mire.* (Existing and Prospective Nuclear and Missile Technologies in Iran. Iran in the Modern World.) Edited by E. M. Kozhokin. Moscow: Rossiiskii institute strategicheskikh issledovani, 2003.

¹⁶⁰ Draft Report of the National Security Advisory Board on Iranian Doctrine. August 2001.

¹⁶¹ Romashkina, N. P. "Nepriзнанные iadernye derzhavy." (Non-recognized Nuclear Nations.) In *Vooruzhenie i bezopasnost: Mezhdunarodnaia bezopasnost': novye ugrozy novogo tysiacheletia.* (Arms Control and Security. International Security: New Threats Posed by the New Millennium.) IMEMO Annual (2001-2002). Moscow: Nauka, 2003.

4. Data analysis indicates that North Korea possesses enough nuclear material to make one to six nuclear weapons. Currently, whether North Korea has produced WMD is unsubstantiated. Even if North Korea does not possess nuclear weapons today, there are numerous reasons why the DPRK could in the future. Two feasible theories stand out: First, the DPRK could continue working with the plutonium it prepared for producing nuclear weapons, requiring approximately six months to build an explosive device. Second, within the course of the next two years, North Korea's facility in Yongbyon could produce additional nuclear material required to produce nuclear weapons.

For some time, North Korea possessed enough plutonium to produce one or two nuclear weapons. However, because of the technical sophistication of implosive-type plutonium devices, it is unlikely that any such nuclear weapons were produced. Recent speculation focuses on DPRK's capacity to produce less technologically complex gun-type, uranium-based, nuclear devices.

5. Until recently, the six-party talks, which include countries concerned about the future of North Korea, hoped to influence the DPRK and resolve the nuclear problem on the Korean peninsula. In principle, the talks were viewed as a new way to ensure security in Northeast Asia and to strengthen strategic stability. Many experts consider North Korea's participation in the talks a priority for international diplomacy.

However, the negotiation process has not been effective and Pyongyang is dissatisfied with the current direction of the talks. Though some tactical problems are being solved, the talks have not achieved the main goal, namely a full security guarantee from the US and significant aid. The negotiation process itself provides security to North Korea. In return for its participation in the talks, the DPRK receives economic aid from China and South Korea, as well as international organizations. Since the process of negotiation benefits North Korea, Pyongyang is unlikely to exert significant effort to reach a compromise. By doggedly pursuing its original goals, North Korea tries to benefit from US progress toward the compromise. This policy of nuclear ransom can yield only temporary results. In the future, Pyongyang could apply diplomatic bluffing and blackmailing without a guarantee of success.¹⁶²

A serious and complex problem confronts the global community: how to determine whether North Korea possesses nuclear weapons. North Korea's extreme interest in economic aid could be used to solve this problem.

6. Despite the IAEA inspections in 1992, 1993, 1995, 1997, and 2000, there is no reliable data on whether Iran possesses nuclear weapons and what the main components might be. However, indirect proof suggests that Iran is expanding the nuclear and missile programs that it initiated in the 1980s.

Iran views Israel's undeclared nuclear potential as the prime factor of instability in the Middle East. This spurs many other countries in the region to obtain scientific and technical knowledge to produce their own nuclear armaments and delivery systems.

Iran, although dedicated to creating an infrastructure for a closed nuclear fuel cycle, leaves its decision to produce nuclear weapons in the foreseeable future unclear.

¹⁶² Mikheev, V. "Severokoreiskaia iadernaia programma." (North Korean Nuclear Program.) Northeastern Asia: Nuclear Proliferation Problems. Conference Materials. October 28, 2004.

Iran is trying to create an infrastructure to produce MRBMs. Its goal is to create the most powerful missile potential in the region by 2015.

7. Both Russia and the United States deem unacceptable Iran's production or acquisition of nuclear weapons. Opinions diverge on the comprehensive control of Iran's nuclear fuel cycle and its supplies.
8. Given North Korean economic difficulties, it could be tempted to act for financial gain. Should either North Korea or Iran acquire nuclear capability, the possibility that the weapons could spread to other countries or terrorist groups increases.

Iran, in an unstable region, raised the possibility that nuclear weapons, materials, technologies, and production knowledge could be sold or otherwise passed to terrorists. The threat could affect the entire world.

Nuclear terrorism needs to be thoroughly studied. The global community must create international laws, regulations, and systems of effective practical measures to prevent threats. All countries must pursue a clear approach to nuclear terrorism and reach a mutual understanding on how to cooperate and prevent terrorism in general. The approach should condemn all forms of terrorism and fight against unacceptable methods of achieving goals, no matter what ideology stands behind the goals.

9. Both WMD and missile-technology proliferation are growing threats, but no mechanisms address the nuclear problems in North Korea and Iran. As a result, neighboring countries, including China, India, Pakistan, Israel, Taiwan, South Korea, and Japan, inevitably build or expand their arsenals. This could undermine the pro-US regimes in Islamic states, particularly Saudi Arabia, Pakistan, Egypt, and Turkey.
10. Approximately 20 countries joined the US-led Proliferation Security Initiative (PSI) aimed at stopping shipments of weapons and related materials. Since countries continue to join, this new cooperation among nations could play an important role in the future nonproliferation regime.
11. In the context of increasing general strategic ambiguity in international relations, the international community's primary nuclear nonproliferation objective is to find diplomatic and economic methods that can stabilize regional conflicts.
12. In view of the current situation, the United States, Russia, China, and the European Community will need to assess whether their individual and/or joint deterrence forces are necessary or sufficient. Nuclear multipolarity will exacerbate the problem of keeping a stable strategic balance.

An analysis of the different approaches, particularly those employed by Russia and the United States, to solving this problem provides interesting insights. The security of the Russian Federation may suffer more than that of the US for the following reasons. First, the forces of third nuclear countries are closer to Russia and could more easily be directed against it. Secondly, the United States has already begun developing its strategic NMD—in 2004 the system's first ten components were installed in Alaska.¹⁶³ The system is designed to defend the United States against an attack from emerging nuclear nations. For Russia, in contrast,

¹⁶³ Glanz, James. "This Time It's Real: an Antimissile System Takes Shape." *New York Times*. May 4, 2004. <http://nytimes.com>.

modernization and expansion of its anti-missile defense system has been very limited. Thirdly, issues such as negative control, emergency launch, weapon theft, and other contingencies, raise grave concerns and uncertainty about third countries' nuclear weapons.¹⁶⁴ Thus, Russia has a vested interest in strengthening stability through disarmament, as well as nonproliferation of WMDs and delivery-vehicles. Russia's role is significant and should be leveraged to its full extent.

Experts from many countries, including Russia, hold differing opinions on this subject. According to some experts, Russia underestimates the long-term threat of nuclear and missile proliferation because of other pressing issues. Not all members of Russia's political and military elite consider North Korea's nuclear programs dangerous.¹⁶⁵ Recently, Russia has taken steps in the right direction and is still an important player; however, Russia is still shaping national strategy for the problem. In the context of missile and nuclear multipolarity, Russia's priority is to involve new, real, and potential members of the nuclear club in the nonproliferation system, thus increasing the likelihood of greater international participation.

Following the break-up of the Soviet Union, the United States became the only superpower and the White House's political approach has clearly shifted.

In Iraq, the United States employed its strategy of preventive strikes against any country suspected of possessing WMD and posing a threat to the security of the United States or its allies. No WMD were found. In North Korea, the United States did not follow the tough, uncompromising policy it had implemented in Iraq. Instead, current international conditions encouraged dialogue among the nations. Russia, China, Japan, and South Korea were also instrumental in mediating the North Korean nuclear problem.

The situation in Iran appears more serious. Iran is an active participant in political and economic processes throughout neighboring regions. It partners with China, Russia, and major European countries. To be effective, the United States, which heads the currently monopolar international system, will need to develop more complex political mechanisms for its relations with Iran.

13. In the 21st century, the United States and Russia face new threats. Washington and Moscow should establish a joint coalition to counteract these new challenges. The two countries should be persistent in their search for rapprochement in policy. A strategic partnership between Russia and the United States could prevent further destabilization of international relations.

¹⁶⁴ Arbatov, A. "Yadernoe sderzhivanie: real'nosti i khimery." (Nuclear Deterrence: Realities and Myths.) *Nezavisimaya gazeta*. May 14, 2004.

¹⁶⁵ Kokoshkin, A. A. *Iadernye konflikty v 21 veke (tipy, formy, vozmozhnye uchastniki*. (Nuclear Conflicts in the 21st Century: Types, Forms, Possible Players.) Moscow: Media-Press, 2003.

Epilogue

Since the end of the current research, tendencies, remarked upon in this work, were further developed.

On July 4 & 5 2006, DPRK conducted a number of missile tests. According to various sources of information, six to eight missiles were launched. Long range, three-stage, liquid-fuel ICBM (range approximately 6700 km) Taepo-dong-2 capable of reaching Alaska and Hawaii and capable of carrying a nuclear warhead. [During testing] at the 40th second of flight [the Taepo-dong-2] exploded and fell into the Japanese sea due to technical problems. Other missiles also fell into the Japanese sea. In response, South Korea stopped provision shipments to North Korea. On the 15th of July the UN Security Council unanimously decided to toughen the sanctions against DPRK: the UN member countries banned any missile materials and technologies coming from or going to, North Korea.

In early September 2006, Pyongyang's intentions to test its nuclear weapon became known. At the end of September DPRK representative to the UN announced that Pyongyang was ready to resume negotiations. But American sanctions made it impossible. On the 3rd of October, the DPRK formally announced its willingness "to realize an inevitable nuclear explosion to defend against oncoming American aggression." The underground nuclear explosion occurred at 10:36 (local time), October 9. The tests were confirmed by Chinese and South Korean specialists. According to South Korean intelligence data, the tests took place in Hwaderi near Kilju city in the Hamkyung-Puhkto province on the north-east of the country (relatively close to the border between the DPRK and the Russian Federation). A powerful explosion was detected in that area according to the South Korean military representative. According to the South Korean seismic monitoring center data, the power of the earthquake shocks was about 3.6 points of the Richter scale. The North Korean party declared that the first nuclear tests were successful and there is no radioactive leakage or corresponding threat. 'Nuclear tests were conducted with the greatest wisdom and fulfilling all technological rules', North Korea's Central Telegraph Agency informed [the world]. All countries of the world, except Iran, condemned these tests. International experts believe that the tests were not quite successful and a non-transportable, low capacity, nuclear device of was probably exploded. A few days later, Pyongyang declared that if the USA increases pressure, it would be regarded as a declaration of war. 'Physical means of reaction' will follow the new sanctions imposed and willingly accepted by many countries. The first consequences of the nuclear tests were that the moods of the Japanese and South Korean society changed. Both countries froze trade and assistance programs to the DPRK.

A breakthrough happened after the regular rounds of six-sided negotiations between the USA, China, Russia, Japan, and the two Koreas devoted itself to the nuclear program of the DPRK. Its purpose is not in the final removal of the North Korean nuclear weapon issue – a considerable amount of time will pass until this aim is achieved. However all members of the "Group of Six", including DPRK first of all, agreed, that exactly this aim should be achieved at the end of the negotiation process, and, secondly, a common opinion on phased solution of this issue was reached. In July 2007 DPRK shut down, and put under the control of the IAEA, its main plutonium production facility – the Bonbon reactor. And in the beginning of September, Pyongyang presented all information on its nuclear programs, including uranium enrichment programs agreeing to close them up by the end of 2007. At the same time the liberation from the economic restrictions and sanctions imposed by the USA and UN after the North Korean nuclear

test in October 2006 gradually took place. Agreement was also reached on opening direct negotiations between the DPRK and the U.S. which still do not have diplomatic relations.

Regarding Iran during this period the information that the IRI got its centrifuges from Pakistan, not Russia, and that the Bushehr reactor did not play any significant role in that effort, was confirmed. Thus, the problem concerning the Bushehr nuclear reactor, which was the most contentious issues between the USA and Russia for more than a decade, became less sharp. This affected changes in Russian policy in the region. Apparently, in current context it can't be said that Russia will reconsider the issues of the nuclear collaboration with Iran and about the radical turn in the Russian policy. However, during the last year, the situation with Russian-Iranian relations was complicated due to the delay the fuel delivery, missed payments, Bushehr nuclear reactor commission terms transfer, and sanctions against Iran.

The information that Iran is willing to import weapons-grade Uranium-238 from Africa appeared (a large lot of nuclear materials was intercepted by the Tanzanian customs)¹⁶⁶ in the press in 2006, as yet another example of contraband nuclear materials and technologies.

In May 2007, talks were held in Iraq concerning the solution to the Iranian nuclear crisis, which were interesting not because of their content, but because of the fact that for the first time in 27 years, representatives of the United States and Iran met each other at the negotiation table¹⁶⁷. This historical meeting was held in the most protected place in Baghdad – in Prime Minister Al-Maliki's residence. The USA and Iran were represented by their ambassadors to Iraq. As a result, the ambassadors of the USA and IRI established a similarity of opinions on a number of questions. And the member of the Iranian government, who took part on the meeting, declared, that it had passed in a cordial atmosphere. However, Iraqi militants reacted to the negotiations in their own way: during the meeting in Baghdad an explosion took place resulting in the death of 26 and the wounding of 68 people.

This current fact and other facts point to the emergence of some positive tendencies in Iran's policy at the present time: Teheran is willing to solve all arguable issues concerning its nuclear program through negotiations and to regulate the issue within the bounds of the IAEA.

Moreover, events in other countries in the region, indirectly important for the North Korean and Iranian nuclear problems, developed. Confrontation between the Sunni and Shiite communities in Iraq has reached the true civil war level; American casualties rose and the majority of the American population are against the war in Iraq. Mutual hostilities between FATAH and HAMAS in Palestine turned into an armed conflict and only through the mediation of the Saudi king was an agreement to create the National Unity Government reached. However, the prospects of a renewal of the Palestinian-Israeli negotiations look unfavorable.

At the global level, nuclear weapons are, as before, restricted yet some countries, not to mention terrorist groups are trying to get them. After the nuclear tests conducted by the DPRK, Japan declared that its military potential should be strengthened and its attitude towards the nuclear weapons creation program should be changed. Public opinion polls in South Korea at the end of 2006 showed that South Koreans consider it necessary that their country create nuclear weapons. Therefore, according to the worst forecasts, the planet stands in peril of a nuclear catastrophe, as

¹⁶⁶ Ivan Gorshkov, Iran will not leave the NPT. Independent newspaper, 08.08.2006: http://www.ng.ru/world/2006-08-08/7_iran.html.

¹⁶⁷ The USA and IRI don't have formal contacts since 1980 after the relations break.

another 35-40 countries (such as Turkey, Saudi Arabia, Egypt, Nigeria and number of others) are able to create atomic bombs in the foreseeable future, and most probably, it will be the countries in Asia first. As long as five out of eight (three of them – officially acknowledged) of the world's nuclear countries are situated in Asia – Russia, China, Israel, India and Pakistan, and essentially, in the last decade, destabilize the international relations system in threshold countries like North Korea and Iran, the world community continues to express alarm regarding this continent.

Can this scenario be prevented? Can the future nuclear proliferation in general and in Asia, particularly, eventually, be controlled? Can the proliferation process be controlled today?

What we can now observe in Asia is a result of tendencies that were emerging long before the so-called Nuclear Crisis in both countries. During the last years much can be said about the world community's silent consent regarding the presence of nuclear weapons in Israel, India and Pakistan. Moreover, as was pointed out in the Conclusion of this paper, the DPRK and Iran's desire to gain nuclear weapons could have been predicted. In fact, the five nuclear powers and other developed countries played a supporting role in the nuclear development of the Asian countries. Today the new possessors of the nuclear weapons play a similar role.

Demand for nuclear weapons has created the corresponding market. This demand was and will be determined by apprehension and desired aims in the sphere of security [concerns], as well as by historical and cultural antagonisms. Till the end of 20th century, the proposals [desires], corresponding to the demand, were dictated by the political aims and ambitions, and called for serious financial expenditure from those, who directly or indirectly helped to create the nuclear and missile weapons. On the modern stage, nuclear [proliferation?] is becoming more and more connected to the material profit from the sale of corresponding ideas, armaments and technologies—just as in other vital spheres—quite logically correspond more and more to the market economy and globalization and so, was therefore predictable.

And it means that in spite of growing instability, nuclear proliferation remains clearly defined and controlled problem. Different international methods and key factors, allowing the prevention or delay of the further widening of the nuclear club, existed. In the past, similar efforts weakened the interest to create nuclear weapons in South Africa, Argentina, Brazil, Libya, Syria and others. In general, the number of countries refusing to produce nuclear weapons since 1960 is more than amount of countries, who become nuclear since that time. Consequently, traditional non-proliferation means can be quite effective today too. Moreover, taking into consideration the new tendencies, the list of non-proliferation abilities can be widened. Besides, the deep understanding of the reasons that define the willingness of one country or another to possess nuclear weapons, in every current case, is a very important in reducing the demand for it. The current nuclear situation in the North Korea is the best acknowledgment this.

Consequently, new off-centre approaches and solutions, including new scientific ones—in addition the ones used earlier—are necessary in addressing the nuclear proliferation issues. These approaches should be based on the use of the most modern interdisciplinary research. At the present time only developed countries could manage to do this. Such research concerning the Iran nuclear weapons development study could have been ordered only by the US National Intelligence Council (NIC) in the autumn of 2006, which was then reported in February 2007 in the American The New York Sun¹⁶⁸ issue. The nuclear Iran consequences study will be the first

¹⁶⁸ Ali Like. Spies studying “inadmissible prospective”, InoPressa webpage: <http://www.inopressa.ru/print/nysun/2007/02/09/12:51:42/iran>.

NIC analysis of the Bush policy towards the possibility of Iran's (including financial sanctions, military maneuvering and diplomatic compulsion) failure. Apparently, this research will affect the future National Intelligence Council's nuclear program evaluation of Iran, in which, as it is expected, the Iranian nuclear weapon emergence timeline (which is about 5-10 years) will be analyzed one more time. It is evident that such research, scientific and political analysis of the results in other countries taking into account their aims would allow discussion—on equal terms—on the international level in order to reach a compromise solving such global problems as nuclear proliferation.

Thus, proliferation in general and nuclear proliferation in Asia in particular, is neither uncontrolled, nor an inevitable process. The means, needed to decrease nuclear weapons demand, still exist and are still effective assuming that all interested countries will, in a constructive and timely manner, and when the opportunity arises, use new approaches to maintain international security.

As regards the problem generated by the nuclear armament of the DPRK, the modern situation undoubtedly can be considered a success after the four-year negotiation difficulties, which seemed to be insurmountable. And this situation must be understood in the broader dimension without depending on the roller-coaster developments of the future.

Analyzing the most differing opinions, I have come to the conclusion, that, unlike previous years, the majority of experts do not discuss [the fact] that security and stability in the modern world can be achieved only taking into account the shaping, multi-polar world system. During the Cold War era the main threat to the security originated from the possibility of a global thermonuclear war. This prospective could have been prevented only by the efforts of the two superpowers. After the Cold War other challenges and perils emerged – nuclear weapons proliferation, international terrorism, and bloody, regional, conflicts. Their curtailment must be conducted not only by the unilateral efforts of the USA, but by multilateral actions based on the impartial process of a multi-polar world order. The agreement, achieved on the negotiations of the 'Group of Six', is a brilliant illustration for such a conclusion. Success was guaranteed only due to the joint efforts of participants during the six-sided negotiations. It is precisely the elaboration of their common position which created a condition of realism of which the DPRK party became aware.

One more important point: success began to show after the US moved from its original position to the point of addressing an ultimatum—the threat of force—to North Korea. Washington didn't hide its willingness to overthrow the regime in Pyongyang. Initially, the U.S. refused to hold bilateral negotiations with the DPRK and agreed to approach the issue in a multinational format since the U.S. hoped it would be able to win the support of other countries participating in the negotiation process. This didn't happen because of the quite clear reason – and Russia, and China, and Japan, and South Korea are unambiguously set against military actions, regime overthrow and its after-effects in DPRK, similar to Iraq, because all of them (Japan, China, Russia, South Korea) are afraid of the squall of the North Korean refugees. The latest rounds of negotiations showed that in the end, the U.S. faced up to reality and started moving away from its "unipolar" line.

Undoubtedly the lessons that can be drawn from the North Korean nuclear problem are important to solving Iran's nuclear problem. But some conclusions can be made even today.

First, the chance to successfully resist the proliferation of nuclear weapons can be accomplished

not by the application of force, but [also] through negotiations.

Second, just on the base of negotiations, a search for joint solutions—and not by rallying to use force—multilateral collaboration against nuclear proliferation should be conducted.

Third: taking into account the absence of mutual trust between those, who wish to realize nuclear programs, and those, who are not willing to allow the proliferation of nuclear weapons; it is necessary to act in a coordinated, step-by-step manner to bring both parties together.

Lastly, based on the experience of the negotiations with the DPRK, it is possible, [even] logical, to speak about a multilateral negotiating process with Iran and about creation for this purpose, groups or structures, in, for example, the USA, Russia, China, India and the European Union [to carry out these negotiations].

This would in no way detract from American-Iranian negotiations on wider issues—to include the Middle East—or concerns.

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