



**RECEIVED
MAY 05 1997
OSTI**

**C. Austin Reams
December 1996**

MASTER



**Center for International Security Affairs
Los Alamos National Laboratory**

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

KT

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the University of California for the US Department of Energy under contract W-7405-ENG-36.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Russia's Atomic Tsar:

Viktor N. Mikhailov

C. Austin Reams
Graduate Research Associate
Center for International Security Affairs
Los Alamos National Laboratory

December 1996

LA-UR-97-234

THE LOS ALAMOS NATIONAL LABORATORY STRONGLY SUPPORTS
ACADEMIC FREEDOM AND A RESEARCHER'S RIGHT TO PUBLISH;
THEREFORE, THE LABORATORY AS AN INSTITUTION DOES NOT ENDORSE
THE VIEWPOINT OF A PUBLICATION OR GUARANTEE ITS TECHNICAL
CORRECTNESS.

Russia's Atomic Tsar:

Viktor N. Mikhailov

C. Austin Reams
Graduate Research Associate
Center for International Security Affairs
Los Alamos National Laboratory

Contents

I. Executive Summary

II. "I Am a Hawk"

III. Political Positioning

A. Ministry of Defense

B. Gosatomnadzor

C. Finances

IV. Threat Reduction Relations

A. Joint Verification Experiment

B. Purchase of Highly Enriched Uranium

C. Mayak

D. Materials Protection, Control & Accountability

V. The Iranian Reactor Deal

VI. Conclusions

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

Executive Summary

A threat of a different kind of nuclear danger evolved in the twilight of the Cold War, as did US efforts to address it. When the Soviet Union collapsed in August 1991, social, political, and economic difficulties set in stirring western concerns that the Soviet-made nuclear arsenal, including that apparatus and industry that created it, was not secure. Many feared that the former Soviet Union's nuclear weapons were in danger of being lost or stolen as a result of political, economic, and social instability in the region. The structures that controlled, protected, and accounted for stored nuclear material, technology, and expertise suffered from lack of social and political oversight as well as funding. These difficulties increased the threat of nuclear danger from the former Soviet Union (FSU) despite its official support for arms control, disarmament, and nonproliferation agreements. In the wake of this realization, the US strategy to defend against the Russian nuclear threat shifted from a largely military effort to a diplomatic and cooperative one. So-called Nunn-Lugar legislation subsequently emerged, creating the Cooperative Threat Reduction (CTR) program designed to reduce the threat of this new nuclear danger from the FSU. The program was designed to assist Russia in the transfer of former Soviet nuclear weapons from FSU states, help protect and store them, and eventually observe nuclear arms control agreements. As the FSU disarmed, it soon became clear that deployed nuclear weapons were not the only nuclear danger to US national security from the Russian nuclear complex. Even after disassembly, the components of Russian nuclear weapons remained, presenting a more complex proliferation risk. Various other threat reduction¹ efforts developed, offering assistance to Russia and other members of the Commonwealth of Independent States (CIS) to safeguard dismantled nuclear materials and technology, pay and employ weapons scientists, and assist in the creation of nuclear materials control and accountability regimes. Cooperation with Russian ministries and other political entities is mandatory for the successful implementation and realization of threat reduction programs and agreements to reinforce Russia's commitment to arms control, disarmament, and nuclear nonproliferation. Many ministries play key roles; however, the cooperation of one in particular is requisite for the success of several of these programs--the Ministry of Atomic Energy (Minatom).

Minatom was created to manage Russia's nuclear weapons program in the age of disarmament. Its predecessors were responsible for constructing Russia's nuclear complex for defense; presently Minatom is largely responsible for overseeing its conversion, as well as managing a smaller and aging nuclear weapons program. The ministry is responsible for the development, production, and maintenance of nuclear weapons, warhead dismantlement, the production of nuclear materials for weapons, the

¹For the purposes of this paper, "threat reduction" refers to any effort intended to reduce the scope and effects of nuclear danger, including programs and agreements dealing with arms control, disarmament, and/or nonproliferation directly or indirectly.

disposition of nuclear materials disassembled from warheads, the administration of Russia's vast nuclear weapons complex, the development of policy for the future role of Russia's nuclear complex and payment of employees entrusted with such tasks². Thus, Minatom is instrumental in the implementation of arms control, disarmament and nonproliferation agreements.

The director of Minatom, Viktor N. Mikhailov, wields a great deal of power and influence over Russia's nuclear infrastructure. He is an important player amidst efforts to reduce the threats posed by Russia's decaying nuclear complex. There are certainly other personalities in the Russian government who influence Minatom; however, few affect the ministry as profoundly as Mikhailov. His ability to influence Russia's nuclear complex has been clearly demonstrated by his policies in relation to the US purchase of Russian highly enriched uranium (HEU), the planned fissile material storage facility at Mayak, materials protection, control and accountability (MPC&A) programs, and his unwavering determination to sell Iran commercial nuclear technology. Mikhailov has also been a key negotiator when dealing with the US on issues of transparency of weapons dismantlement and fissile material disposition, as well as the use of US threat reduction funds. His policies and concerns in these areas will affect the prospects for the successful negotiation and implementation of future nuclear threat reduction programs and agreements with Russia. For these reasons, Mikhailov's views must be taken into account by politicians, diplomats, and scientists working with the Russian government and Minatom on programs to reduce the nuclear threat in its many forms.

While Mikhailov's strong influence over Minatom is apparent, his powers within the Russian government are not without limits. Minatom must act in concert with other Russian ministries to achieve its goals; it cannot afford to be politically isolated without the support of such powerful figures as the president and those he appoints. Russia's uncertain political environment may pose new challenges to Mikhailov's power over Minatom and his ability to influence Russian foreign and domestic policy.

Mikhailov's policies are likely to be influenced by his background and experiences. It is challenging to piece together a portrait of Mikhailov from sources openly available. There is little about the many years he spent living and working amidst the most secret world of the Soviet nuclear weapons complex. Although Mikhailov recently published an autobiography--**I Am A Hawk**--documenting his life as a nuclear weapons theoretician, designer and tester, it is virtually impossible to verify this account. Information about Mikhailov is more plentiful after 1987, when he emerged from secrecy and isolation.

² Moscow *Vooruzheniye, Politika, Konversiya* in Russian, No. 3 (10), 1995 (Signed to press 18 December 1995), p. 12-17; FBIS-UMA-96-119-S, "Fifty Years of Ministry of Atomic Energy Work Are Aimed at Ensuring the Country's National Security," 19 June 1996, (World News Connection).

I Am a Hawk³

“The hawk is a bird known for its swift flight and graceful landings, its keen hearing and vision, its powerful beak, and its paternal concern for its progeny.”⁴

Mikhailov compares himself to a hawk in his autobiography; however, the comparison is supposedly not correlated with the western, pro-military political metaphor. Mikhailov's book presents a distinct patriotic attachment to his Russian motherland, reminiscent of Russian Bogatiers (heroic Russian horsemen of art and literature), orthodox values, and pre-October revolution nostalgia rather than that of the selfless proletariat, party-line loyalty, and Soviet world revolution. From his book and other scattered sources, it is possible to piece together a personal history of a man who has spent most of his adult life in the clandestine world of the Soviet nuclear weapons industry.

Viktor Nikitovich Mikhailov was born February 12, 1934, in Sopronovo, Moscow Oblast. He describes his boyhood as normal and playful, but short. World War II broke out before his eighth birthday, wiping away his youthful naiveté by exposing him to the harsh realities of the time. “The death of loved ones, hunger, and cold--that is what the war gave my family,” notes Mikhailov.⁵ In 1941 his family was forced to leave their home town as a result of the war, only to return a year later to the desolate scene of a destroyed village. Both his father and older sister died during the war. He and his mother moved to the northern city of Nickel across the Barents Sea in 1945, where he gained an interest in nuclear physics and eventually graduated from secondary school.

In 1952 Mikhailov's scientific career began to take shape. He was admitted to the Moscow Engineering Physics Institute where he met his wife, in addition to Yakov Borisovich Zeldovich (a central figure in the genesis of Russia's nuclear weapons program), his first real contact with the secret Soviet nuclear effort. Zeldovich advised him on his thesis, “Theoretical Nuclear Physics.”⁶ He graduated with distinction from the Moscow Institute and was invited by Zeldovich to “test for a job” at the “installation”--Arzamas-16.

Mikhailov apparently passed the “test” as he and his wife moved to Arzamas-16 in 1957. At the secret Soviet installation, he worked at the All-Union (now All-Russian) Scientific Research Institute of Experimental Physics, focusing his efforts on the theory of pulse fission reactors and nuclear explosion processes. He also worked with the two theoretical

³Title of Mikhailov's autobiography, “I Am a Hawk (Ya--Yastreb).” (*Ya-Yastreb* in Russian, 1993, signed to press 1 November 1993, p. 5-127; JPRS-TAC-94-010-L, “I Am a Hawk--Memoirs of Atomic Minister Mikhailov,” Mikhailov, Viktor N., 24 August 1994, (World News Connection).

⁴ Viktor Mikhailov, *Ibid.*

⁵*Ibid.*

⁶*Ibid.*

divisions at Arzamas-16, one headed by Zeldovich the other by Andrey Dmitriyevich Sakharov. The direction of his career was greatly influenced when he gained "experience in [weapons] production" at Arzamas-16. Soviet weapons theorists were required to be present at the testing of their "products".⁷ As he notes: "Each of us . . . had to accompany his product to the nuclear test site."⁸ Thus, Mikhailov's career led him to the world of nuclear testing.

Two years after his arrival at Arzamas-16, Mikhailov traveled to the nuclear test site at Semipalatinsk, Kazakstan, to witness an atmospheric nuclear explosion for the first time. Mikhailov speaks proudly of his atmospheric testing experience, and yet says he regrets the effects of such testing: "[I]t would have been better if these tests had never been conducted at all!"⁹ After the 1963 treaty banning atmospheric tests, some of the Soviet underground nuclear testing was undertaken at the northern island of Novaya Zemlya, where Mikhailov participated in many tests from 1966 to 1969. During that time he received the Lenin Prize. He writes wistfully of the time he spent at the northern test site, while acknowledging that the area has been contaminated by at least one test accident. In 1969 he moved to Moscow where he worked at the Moscow Research Institute of Impulse Technology, an R&D facility responsible for the development of diagnostic equipment used during nuclear tests.

In 1987 Mikhailov emerged from a life of obscurity when he traveled abroad for the first time in his life at the age of 53, to the German Democratic Republic (GDR). Until that time, he had lived under the iron-clad shroud of secrecy that blanketed the Soviet nuclear weapons program. He had mostly known the fear of war, life amidst Russia's secret cities behind barbed-wire fences, and existence in the geographic obscurity of the Kazakstani desert and the icy northern island of Novaya Zemlya (in addition to nearly two decades as a scientist in Moscow). In the course of negotiations concerning the verification provisions of the Threshold Test Ban Treaty and Peaceful Nuclear Explosions Treaty, he participated in Joint Verification Experiments (JVE) in Nevada and Semipalatinsk in 1988. He also participated in bilateral negotiations in Geneva. His involvement in the experiments was undoubtedly due to his past experience in above- and below-ground testing and knowledge and understanding of testing equipment.

Mikhailov's involvement in the JVEs and negotiations on verification measures to be implemented according to the Peaceful Nuclear Explosions Treaty (PNET) increased his recognition in Moscow. He was appointed Deputy Director of the Ministry of Atomic Power and Industry (MAPI) in 1989 shortly after his return from Geneva. His responsibilities at MAPI included nuclear warhead research, testing, and production. He served as deputy director until shortly after the 1991 failed coup, when the leaders of MAPI were officially relieved of their positions along with most other leading Soviet-era bureaucrats.

⁷Ibid.

⁸Ibid.

⁹Ibid.

The details of Mikhailov's activity during and after the coup are sketchy. He describes August 1991 as a confusing time when he fought to preserve the Russian atomic complex. He implies that he was pressured to choose sides between Yeltsin and the coup plotters, but does not clarify the position he took. In his book, he simply attacks the policies of Gorbachev, a criticism both the hard-line plotters and Yeltsin held. "I feel that Gorbachev has to take the blame for the attempt to demolish the military-industrial complex," writes Mikhailov.¹⁰ It would seem that this sentiment settled well with Russian President Boris Yeltsin at a January 1992 conference with scientists and administrators where, "for the first time in all the years of perestroika . . . the leader of the country . . . conferred with the principles of the atomic industry," according to Mikhailov.¹¹ He was apparently referring to financial 'principles' since the meeting with Yeltsin "assured [him] that the country's atomic industry would live" even after years of "cost-accounting perestroika," which had harmed Russia's atomic sector.¹²

Yeltsin created Minatom out of MAPI in January 1992 and appointed Mikhailov as its head in March of the same year. Information concerning Mikhailov's appointment is limited. Vitaly Konovalov, former MAPI head, was originally considered a leading candidate for Minatom director, as was Boris Nikipelov, Konovalov's former first Deputy for Nuclear Materials. Mikhailov, who served under Nikipelov as Deputy Minister of MAPI, was scarcely mentioned by the media amidst speculation about the future Minatom director in 1992. Konovalov had been dismissed after August 1991 as director of MAPI, along with the entire Soviet cabinet; however, he and another former First Deputy Minister, Viktor Sidorenko, continued to run the nuclear ministry until a new director was nominated.¹³ Mikhailov was eventually appointed director of Minatom while Nikipelov and Konovalov, his former bosses, were appointed as advisor and First Deputy Minister respectively.

The reason Mikhailov was chosen is unclear. Lev Riabev, an acquaintance of Mikhailov's from Arzamas-16, was later appointed First Deputy Minister of Minatom by Mikhailov to serve as his "right hand" according to a Moscow official.¹⁴ Riabev's appointment curtailed Nikipelov's ministerial influence within the ministry; Nikipelov retained his title while acting as one of many advisor to Mikhailov. After Mikhailov was appointed director of Minatom, he appointed himself Scientific director of Arzamas-16, taking over from Y.B. Khariton, a key figure in the development of the first Russian atomic bomb.¹⁵ In this position he shares the responsibility for managing the institute with its director; the scientific director guides the scientific missions and policies of the

¹⁰Ibid.

¹¹Ibid.

¹²Ibid.

¹³*Nuclear Fuel*, "Arzamas-16 Physicist Named Minatom First Deputy Head," Hibbs, Mark, November 8, 1993, v. 18, n. 23, p. 1, (DIALOG).

¹⁴Ibid.

¹⁵*Making the Russian Bomb: From Stalin to Yeltsin*, Cochran, Thomas B.; Norris, Robert S.; Bukharin, Oleg A.; Westview Press, 1995.

institution, whereas the director serves as its administrator.¹⁶ However, one observer noted that Mikhailov's position at Arzamas is likely honorary in nature and that his responsibilities as scientific director are delegated to his subordinates.

Mikhailov grew up during the troubles of the "Great Patriotic War" (WW II) and followed a career in the national defense sector during the Cold War. His experiences during the war gave him reason to believe that his "motherland" could indeed be attacked by a foreign aggressor again. Many in Russia believed that a war between West and East was inevitable. According to Mikhailov, he followed a 'fated' path in the interest of national defense through the Soviet nuclear weapons program at Arzamas-16, "where the past and future of Mother Russia came together."¹⁷

Those who worked in the Soviet nuclear weapons program represented a social elite, both scientifically and bureaucratically. The esteemed national defense effort gave nuclear scientists a great deal of pride, but according to Mikhailov, awards, bonuses, and other special privileges were rare.¹⁸ For this reason, prestige and status in the Soviet and Russian system were as highly valued. Mikhailov's intimate connection with Russia's nuclear weapons program, past and present, supplies him with a prominent social status in addition to power and influence over Russia's nuclear complex. Today, many nuclear scientists working in Russia are experiencing serious financial hardships, yet they maintain their prestigious titles and bureaucratic positions. This only makes respect of one's position and title all the more important. Indeed, many observers have argued that Mikhailov demonstrates more interest in gaining 'prestige and jobs for his agency than in engaging the United States in constructive dialogue.'¹⁹ In this light, it is important to consider Russians' social status when analyzing their political motivations and actions.

Mikhailov's experiences during WW II, and the following Cold War years, probably fuel his strong patriotism and perhaps give rise to a certain xenophobia in his relations with the West. However, this same past may motivate him to support the causes of nuclear threat reduction. Mikhailov expresses a desire to avoid the dangers of nuclear war: "I did everything I could to prevent a repetition of the tragedy of war in our land, to keep the temptation to repeat the tragedy of Hiroshima and Nagasaki on our planet from entering anyone's mind, even the most reckless," writes Mikhailov.²⁰ As Mikhailov voices his opposition to the use of nuclear weapons, his support for threat reduction goals is implied; however, before addressing Mikhailov's approach to nuclear threat reduction, it

¹⁶*Making the Russian Bomb: From Stalin to Yeltsin*, Cochran, Thomas B.; Norris, Robert S.; Bukharin, Oleg A.; Westview Press, 1995, p. 32.

¹⁷*Ibid.*

¹⁸*Ibid.*

¹⁹*Arms Control Today*, "The Nunn-Lugar Program: No Time to Pull the Plug," Lockwood, Dunbar, June 1995, v. 25, n. 5, p. 8-13, (DIALOG).

²⁰*I Am a Hawk (Ya-Yastreb)* in Russian, 1993, signed to press 1 November 1993, p. 5-127; JPRS-TAC-94-010-L, "I Am a Hawk--Memoirs of Atomic Minister Mikhailov," Mikhailov, Viktor N., 24 August 1994, (World News Connection).

is necessary to analyze his motivations, the source of his power, and the manner in which he wields it.

Political Positioning

Mikhailov was given the heavy responsibility of directing Russia's nuclear future when he was appointed head of Minatom in March of 1992. Minatom was created by decree of President Yeltsin, 29 January 1992.²¹ It inherited the responsibilities of MAPI (1989-1992) and of its predecessor, the Ministry of Medium Machine Building (MMMB; 1953-1989)²². Its responsibilities are said to include:

- Production of all nuclear materials and uranium enrichment (including mining of uranium ore).
- Production of civilian- and defense-related nuclear reactors.
- Nuclear waste management.
- Nuclear and radiation safety.
- Nuclear policy.
- Research and production of civilian nuclear power technology, facilities, high-energy physics, and lasers.
- Warhead research, development, testing, and production (warhead fabrication).
- Nuclear weapons dismantlement.²³

Minatom's place in the government hierarchy is enigmatic at best. It is not one of the "power ministries" that are constitutionally required to report to the president.²⁴ And like many other ministry posts in the Russian government, Mihailov's position is not confirmed by parliament, a status that diminishes his incentive to answer to lawmakers;²⁵ however, Minatom's budget depends largely on the Russian state budget, which must be approved by parliament and gives him reason to maintain good relations with the legislature. Mikhailov is also a member of the Security Council, a status conferred to him in 1995.²⁶ There has been speculation that Mikhailov is able to obscure the ministry's

²¹*Nucleonics Week*, "Yeltsin Transforms MAPI Into Russian Atomic Energy Ministry," MacLachlan, Ann, February 6, 1992, v. 33, n. 6, p. 4, (DIALOG).

²²Ibid.

²³ Moscow *Vooruzheniye, Politka, Konversiya* in Russian, No. 3 (10), 1995 (Signed to press 18 December 1995), p. 12-17; FBIS-UMA-96-119-S, "Fifty Years of Ministry of Atomic Energy Work Are Aimed at Ensuring the Country's National Security," 19 June 1996, (World News Connection); also, *Making the Russian Bomb: From Stalin to Yeltsin*, Cochran, Thomas B.; Norris, Robert S.; Bukharin, Oleg A.; Westview Press, 1995, p. 32; and *Nucleonics Week*, "Yeltsin Transforms MAPI Into Russian Atomic Energy Ministry," MacLachlan, Ann, February 6, 1992, v. 33, n. 6, p. 4, (DIALOG).

²⁴*Economist*, "Reliability, Moscow-Style: Russia (Concerns About Civil Control Over Russian Agencies Resurfaces After Boris Yeltsin's May 1995 Summit With Bill Clinton)," May 13, 1995, v. 335, n. 7914, p. 53 (2), (DIALOG).

²⁵*Los Angeles Times*, "Moscow's Atomic Point Man," Efron, Sonni, July 15, 1995, p. A1, (DIALOG).

²⁶*Biography of Prof Viktor Mikhailov*, <http://www.uilondon.org/uiabs95/mikbio.html>.

activities from the eyes of the Russian government. As one observer asserted, "I consider the ministry both dangerous and out of control . . . He has taken advantage of the disarray in the Russian government to do what he wants."²⁷ However, the ministry is not entirely autonomous. Some US officials are less critical of the minister: "In some cases he may act alone, but in most cases he's acting with at least the tacit support of the Russian government."²⁸ Indeed, Minatom could not retain its power and influence without allies and at least the acquiescence of the president; ultimately, a presidential decree can quash Minatom's political influence.

Prime Minister Chernomyrdin is rumored to be favorable to Mikhailov, but there is little information to document this. Shortly after Minatom's conception, Mikhailov began pressing for the government's endorsement of a plan to bolster the federation's power supply with the construction of new nuclear reactors. The government endorsed the program, and Prime Minister Chernomyrdin signed it into law on December 28, 1992.²⁹ The decision-making role of the government relative to Minatom demonstrates Mikhailov's incentive to maintain close ties with the prime minister. Without support from Chernomyrdin and other key members of the government, Minatom's plans to expand could be sharply curtailed.

Ministry of Defense

Mikhailov has particular incentive to preserve healthy political relations with the powerful Russian Ministry of Defense (MOD), to which Minatom is closely linked. Minatom's relationship with MOD centers around Russia's nuclear warheads. Minatom works closely with MOD during the development and testing of nuclear weapons, whereas the defense ministry is ultimately responsible for the deployment, storage, and transportation of Russia's nuclear warheads.³⁰ The Main Directorate for Nuclear Weapons (The Twelfth Main Directorate) of the Ministry of Defense takes delivery of the weapons.

Since the emergence of disarmament treaties such as INF and START and the break-up of the Soviet Union, Minatom's relationship with MOD may have become less important. Russia's nuclear industry, like that of the US, was originally created with military intent. However, Russia's nuclear industry is evolving into an economically motivated business. Since 1992 Mikhailov has sought to expand Minatom's nuclear power capabilities,³¹ increase civil nuclear power and technology exports, and gain Western aid to convert the nuclear complex from a mainly military to a mainly civilian purpose. However, Minatom is still responsible for the maintenance and manufacture of Russia's nuclear warheads

²⁷ *Los Angeles Times*, "Moscow's Atomic Point Man," Efron, Sonni, July 15, 1995, p. A1, (DIALOG).

²⁸ *Ibid.*

²⁹ *Bulletin of the Atomic Scientists*, "Russia's Nuclear Elite on the Rampage," Popova, Lydia, April 1993, v. 49, n. 3, p. 14(3), (DIALOG).

³⁰ *Making the Russian Bomb: From Stalin to Yeltsin*, Cochran, Thomas B.; Norris, Robert S.; Bukharin, Oleg A.; Westview Press, 1995, p. 56, note. 9.

³¹ *Bulletin of the Atomic Scientists*, "Russia's Nuclear Elite on Rampage (Development of Nuclear Power Program)," Popova, Lydia, April 1993, v. 49, n. 3, p. 14 (3), (DIALOG).

under MOD's control. So long as the Russian military relies on nuclear deterrence, MOD is likely to take an active interest in the well-being of Minatom. Minatom's military responsibilities are unlikely to disappear in the foreseeable future.

Gosatomnadzor

The establishment of Gosatomnadzor (Russian Federal Oversight of Nuclear Radiation Safety or GAN) provides some insight into the powers of Mikhailov and Minatom. In December 1991, President Yeltsin created GAN by decree.³² GAN was originally formed to create a national nuclear safeguards system, establish a nation-wide accounting of Russia's radioactive substances, and regulate personnel handling nuclear materials. This civilian regulatory body was authorized to inspect both civilian and military nuclear facilities that handle radioactive materials.³³ However, both MOD and Minatom resisted GAN's authority from the start.

Mikhailov seems to have viewed GAN as a threat both to the growth of Minatom and to its control of Russia's nuclear complex. The new regulatory body promised to implement oversight over Russia's nuclear complex, which had otherwise operated in secret and only at the discretion of the Russian President (or formerly, the Communist Party elite) and itself. It became apparent that such oversight could hinder Minatom's industrial growth. Mikhailov has often voiced his plans to expand Minatom's nuclear energy production by upgrading existing nuclear reactors and building new ones.³⁴ When a GAN official concluded that "two research reactors must be immediately shut for safety reasons" in a review of the safety of 50 Soviet-design reactors, Minatom forced the firing of the employee, according to a Yeltsin advisor.³⁵ In December 1995, GAN warned several Russian reactor sites that they must solve waste-storage problems or be shut down.³⁶ Certain Russian reactor sites were using storage practices that GAN argued were not acceptable under "prevailing environmental standards." However, Minatom reportedly exerted "pressure" on the regulatory agency "to allow reactors to find sub-optimal solutions" for waste storage, which would not meet environmental standards in the West.³⁷ Mikhailov has reportedly forced the firings of other "whistle blowers" as well. Vladimir Kuznetsov said that he was fired from his position at GAN when he temporarily shut down 10 civilian nuclear reactors.³⁸ "God forbid you should cross Minatom," said Kuznetsov after he was fired. "It could have the most unpleasant

³²Moscow *Yadernyy Kontrol: Obozreniye Po Problemam Oruzhiya Massovogo Unichtozheniya V Rossii I Novykh Nezavisimykh Gosudarstvakh* in Russian, May 1996, n. 17, p. 18-19; FBIS-UST-96-023, "Nuclear Security and Gosatomnadzor," 24 June 1996, (World News Connection).

³³Ibid.

³⁴*Nucleonics Week*, "Financial Woes Force Minatom to Streamline Reactor Program," Hibbs, Mark, December 14, 1995, v. 36, n. 50, p. 1, (DIALOG).

³⁵*Inside NRC*, "GAN Under Pressure to Abandon Probes, Says Yeltsin Advisor," Hibbs, Mark, October 18, 1993, v. 15, n. 21, p. 7, (DIALOG).

³⁶*Nucleonics Week*, "GAN Tells Russian Reactors to Halt LLW/MLW Volume Growth," Hibbs, Mark, December 14, 1995, v. 36, n. 50, p. 11, (DIALOG).

³⁷Ibid.

³⁸*Los Angeles Times*, "Moscow's Atomic Point Man," Efron, Sonni, Saturday, July 15, 1995, Home Edition, p. A1, (DIALOG).

consequences.³⁹ Mikhailov's apparent ability to force the firing of GAN officials would seem to support claims that the regulatory body operates "at the discretion of Minatom and Russian Industry" and that it is powerless to fulfill its presidential directive.⁴⁰ Quashing GAN's authority was not necessarily an easy thing to accomplish. Minatom has benefited from the actions of MOD toward that end.

MOD was responsible for implementing the president's decree to allow GAN to inspect its nuclear storage facilities, but after GAN raised security concerns at a military nuclear facility, it was denied access to other sites.⁴¹ On June 26, 1995, President Yeltsin signed a decree revoking GAN's authority to regulate nuclear materials at military sites.⁴² MOD's political victory over GAN made it easier for Mikhailov to resist the prerogatives of the nuclear regulatory agency. GAN was unable to oppose Mikhailov's failure to recognize its oversight authority because it was not supported by legislation.⁴³ Mikhailov originally sought to designate Minatom's nuclear inventories as "civilian" and "strategic" in proposed legislation, allowing GAN access only to the civilian sites. The difference would likely have been arbitrary, allowing Mikhailov to grant or deny GAN access to inventories at will. However, shortly after MOD persuaded the president to limit GAN's jurisdiction to civilian nuclear sites, such maneuvers were unnecessary for Mikhailov. When it appeared that GAN would gain the legal authority it needed via the Atomic Energy Act, Yeltsin declined to sign the legislation. It was a victory for Mikhailov; it seemed that GAN would never gain the authority it needed to evolve into a potent oversight ministry. The fact that Yeltsin had signed a decree barring the regulatory body from military sites only a month earlier reduced the likelihood that the president would sign the law because it granted jurisdiction over both civilian and military sites.⁴⁴ MOD and Minatom's political interests often coincide; their common goal to strip GAN of its authority demonstrates this. However, the two ministries are not necessarily allies in other cases. Minatom may have acted in concert with MOD in this case, but this does not necessarily imply that the two ministries are inclined to defend one another politically.

Finances

Minatom loudly advertises its financial difficulties, although its actual assets and debts remain secret. Financial information dealing with the nuclear power industry in Russia is "classified" because of its dual civilian-military mission.⁴⁵ Reportedly, the cost of

³⁹Ibid.

⁴⁰*Inside NRC*, "GAN Under Pressure to Abandon Probes, Says Yeltsin Advisor," Hibbs, Mark, October 18, 1993, v. 15, n. 21, p. 7, (DIALOG).

⁴¹Moscow *Kuranty* in Russian, 15 August 1995, p. 4; FBIS-SOV-95-158, "Yeltsin Seen Yielding to Grachev on Nuclear Safety," (World News Connection).

⁴²*Arms Control Today*, "Before the Deluge? Assessing the Threat of Nuclear Leakage From the Post-Soviet States," Potter, William C., October 1995, v. 25, n. 8, p. 9-16, (DIALOG).

⁴³Moscow *Rossiyskaya Gazeta* in Russian, 28 December 1994, First Edition, p. 3; JPRS-TAC-95-001, "Nuclear Oversight Flaws Show Need for New Laws," (World News Connection).

⁴⁴*Arms Control Today*, "Before the Deluge? Assessing the Threat of Nuclear Leakage From the Post-Soviet States," Potter, William C., October 1995, v. 25, n. 8, p. 9-16, (DIALOG).

⁴⁵*Bulletin of the Atomic Scientists*, "Russia's Nuclear Elite on the Rampage," Popova, Lydia, April 1993, v. 49, n. 3, p. 14(3), (DIALOG).

Russia's nuclear fuel cycle is known only by "a few economists working in secret institutions".⁴⁶ The atomic ministry is dependent on the federal budget, although its shroud of secrecy reportedly allows it to lobby for funding without revealing its financial status.⁴⁷ In Mid-1995, Minatom had only received 70% of the funds promised to it by the 1995 Russian budget, according to Mikhailov.⁴⁸ There is reason to believe that claims of financial hardship are genuine. Many workers within the nuclear complex have gone without pay for extended periods of time; moreover, Mikhailov's ambitious plan to build 30 nuclear reactors in Russia was scaled back as a result of financial shortfalls.⁴⁹ Meanwhile, Minatom's apparent deficiency in funds is used to justify questionable revenue-generating deals; at the Uranium Institute's 1992 annual conference, Mikhailov voiced the need to "exploit [Russia's] nuclear resources . . . to help overcome its financial difficulties."⁵⁰ Indeed, Mikhailov has actively searched for ways to boost Minatom's revenue since its conception. He lobbied the US Congress in 1991 for financial assistance to dismantle decaying Russia nuclear warheads (efforts that partially inspired the Nunn-Lugar bill, according to some analysts).⁵¹ He offered to sell low-enriched uranium (LEU) blended down from highly enriched uranium (HEU) from dismantled warheads to Japan⁵² and later supported plans for such a sale to the US. And he has consistently attempted to sell nuclear reactors to foreign countries such as India, Iran, China, Cuba, and North Korea (though with limited success). Meanwhile, Minatom profits from the export of gold, silver, platinum, emeralds, and diamonds (in addition to plutonium and uranium). The ministry also controls construction enterprises, mines, and even farms that employ more than 50,000 workers.⁵³

Minatom needs money to maintain the safety and security of the nuclear complex. Thoughts of another nuclear disaster such as Chernobyl strike fear in the hearts of Western countries, as does the idea that poorly guarded nuclear materials could fall in the hands of terrorists. Russia's nuclear complex is indeed a potential nuclear threat if it is ailing financially, but it is uncertain to what degree this is true because Minatom's finances remain secret. Meanwhile, nuclear dangers are used as a tool to gain financial assistance from the West. For instance, Mikhailov rules out calls to close Russia's declining nuclear power stations, using their seemingly dangerous potential to lobby for

⁴⁶Ibid.

⁴⁷Ibid.

⁴⁸*Los Angeles Times*, "Moscow's Atomic Point Man," Efron, Sonni, July 15, 1995, p. A1, (DIALOG).

⁴⁹*Bulletin of the Atomic Scientists*, "Russia's Nuclear Elite on the Rampage," Popova, Lydia, April 1993, v. 49, n. 3, p. 14(3), (DIALOG).

⁵⁰*Nucleonics Week*, "Financial Woes Force Minatom to Streamline Reactor Program," Hibbs, Mark, December 14, 1995, v. 36, n. 50, p. 1, (World News Connection).

⁵¹*Modern Power Systems*, "Fighting for a New World Role: Uranium Institute Symposium on Future Nuclear Fuel Supplies," December 1992, v. 12, n. 12, p. 25(2), (DIALOG).

⁵²*Los Angeles Times*, "Moscow's Atomic Point Man," Efron, Sonni, July 15, 1995, p. A1, (DIALOG).

⁵³*Nucleonics Week*, "Minatom Chief Asks Japan to Buy Russian Ex-Warhead Uranium," Usui, Naoaki, October 18, 1993, v. 34, n. 43, p. 9, (DIALOG).

⁵⁴Ibid.

“western support . . . to modernize and make them safe.”⁵⁴ Although Mikhailov professes his commitment to nuclear safety, he rejects security concerns that nations such as Iran will gain nuclear weapons technology from the sale of Russian reactors, characterizing Western objections as an attempt to “squeeze [Minatom] out of the world nuclear market.”⁵⁵ Such a dichotomy on financial and security matters gives reason to analyze Minatom’s motivations to cooperate with the West on issues of nuclear threat reduction.

⁵⁴*Modern Power Systems*, “Fighting for a New World Role: Uranium Institute Symposium on Future Nuclear Fuel Supplies,” December 1992, v. 12, n. 12, p. 25(2), (DIALOG).

⁵⁵Moscow *Izvestiya* in Russian, 18 April 1996, p. 3; FBIS-SOV-96-076, “‘Experts’ Cited on Issues at Nuclear Summit,” (World News Connection).

Threat Reduction Relations

"We all want a world without weapons and wars. This is the dream of mankind, but I think we will still be living with this dream for a very long time."⁵⁶

Mikhailov voices his support for arms control, disarmament, and nuclear nonproliferation, but some of his actions and statements have given international observers reason for anxiety. Shortly after he was appointed Minister of Minatom, Mikhailov "welcomed" the reduction of nuclear weapons as a result of such treaties as START and INF, but he opposed putting an end to nuclear testing. Before Moscow's commitment to a CTBT, Mikhailov said in an interview, "I personally believe that there should not be a ban on nuclear explosions for peaceful purposes. Two or three nuclear explosions a year are simply essential for Russia."⁵⁷ He defended this position by arguing that the maintenance of Russia's nuclear weapons could not be achieved exclusively through simulations of nuclear explosions.⁵⁸ But recent statements suggest that the minister may have more in mind than weapons maintenance.

Mikhailov is pessimistic about the need for nuclear weapons disappearing in the near future: "I think that nuclear weapons, despite the present attitude of people toward these weapons, will guarantee the security of those people for many years to come."⁵⁹ "Russia's security can only be guaranteed by nuclear deterrence policies," says Mikhailov.⁶⁰ The expansion of the North Atlantic Treaty Organization (NATO) gives him reason to advocate the retention, even perhaps the extension, of the nuclear "security guarantee," despite existing treaties. According to Mikhailov, "NATO expansion eastward puts Russia in the face of the need to take a whole number of constructive decisions," including revisions of, or withdrawal from, arms control, disarmament, and nonproliferation agreements.⁶¹ Mikhailov advocates the strengthening of Russia's

⁵⁶Viktor Mikhailov, Abridged reprint from *Moscow Privitelstvenny Vestnik* in Russian, No. 1, 1992, Interview with V.N. Mikhailov by Yu. Popov and L. Chernenko, "The Keys to the Nuclear Arsenal;" *I Am a Hawk (Ya--Yastreb)--Memoirs of Atomic Energy Minister Mikhailov* in Russian, 1993, p. 5-127; JPRS-TAC-94-010-L, 24 August 94, (World News Connection).

⁵⁷*Moscow Yadernyy Control: Obozreniye Po Problemam Oruzhiya Massovaogo Unichtozheniya V Rossii I Novykh Nezavisimyykh Gosudarstvakh* in Russian, n. 2, February 1995, [signed to press 30 January 1995] p. 9-11; FBIS-SOV-95-046-S, "Minister Mikhaylov on Safeguarding of Nuclear Materials," 9 March 1995, (World News Connection).

⁵⁸Abridged reprint from *Moscow Privitelstvenny Vestnik* in Russian, No. 1, 1992, Interview with V.N. Mikhailov by Yu. Popov and L. Chernenko, "The Keys to the Nuclear Arsenal;" *I Am a Hawk (Ya--Yastreb)--Memoirs of Atomic Energy Minister Mikhailov* in Russian, 1993, p. 5-127; JPRS-TAC-94-010-L, 24 August 1994, (World News Connection).

⁵⁹*Ibid.*

⁶⁰*Bek*, "NATO's Expansion and Russia's Security," Prof. Viktor Mikhailov, Igor Andryushin, Alexander Chernyshov; 20 September 1996.

⁶¹*Ibid.*

strategic intercontinental missiles as well as its medium- and short-range missiles. He also advocates developing a "new generation" of nuclear arms in response to a security threat from NATO. Such proposals have destabilizing implications for many multilateral and bilateral agreements. Mikhailov indicates that Russia could carry out such "nuclear arms modernization" without testing within the framework of the Comprehensive Test Ban Treaty (CTBT); meanwhile, he suggests that Russia should consider withdrawing from the CTBT in the case that Russia interprets NATO expansion as a real threat to its security. Implementation of Mikhailov's proposals would also destabilize the Intermediate Nuclear Forces (INF) treaty, and the Strategic Arms Reduction Treaty (START), as well as doom the prospects for Russian ratification of START-II. "We may have to withdraw from the treaty on the elimination of medium- and shorter-range [INF] missiles and resume manufacture of these arms, if the threat [from NATO] becomes real," says Mikhailov.⁶² "Russia should not rush to ratify START-II and cut its strategic offensive arms . . . until the political picture has taken shape."⁶³ Clearly, Mikhailov's support for arms control, disarmament, and nonproliferation agreements, considered to be cornerstones of global security, is less than enthusiastic. Such a disposition raises questions about his dealings with US-Russian nuclear threat reduction efforts.

It is not clear how Mikhailov's provocative views fit into the context of official Russian foreign and domestic policy. Regardless of Mikhailov's views, the Russian government is pursuing a policy of nuclear threat reduction, as demonstrated by its support for NPT, START, and CTBT treaties and for the US CTR, Laboratory-to-Laboratory and other Government-to-Government programs. However, Mikhailov is largely responsible for implementing such programs and agreements; thus, his policies are critical to their effectiveness and integrity. In this respect, Mikhailov is sometimes said to be an obstacle to the negotiation and implementation of programs.

Difficulties with Mikhailov have centered around financial and secrecy concerns. As Russia disarms, Minatom has attempted to cut its niche out of the international nuclear market, while addressing the remaining threats posed by the nuclear infrastructure left behind by the collapse of the Soviet Union. Whereas before, Russia's nuclear infrastructure was adequately financed by the state, it is now struggling financially, while left with the additional responsibility of reducing threats posed by the remnants of Russia's nuclear arsenal. Mikhailov is also cautious about allowing access to Russia's nuclear weapons facilities; espionage on the part of the West is still a serious concern in Russia. In 1993, Minatom began to limit access when the Department of Energy (DOE) and the Department of Defense (DOD) hesitated to give firm commitments to cooperative projects.⁶⁴ As one US official said, "If there is no money, and no project [the Russians] don't want people from the outside rubber-necking around their labs."⁶⁵ Indeed, the US

⁶²Ibid.

⁶³Ibid.

⁶⁴*Nuclear Fuel*, "Political, Financial Problems Block Minatom's Military Conversion Route," Hibbs, Mark, 2 August 1993, v. 18, n. 16, p. 12, (World News Connection).

⁶⁵Ibid.

has complained that Minatom's reluctance to allow access to facilities and information have slowed progress, while Minatom protests that the US is too slow to disburse funds and that Minatom is not given greater discretion over spending. Bureaucratic stalemates are often bypassed only after a compromise is reached on either issue.

The US is actively participating in a wide range of threat reduction programs in cooperation with the Russian government. Three significant programs affected by Mikhailov and Minatom are as follows: (1) the US purchase of high-enriched uranium (HEU) from Russia, (2) the proposed construction of a nuclear weapons materials storage site at Mayak, (3) and the US sponsored materials protection, control, and accountability program, whether Government-to-Government or Laboratory-to-Laboratory. Before examining these programs, it is useful to review Mikhailov's role in negotiating verification protocols to nuclear test ban treaties, as the first precedent for his dealings with the West on issues of arms control.

Joint Verification Experiment

During the 1980's, Mikhailov emerged from the clandestine Soviet nuclear program amidst US-Soviet negotiations to clarify procedures verifying adherence to the Threshold Test Ban Treaty (TTBT) of 1974 and the Peaceful Nuclear Explosions Treaty (PNET) of 1976. Together the treaties limited nuclear tests to 150 kilotons. The Soviets eventually agreed to detailed on-site inspections of peaceful nuclear explosions (PNEs) to verify the PNET, setting a new precedent for openness in arms control agreements between the US and the Soviet Union. However, the US and Soviet Union differed over verification measures for the treaty. The US insisted on using a method called CORTEX which measures the yield of the underground nuclear blast by gauging the speed and distance traveled by the shockwave from the explosion(s). However, this method requires the presence of personnel from the other side at the test site to monitor the explosion. The Soviets advocated the use of the regionalseismic method, but the US objected to the method suggesting that it was not sufficiently effective. Mikhailov was the chief scientific advisor during negotiations in Geneva. The Soviet delegation eventually allowed the use of CORTEX as a verification measure; however, Mikhailov maintained his reservations. As he later noted, the use of CORTEX poses a "high probability of the discovery of extremely sensitive information about the nuclear weapon" detonated at the test.⁶⁶ Instead, he advocated the use of the non-intrusive regionalseismic method of verification in part because "it does not require the presence of personnel on the test site to take measurements."⁶⁷ Mikhailov's opposition toward a US presence during nuclear testing was consistent with previous Soviet reluctance to allow on-site inspections.⁶⁸

⁶⁶Abridged reprint from *Moscow Privitelstvenny Vestnik* in Russian, No. 1, 1992, Interview with V.N. Mikhailov by Yu. Popov and L. Chernenko, "The Keys to the Nuclear Arsenal," *I Am a Hawk (Ya--Yastreb)--Memoirs of Atomic Energy Minister Mikhailov* in Russian, 1993, p. 5-127; JPRS-TAC-94-010-L, 24 August 94, (World News Connection).

⁶⁷Ibid. (Mikhailov referred to the regionalseismic method as the "teleseismic" method in interview.)

⁶⁸The issue of on-site inspections hindered US-Soviet negotiations of the Limited Test Ban Treaty (LTBT) of 1963. The Soviet Union was willing to allow only three annual inspections while the US called for

While Mikhailov remains cautious about compromise of Russia's nuclear security, many who have dealt with the minister have described him as being in favor of cooperative US-Russian science experiments as well as other threat reduction projects. Furthermore, financial concerns are of increasing concern to the Minister. It is apparent that the matters of funding and security are inextricably linked to the progress of threat reduction programs.

HEU Purchase

A deal was announced in 1992 by the Bush administration to purchase Russian HEU from nuclear warheads dismantled as a result of arms control agreements.⁶⁹ The purpose of the HEU deal was originally very clear: to reduce the threat that dismantled nuclear weapons materials could be diverted, lost or stolen, and to provide Minatom with the necessary funds to bolster the security and safety of its declining nuclear infrastructure. However, US-Russian differences over matters of transparency soon threatened the viability of the program.

In February 1993 an agreement was signed by US Secretary of Energy, Hazel O'Leary, and Mikhailov committing the US to the purchase of 500 tons of HEU over twenty years.⁷⁰ According to the agreement, the Russians would blend down the HEU dismantled from warheads into 15,000 metric tons of low-enriched uranium (LEU) after which the US would purchase the material for future sale as commercial reactor fuel.⁷¹ The original draft of the agreement required that transparency measures be established before the contract could be implemented.

The U.S. Enrichment Corporation (USEC) was designated as the US contractor which would take delivery of the HEU. A memorandum of understanding (MOU) was signed in September 1993 by Minatom and USEC,⁷² followed by a January 1994 contract.⁷³ However, the agreement was concluded before transparency measures were established to verify that the LEU would originate from dismantled nuclear weapons and not stockpiled HEU or LEU.⁷⁴

eight. Eventually, it was agreed that compliance to the treaty could be achieved with national technical means (NTM), diffusing the obstructive problem of inspections (Fetter, Steve, *Toward a Comprehensive Test Ban*, 1988, Ballinger Publishing Company, Cambridge, Massachusetts).

⁶⁹ *Economist*, "Nuclear Weapons--Always with Us," June 17, 1995, (DIALOG).

⁷⁰ *Arms Control Today*, "Gore-Chernomyrdin Talks Resolve Several Outstanding Issues," September 1995, Medeiros, Evan, S. v. 25, n. 7, p. 26, 32 (DIALOG).

⁷¹ *Arms Control Today*, "Gore-Chernomyrdin Commission Expands Nuclear Security Cooperation," Medeiros, Evan S., July 1996, v. 26, n. 5, p. 25 (29), (DIALOG).

⁷² *Nuclear Fuel*, "Transparency Accord Removes A Bar to Transfer of Russian HEU to USEC," March 28, 1994, v. 19, n. 7, p. 6, (DIALOG).

⁷³ *Nuclear Fuel*, "HEU Deal Signed in Moscow by Timbers, Mikhailov; Terms Unchanged," Dizard III, Wilson; Hibbs, Mark, January 17, 1994, v. 19, n. 2, p. special, (DIALOG).

⁷⁴ *Ibid.*

Effective transparency measures verifying that the HEU blended into LEU originated from nuclear warheads would seem to require the US to gain some access to sensitive areas and information. Mikhailov balked at this prospect. He was understandably concerned that the US would acquire sensitive information about Russian nuclear weaponry and other secrets about its nuclear complex. Meanwhile, many US officials maintained that effective transparency measures could be achieved without sacrificing legitimate Russian nuclear weapons security concerns. To resolve the dispute over transparency, the matter was referred to the Gore-Chernomyrdin Commission. The DOE and Minatom eventually negotiated and signed a transparency accord on March 18, 1994 establishing that the US "shall have the right to implement transparency and access arrangements" at the relevant Russian nuclear facilities where the HEU would be blended down.⁷⁵ However, the Protocol did not clearly solve the transparency issue; rather, it led to further negotiations concerning the matter. It provided "a means to promote the objectives and the implantation of the MOU" and pledged "to continually improve transparency measures,"⁷⁶ acknowledging that much needed to be discussed before the matter of transparency is settled. At the fifth meeting of the Gore-Chernomyrdin Commission in Moscow, June 1995, Mikhailov agreed to allow the US to monitor and sample "the flow and contents of the pipes at or near the feed and blending points" during the diluting process and to provide copies of all "accounting, processing and operational control records" in reference to the conversion of HEU to LEU.⁷⁷ By July 1995, the first two shipments of LEU, 46 tons, arrived in the US.⁷⁸ The terms of the HEU agreement were met, but the transparency measures agreed upon in June 1995 were still viewed as inadequate by some DOE officials. As of July 1996, approximately 400 tones of LEU had been shipped to the US, while no agreement had yet been reached establishing adequate transparency measures.⁷⁹ In November 1996, the USEC and Minatom signed a \$2 billion, 5-year contract providing for the shipment of 132 tones of uranium to the US.⁸⁰ The agreement modifies the 20-year agreement by establishing the prices and quantities of uranium to be delivered over the next five years, whereas such terms were previously negotiated year by year. No agreement has yet been reached establishing a mechanism to verify that the HEU used to produce the LEU is coming from dismantled nuclear warheads, while deliveries of uranium continue. The US and Russia were still engaged in further transparency negotiations last September.⁸¹

⁷⁵*Nuclear Fuel*, "Transparency Accord Removes A Bar to Transfer of Russian HEU to USEC," March 28, 1994, v. 19, n. 7, p. 6, (DIALOG).

⁷⁶*Ibid.*

⁷⁷*Arms Control Today*, "Gore-Chernomyrdin Talks Resolve Several Outstanding Issues," Medeiros, Evan S., September 1995, v. 25, n. 7, p. 26, 32, (DIALOG).

⁷⁸*Ibid.*

⁷⁹*Arms Control Today*, "Gore-Chernomyrdin Commission Expands Nuclear Security Cooperation," Medeiros, Evan S., July 1996, v. 26, n. 5, p. 25 (29), (DIALOG).

⁸⁰*The Washington Times*, "5-Year Pact Set for U.S. to Step Up Buying Enriched Uranium From Russia," Thomas W. Lippman, 24 November 1996, p. A20.

⁸¹*Reuters*, "Russia, US Agree On Nuclear Disarmament Steps," September 18, 1996.

Mikhailov signed a protocol with the USEC allowing payment for LEU at the time of its delivery and for advance payment to Russia for future deliveries without actually implementing what the US considered to be reliable transparency measures.⁸² Many of his critics speculated that his stubbornness over transparency demonstrates a waffling commitment to threat reduction efforts, indicating that he is more interested in the billions of dollars Minatom stands to gain from the HEU deal than a verified reduction of nuclear danger. Some critics suggest the absence of transparency measures could cover sinister motives. Minatom might, for example, produce LEU from other sources than dismantled nuclear weapons and sell it as a way to crack the western uranium market. Reports that Russia has another 500 tones of HEU stored outside bombs only exacerbates such concerns.⁸³ Moreover, the exact amount of Russia's stockpile of nuclear materials is unknown. Without effective transparency measures, Minatom could easily supply the US with LEU produced from secret stocks of HEU not previously used in weapons without much difficulty, while secretly storing the HEU dismantled from nuclear warheads for later use. Again, Mikhailov has advocated the strengthening of Russia's security in response to NATO enlargement by modernizing, developing and deploying its nuclear arms systems. For this, the minister says, "Russia would need 300 tons of weapons-grade uranium."⁸⁴ The material could be obtained from nuclear arms dismantled under START-I and START-II treaties, according to Mikhailov.⁸⁵ Moreover, he says Russia "should be prepared well in advance" for possible threats posed by NATO. Many observers wonder if the minister is suggesting that the time is now for Russia to stockpile HEU for use in a possible weapons buildup. Such concerns raise serious doubts to Mikhailov's commitment to establishing what the US considers to be adequate transparency measures.

Mayak

As part of the CTR program, the US agreed to assist Minatom in the construction of a fissile material storage site to store plutonium pits dismantled from nuclear weapons. Construction for the storage facility was originally planned at Tomsk-7, then Minatom suggested that two sites be built, one at Tomsk, another at Chelyabinsk-65.⁸⁶ Eventually, the atomic energy ministry agreed to build the CTR-funded facility near the town of Chelyabinsk, at Mayak (Chelyabinsk-65), where a severe accident occurred in 1957, contaminating the area.⁸⁷

⁸²*Arms Control Today*, "Gore-Chernomyrdin Talks Resolve Several Outstanding Issues," Medeiros, Evan S, September 1995, v. 25, n. 7, p. 26 (32), (DIALOG).

⁸³*The Washington Times*, "Plan to Buy Russia's Uranium Falter," Kilzer, Lou; Imse, Ann; September 22, 1996, p. A9, (ACTA News, September 23, 1996, p. 6).

⁸⁴*Bek*, "NATO's Expansion and Russia's Security," Prof. Viktor Mikhailov, Igor Andryushin, Alexander Chernyshov; 20 September 1996.

⁸⁵*Ibid.*

⁸⁶*Nuclear Fuel*, "Minatom Shifting Gears on Plans to Build Fissile Storage Sites," Hibbs, Mark, October 24, 1994, v. 19, n. 22, p. 14, (DIALOG).

⁸⁷*Nuclear Fuel*, "Moscow's Iranian Commerce Clouds Progress on Nunn-Lugar Project," Hibbs, Mark, March 13, 1995, v. 20, n. 6, p. 8, (DIALOG).

The construction of a fissile material storage facility offers a great deal of increased security for Russian weapons-useable material, a benefit to US, Russian and, indeed, global security. It will concentrate plutonium pits at one location, reducing the threat that the material could be lost, stolen or diverted. Minatom will gain an adequate storage facility in which to safely store dismantled nuclear materials,⁸⁸ while the US will presumably gain greater confidence that Russian stored nuclear material has been effectively safeguarded, protected, and safely stored. Indeed, the US-Russian umbrella agreement for the facility stipulates that US officials "shall have the right to examine the use of any material, training, or other services provided, if possible, at sites of their location or use."⁸⁹ However, the mere existence of the umbrella agreement has done little to break the so-called Russian "cult of secrecy" surrounding its nuclear complex.

Since its conception, the proposed fissile material storage facility at Mayak has suffered an epidemic of bureaucratic problems. While both Russian and US agencies have been criticized for this, Minatom certainly shoulders much of the responsibility. Most difficulties have centered around the lack of a Minatom construction schedule, unannounced blueprint changes, and disputes over disbursement of US funds; however, the issue of transparency once again impeded threat reduction progress. Nunn-Lugar legislation stipulates that the President must verify annually that those receiving CTR funds agree that nuclear pits taken from nuclear warheads are not to be re-used for new weapons.⁹⁰ However, Mikhailov has not provided the US with adequate transparency measures to verify that the facility would indeed house plutonium extracted from dismantled nuclear weapons.⁹¹ Previously, the US threatened to scrap the planned facility entirely if Russia did not begin to cooperate on the issue of transparency.⁹² Many wondered if the minister truly wanted the construction of the storage facility for MPC&A purposes, or if he merely wanted the benefits of a new storage facility (not necessarily for the housing of plutonium "pits"), and *carte blanche* access to Nunn-Lugar funds to support Minatom's budget.

Indeed, Mikhailov has complained vehemently that DOD has not adequately and fairly disbursed funds. Previously, disbursement of CTR funds strongly encouraged the use of US (instead of Russian) contractors and equipment for construction of the facility. Mikhailov consistently demanded block payments up front to allow Russian services and equipment to build the facility, but the CTR pre-condition prevented such payments. One

⁸⁸US officials speculate the Russia may already possess enough space at existing MOD and Minatom sites to store warhead pits. (*General Accounting Office (GAO) Report*, "Weapons of Mass Destruction: Reducing the Threat from the Former Soviet Union," NSIAD-95-7, October 6, 1994, (WAIS Document Retrieval).

⁸⁹*Arms Control Today*, "The Nunn-Lugar Program: No Time to Pull the Plug," Lockwood, Dunbar, June 1995, v. 25, n. 5, p. 8-13, (DIALOG).

⁹⁰*Arms Control Today*, "Nunn-Lugar' On Track Despite Fissile Storage Facility Delays," Lockwood, Dunbar, December 1994, v. 24, n. 10, p. 20, 25, (DIALOG).

⁹¹*General Accounting Office (GAO) Report*, "Weapons of Mass Destruction: Status of the Cooperative Threat Reduction Program," 27 September 1996, GAO/NSIAD-96-222.

⁹²*Ibid.*

US source warned that if US contractors are not used "all the money could end up in Swiss bank accounts."⁹³ But other US officials have been less critical of Mikhailov's request for funds: "I think Mikhailov interpreted CTR legislation to mean Minatom would receive funds in lump sums. 'Allocated' funds in Mikhailov's view were most likely equal to 'disbursed' funds. When he found out millions of dollars were 'allocated' for the facility, he thought the US would simply hand them over." DOD has committed \$75 million for construction of the facility,⁹⁴ of which \$16 million has been spent on facility design.⁹⁵ The fact that Minatom was receiving only small percentages of CTR funds apparently gives the financially struggling ministry little reason to cooperate with the US on transparency measures.

The National Defense Authorization Act for FY95 amended restrictions on the use of foreign technology and expertise when applying Nunn-Lugar funds; Government-to-Government programs were encouraged to use US resources, but the new legislation made clear that they were not required to do so.⁹⁶ As a result, the US was allowed to use Russian contractors in the construction of the Mayak facility to a greater degree. Mikhailov favored this, since Russian contractors working on the facility were Minatom employees.

Construction at Mayak continues, as do negotiations over transparency measures. The US has authorized an additional \$66 million for the facility as part of FY 1997 Defense Authorization Bill.⁹⁷ The parties have yet to negotiate an agreement providing transparency measures which will track plutonium pits as they are dismantled from Russian nuclear warheads and subsequently stored at Mayak. US Energy Secretary Hazel O'Leary and Mikhailov recently met at the International Atomic Energy Agency's (IAEA) annual congress in Vienna to discuss transparency measures,⁹⁸ but little progress seems to have been made on establishing them. Russia agreed to place fissile material under IAEA inspection, but the amount was not specified, nor were the sites where such materials would be stored. This could suggest some movement by the Russians on transparency and verification, but the issue has yet to be concluded.

⁹³*Nuclear Fuel*, "Moscow's Iranian Commerce Clouds Progress on Nunn-Lugar Project," Hibbs, Mark, March 13, 1995, v. 20, n. 6, p. 8, (DIALOG).

⁹⁴*Post-Soviet Nuclear and Defense Monitor*, "Contract for Fissile Storage Facility in Russia to be Awarded in February," January 31, 1996, p. 4.

⁹⁵*Post-Soviet Nuclear and Defense Monitor*, "U.S. Firm Bechtel to Build Russian Fissile Material Storage Facility," March 12, 1996, p. 1.

⁹⁶"[I]t is the sense of Congress that...although activities conducted with [Nunn-Lugar] funds should, to the extent feasible, draw upon the United States technology and expertise, the United States should work with local contractors in Belarus, Kazakstan, Russia, and Ukraine when doing so would expedite more effective use of those funds..." *National Defense Authorization Act for Fiscal Year 1995 (Enrolled Bill (Sent to President))*, S.2182, SEC. 1209 (b3). Sense of Congress Concerning Safe and Secure Dismantlement of Soviet Nuclear Arsenal.

⁹⁷FY 1997 Defense Authorization Bill, Title XV--Cooperative Threat Reduction With States of Former Soviet Union, Sec. 1502 Fiscal Year 1997 Funding Allocations (a)(5) For planning and design of a storage facility for Russian fissile material, \$66,000,000.

⁹⁸*Reuters*, "Russia, US Agree on Nuclear Disarmament Steps," 18 September 1996.

Greater Minatom access to US funds has breathed new life into construction at Mayak, and it might seem that adequate transparency measures would follow, but in fact Mikhailov has yet to compromise on transparency where weapons are concerned. He may have modest incentive to actively pursue such measures now that Mayak funds are no longer restricted and he is receiving partial payment for HEU delivered to the US. It remains to be seen if further transparency measures will be negotiated and implemented with Mikhailov's support.

Materials Protection, Control & Accountability

As Russia suffered economic, political and social difficulties following 1991, it was feared that the integrity of methods for protecting nuclear materials would weaken. Scattered reports surfaced of criminal attempts to steal and sell Russian nuclear materials. However, Russia strongly denied that the security of its civilian or military nuclear storage sites was degraded. This assertion was later partially retracted; the government maintained that security surrounding MOD sites was strong, but acknowledged that security at other sites outside MOD control could be improved. Since then, numerous US materials protection, control, and accounting (MPC&A) programs have been established at various Minatom and other civilian sites where "direct use" nuclear materials are stored.⁹⁹

The US-Russian MPC&A program has evolved into two forms since its conception: Government-to-Government and Laboratory-to-Laboratory. The manner in which Minatom has dealt with these programs sheds some light on Mikhailov's priorities in the realm of threat reduction.

The original MPC&A program, funded by DOD, was negotiated directly between the US and Russian governments. The US negotiators experienced great difficulty in gaining access to storage sites where direct-use nuclear materials were held.¹⁰⁰ The program eventually implemented an MPC&A program at the low-enriched uranium facility at Elektrostal as a model for future projects; however, this was not a high priority site because direct use materials were not stored there. Mikhailov was reportedly skeptical about the program's potential and was reluctant to allow US access to sensitive storage sites before cooperative MPC&A regimes were successfully proven.¹⁰¹ Also, the fact that

⁹⁹According to the US General Accounting Office, "Direct use material' consisted of HEU and plutonium that is relatively easy to handle because it has not been exposed to radiation or has been separated from highly radioactive materials. Direct use materials presents a high proliferation risk because it can be used to manufacture a nuclear weapon without further enrichment or irradiation in a reactor." (*General Accounting Office (GAO) Report, "Nuclear Nonproliferation: Status of US Efforts to Improve Nuclear Material Controls in Newly Independent States,"* GAO/NSIA/RCED-96-89, March 8, 1996.)

¹⁰⁰*General Accounting Office (GAO) Report, "US Efforts to Strengthen Nuclear Material Controls in the Newly Independent States of the Former Soviet Union,"* March 8, 1996.

¹⁰¹*General Accounting Office (GAO) Report, "Nuclear Nonproliferation: Status of US Efforts to Improve Nuclear Material Controls in Newly Independent States,"* GAO/NSIA/RCED-96-89, March 8, 1996.

the CTR program required the use of US (as opposed to Russian) goods and services delayed progress, according to DOD officials.¹⁰²

In 1994 DOE initiated its own "Lab-to-Lab" MPC&A program to bypass stalled Government-to-Government programs.¹⁰³ It experienced immediate success. US and Russian laboratory personnel were able to avoid many of the impediments of official government discussions. Also, mutual feelings of personal and professional respect quickly grew between US and Russian Laboratory-to-Laboratory participants, adding to the program's success. According to a DOE official, Minatom granted the program access to several Russian sites where direct-use materials were processed or stored after the potential of the Lab-to-Lab MPC&A program was demonstrated at Arzamas-16. By 1995, both Laboratory-to-Laboratory and Government-to-Government programs were experiencing greater success; they were no longer required to use US goods and services after the National Defense Authorization Act for Fiscal Year 1995 was amended.¹⁰⁴ In 1995, once MPC&A programs were allowed to use Russian goods and services "where doing so would expedite more effectively use of those funds,"¹⁰⁵ Minatom allowed US personnel access to five facilities where direct-use material was stored.¹⁰⁶ In 1996, US programs were expanded to all known Minatom facilities where "direct-use materials outside of weapons" are stored with the exception of a few highly sensitive sites.¹⁰⁷

In this case, flow of US funds, along with the advantages offered by the Laboratory-to-Laboratory approaches, seems to have attributed to Mikhailov's willingness to allow access to sensitive nuclear material storage sites. It comes as no surprise that funding is important to Minatom; it can indeed be an influential factor to the financially struggling government ministry. However, while this strong financial motivation can work in the interest of US threat reduction programs, it can also lead to policy decisions which place the interests of nuclear threat reduction at risk. Minatom's decision to sell nuclear reactors to Iran is an example of such a danger.

¹⁰²Ibid.

¹⁰³*General Accounting Office (GAO) Report, "Weapons of Mass Destruction: Reducing the Threat From the Former Soviet Union: An Update,"* June 9, 1995.

¹⁰⁴*National Defense Authorization Act for Fiscal Year 1995 (Enrolled Bill (Sent to President)),* S.2182, SEC. 1209 (b3). Sense of Congress Concerning Safe and Secure Dismantlement of Soviet Nuclear Arsenal.

¹⁰⁵Ibid.

¹⁰⁶*General Accounting Office (GAO) Report, "Nuclear Nonproliferation: Status of US Efforts to Improve Nuclear Material Controls in Newly Independent States,"* GAO/NSIA/RCED-96-89, March 8, 1996.

¹⁰⁷Ibid.

The Iranian Reactor Deal

“Nuclear power stations won’t help Iran build the bomb. This is the same as saying delivery of nails will help them in this.”¹⁰⁸

Russia’s decision to supply Iran with nuclear reactors despite US objections exacerbated doubts of Mikhailov’s commitment to nonproliferation and raised concerns that Minatom itself may contribute to nuclear proliferation. The deal suggests that Mikhailov is able to strongly influence the Russian central government policy on nuclear issues, while reinforcing the premise that his financial concerns may lead to conflict with US nonproliferation objectives.

In the 1970s, Siemens AG agreed to build two 1,300-MW PWRs at Burshehr, Iran.¹⁰⁹ The reactors were never finished, however. The Islamic revolution in February 1979 brought construction to a halt. The Iran-Iraq war subsequently erupted and the Burshehr site on the Persian Gulf sustained physical damage as a result of Iraqi bombing raids. The German government has disallowed Siemens to return to finish construction of the reactors due to its suspicions that Iran is secretly pursuing a nuclear weapons program and US diplomatic pressure to suspend construction at Burshehr.

The Iranian nuclear reactor program was largely dead until Iran agreed to buy two VVER-design PWRs from Minatom.¹¹⁰ The US has opposed the sale from the beginning; however, when the US discovered that Minatom planned to sell gas centrifuges to Iran with the reactors, Washington protested the deal more vehemently. Obtaining centrifuges would enable Iran to enrich uranium to weapons grade nuclear material.¹¹¹ President Clinton raised the issue with Russian President Yeltsin during a summit meeting in Moscow, pressuring him to bar delivery of the centrifuges and opposing the reactor deal as a whole.¹¹² Mikhailov characterized Western nuclear powers’ objection to the deal as an attempt to “close [Russia] off from a market which . . . [they] seek to appropriate for commercial interests.”¹¹³ This is a weak claim, however, since it is unlikely that any

¹⁰⁸Viktor Mikhailov, *Guardian*, “Russia Sees Rich Reward in Iranian Links,” May 31, 1995, p. 10, (DIALOG).

¹⁰⁹*Nucleonics Week*, “Minatom Says it Can Complete Once Siemens PWR in Iran in Five Years,” Hibbs, Mark, September 29, 1994, v. 35, n. 39, p. 3, (DIALOG).

¹¹⁰*Nuclear Fuel*, “U.S. Wants Russian to Take Back Any Spent Fuel from Iran Deal,” MacLachlan, Ann, September 28, 1992, v. 17, n. 20, p. 4, (DIALOG).

¹¹¹*Guardian*, “Russia Sees Rich Reward In Iranian Links,” May 31, 1995, p. 10, (DIALOG).

¹¹²*Economist*, “Reliability, Moscow Style: Russia,” May 13, 1995, v. 335, n. 7914, p. 53(2), (DIALOG).

¹¹³Madrid *ABC* in Spanish, 17 April 1995, p. 30; FBIS-SOV-95-014-L, “Iran Nuclear Pullout Would Be ‘Disgrace’--Mikhaylov: U.S. Plays ‘Double Game’,” (World News Connection).

Western nation would provide Iran with nuclear reactors in the face of US diplomatic pressure.

The US claims that Iran is attempting to build a clandestine nuclear weapons program in violation of the Nuclear Non-proliferation Treaty (NPT); however, Russia is dismissive about such reports. Minatom, in particular, has scoffed at intelligence reports supplied to Russia by the US which are designed to support claims that Iran has plans to build a nuclear weapon. Mikhailov refers to the text of the NPT to justify the transfer of nuclear technology to Iran. "The text says that the nuclear countries are obligated to help the non-nuclear countries who have signed the treaty to incorporate the latest technologies for peaceful purposes," says the minister.¹¹⁴ Indeed, the treaty states:

"Parties to the Treaty in a position to do so shall also cooperate in contributing alone or together with other States or international organizations to further development of the applications of nuclear energy for peaceful purpose, especially in the territories of non-nuclear-weapons States Party to the Treaty..."¹¹⁵

The NPT also provides that equipment or material provided to non-weapons states be subject to IAEA safeguards:

"Each State Party to the Treaty undertakes not to provide: (a) source or special fissionable material, or (b) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes unless the source or special fissionable material shall be subject to the safe guards required by this Article."¹¹⁶

Mikhailov has argued that because Iran has complied with the NPT condition that its nuclear facilities be subject to IAEA inspection the deal should be allowed.¹¹⁷ However, a central theme of the treaty states that signatories agree "not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices . . ."¹¹⁸ The sale of gas centrifuges or reactors to Iran amidst wide reports of the existence of a secret Iranian nuclear weapons program is emphatically opposed by the US and often characterized as being provocative to the purposes of nuclear non-proliferation, regardless of the application of safeguards.

¹¹⁴Moscow *Yadernyy Kontrol: Obozreniye Po Problemam Oruzhiya Massovaogo Unichtozheniya V Rossii Novykh Nezavisimyykh Gosudarstvakh* in Russian, n. 2, February 1995 [signed to press 30 January 1995] p. 9-11; FBIS-SOV-95-046-S, "Minister Mikhailov on Safeguarding of Nuclear Materials," 9 March 1995, (World News Connection).

¹¹⁵*Treaty on the Non-Proliferation of Nuclear Weapons* (1968), Article IV (2), UNTS No. 10485, vol. 729, p. 169-175.

¹¹⁶*Ibid.*

¹¹⁷Madrid *ABC* in Spanish, 17 April 1995, p. 30; FBIS-SOV-95-014-L, "Iran Nuclear Pullout Would Be 'Disgrace'--Mikhaylov: U.S. Plays 'Double Game'," (World News Connection).

¹¹⁸*Treaty on the Non-Proliferation of Nuclear Weapons* (1968), Article III (2), UNTS No. 10485, vol. 729, p. 169-175.

Minatom's plan to sell reactors to Iran was well known, but its plan to sell gas centrifuges as part of the deal was not. Reportedly, Mikhailov negotiated the agreement to sell the gas centrifuges to Iran without informing Yeltsin or other ministries.¹¹⁹ Even after this "side deal" was discovered, Mikhailov maintained that the Burshehr contract had "nothing to do with military programs."¹²⁰ However, many sources within the Russian government were skeptical of such claims. Then Russian Foreign minister Andrey Kozyrev admitted that he could not "guarantee that Iran will play it clean," referring to the possibility that the Islamic nation might use Russian nuclear technology to construct nuclear arms.¹²¹ Meanwhile, former director of the Russian Foreign Intelligence Service, Igor Primakov, acknowledged Iran's nuclear intentions when he noted that it "has a program of military-applied research in the nuclear sphere," adding that "without scientific and technical assistance the appearance of nuclear weapons in Iran in this millennium is unlikely."¹²² Aleksey Yablokov, head of Russia's Security Council's interdepartmental commission for ecological safety, also objected to the Iranian reactor deal asserting that it would endanger Russian security.¹²³ Yablokov submitted a report to President Yeltsin outlining his objections without reference to the transfer of gas centrifuges. It was ignored. "[T]he opinion of Russian Nuclear Minister Mikhailov won," noted Yablokov.¹²⁴ While such objections were initially discarded by the Kremlin, Yeltsin eventually differed with Mikhailov's assertion that the gas centrifuges would be of no use to Iran, especially after the US Congress began to consider legislation which would cut off aid to Russia if it carried out the deal with Iran. Under U.S. pressure, the Russian President acknowledged that the deal included technology with the "potential for creating weapons-grade fuel" and agreed to "exclude those aspects from the contract,"¹²⁵ referring to the centrifuges. The US would have preferred that Russia scrap the deal entirely, but it never garnered such a concession. The matter was referred to the Gore-Chernomyrdin Commission, where it has languished. Gore reportedly failed to mention the Iranian deal at a 1996 meeting of the Commission.¹²⁶ Mikhailov has apparently taken "US non-mention" of the nuclear deal to mean that US-Russian discussion is closed on the matter. "Why should [the deal] be raised?" asked Mikhailov after the meeting. "They

¹¹⁹*Economist*, "Reliability, Moscow Style: Russia," May 13, 1995, v. 335, n. 7914, p. 53(2), (DIALOG).

¹²⁰Moscow *Informatsionnoye Agentstvo Ekho Moskvy* in Russian, 1230 GMT, 28 August 1995; FBIS-SOV-95-167, "Moscow Denies Secret Nuclear Deals With Iran--'No Secret Agreements Whatsoever'," (World News Connection).

¹²¹Madrid *ABC* in Spanish, 17 April 1995, p. 30; FBIS-SOV-95-014-L, "Iran Nuclear Pullout Would Be 'Disgrace'--Mikhaylov: U.S. Plays 'Double Game'," (World News Connection).

¹²²*Nucleonics Week*, "Countering U.S. Claims, Moscow Says Iran Nuclear Program is Peaceful," Hibbs, Mark, February 9, 1995, v. 36, n. 6, p. 4, (DIALOG).

¹²³Moscow *Interfax* in English, 0921 GMT, 15 April 1996, (FBIS-SOV-96, "Iranian Nuclear Power Plant Endangers Russian Security," 15 April 1996, p. 22).

¹²⁴*Ibid.*

¹²⁵*Bulletin of Atomic Scientists*, "An Iranian Bomb?" Albright, David, July-August 1995, v. 51, n. 4, p. 20(7), (DIALOG).

¹²⁶Moscow *ITAR-TASS* in English, 1113 GMT, 17 July 1996; FBIS-SOV-96-139, "Mikhaylov on US Nonmention of Russia-Iran Nuclear Deal," (World News Connection).

know my position, it is definite: we shall cooperate (with Iran). We built, are building and will build power plants."¹²⁷

The proposed centrifuge deal suggests that Mikhailov is capable and perhaps willing to act beyond the purview of the president and security council in the interest of securing funding. Meanwhile, other reports have surfaced that Minatom has signed another "secret agreement" with Iran to provide it with two additional reactors in the northern part of the country. Such reports only fuel fears that Minatom may supply the centrifuge technology to Iran anyway to finance its decaying infrastructure. In this light, Minatom's quest for cash could itself become a nuclear proliferation threat.

The monetary value of the deal has been reported as between \$650¹²⁸ million and \$3 billion.¹²⁹ Moderate speculation places its value around \$800 million.¹³⁰ Such a deposit in cash strapped Minatom accounts is certainly strong motivation to successfully complete the deal, despite foreign pressure to scrap it. As Mikhailov himself said, "This was a real life-saver for the Russian nuclear industry," referring to the \$800 million he hoped to earn from the Iranian reactor deal.¹³¹ The income from the Iranian deal represents direct cash flow into Minatom accounts. The pressure on Minatom to scrap the reactor deal has waned, as demonstrated by Gore's "non-mention" of the deal in Moscow. And the financial benefits from the reactor deal do not entail sharp risks of loosing nuclear secrets, or opening up the Russian nuclear complex to scrutiny, as US threat reduction programs do. Thus, Mikhailov has little reason to back away from the reactor deal, discounting concerns of a nuclear weapons state emerging on Russia's southern periphery.

The Iranian deal seems to contradict Mikhailov's self proclaimed commitment to nonproliferation in the eyes of the West. It also suggests a degree of independence on the part of Minatom separate from what may be considered official Russian foreign policy. But while the reactor deal demonstrates Mikhailov's political influence, it also outlines his limits. He seems to have a great deal of latitude to form Minatom policy domestically and internationally as long as his plans do not blatantly violate Russian policy or interests. Mikhailov continues to influence Russia's nuclear complex with wide ranging powers given to him by Yeltsin. The minister's future remains dependent on that of the Russian state and its president.

¹²⁷Ibid.

¹²⁸*Guardian*, "Russia Sees Rich Reward in Iranian Links," May 31, 1995, p. 10, (DIALOG).

¹²⁹*Nuclear Fuel*, "U.S. Wants Russian to Take Back Any Spent Fuel from Iran Deal," MacLachlan, Ann, September 28, 1992, v. 17, n. 20, p. 4, (DIALOG).

¹³⁰*Bulletin of Atomic Scientists*, "An Iranian Bomb?" Albright, David, July-August 1995, v. 51, n. 4, p. 20(7), (DIALOG).

¹³¹Moscow *Rossiyskaya Gazeta* First Edition, 1 June 1995, p. 7; FBIS-SOV-95-106, "Nuclear Minister Accuses U.S. of 'Strong-Arm Pressure,'" (World News Connection).

Conclusions

“One must fight for the welfare of the people, for peace, and for the planet!”¹³²

Mikhailov's policies are controversial, but his actions must be viewed within a post-Cold War context. The minister grew to adulthood and spent most of his career in the Soviet system during two threatening eras of history. It is understandable that Mikhailov is defensive and distrustful of foreign nations. Few years have passed since the relaxation of tensions between East and West. Considering the status of US-Russian relations ten years ago, it is amazing that US personnel are allowed to assist former states of the Soviet Union to dismantle their nuclear warheads, and guard their fissile materials, much less visit Russian nuclear weapons complex sites whose very existence was previously denied. Mikhailov has presided over Minatom's post-Cold War transition since 1992, but he has not been hasty to provide extensive access or transparency to the Russian nuclear weapons complex, or to Russian nuclear material disposition. While the minister may be inflexible at times when negotiating terms of threat reduction programs, officials in the Russian government have reportedly claimed that a successor to Mikhailov would be more difficult to deal with.¹³³

Mikhailov's policies and views are sources of distress to many international observers, nonetheless. His reluctance to agree to transparency measures, his willingness to supply a pariah state such as Iran with nuclear technology, and his support for modernizing Russia's nuclear weapons in response to NATO enlargement casts a shadow over his commitment to the values and goals of nuclear threat reduction. Mikhailov continues to engage the West on such matters, but many doubt his motives. The minister has gained greater access to Nunn-Lugar funds for MPC&A programs and the Mayak facility, and he secured the US purchase of Russian HEU, while little definitive progress has been made on transparency matters. Many US officials argue that effective transparency measures can be achieved without sacrificing legitimate Russian nuclear weapons security concerns. Nonetheless, Mikhailov is reluctant to provide the US with transparency on nuclear materials supposedly dismantled from warheads. Mikhailov continues to participate in transparency negotiations, but his incentives for agreeing may have diminished now that he has greater access to US funds. Meanwhile, there is little indication that Minatom has surpassed its financial difficulties. Until Russia is financially secure, Mikhailov is likely to stay at the negotiation table. Patience may be the key to piercing Mikhailov's so-called "shroud of secrecy."

¹³²Viktor Mikhailov, *I Am a Hawk (Ya--Yastreb)* in Russian, 1993, signed to press 1 November 1993, p. 5-127; JPRS-TAC-94-010-L, "I Am a Hawk--Memoirs of Atomic Minister Mikhailov," Mikhailov, Viktor N., 24 August 1994, (World News Connection).

¹³³*Los Angeles Times*, "Moscow's Atomic Point Man," Efron, Sonni, Saturday, July 15, 1995, p. 1A, (DIALOG).

Mikhailov's future is uncertain given the unpredictability of Russian politics, but there is not necessarily reason to believe that Mikhailov will be replaced in the near future. His political future is closely linked with that of President Yeltsin. The president kept Mikhailov on as Minister of Minatom after the 1996 presidential election; however, Yeltsin's health is often uncertain. Yeltsin is presently recovering from quintuple bypass heart surgery. Should the president die, or his power and influence wane due to health problems, a power struggle would likely ensue. A successor to Yeltsin will undoubtedly entail a shake-up of the Russian government. Prime Minister Chernomyrdin, retired General Alexander Lebed, Moscow Mayor Luzhkov, and Communist leader Gennadii Zyuganov have all been named as possible successors to Yeltsin. Mikhailov takes a low profile amidst power struggles in Moscow. Again, his position during the August 1991 failed coup remains obscure. Today, his name rarely appears in the Russian press amidst the speculative storm of media reportage concerning the future of the Russian presidency. Even after a new government was formed after Yeltsin was elected President in July 1996, Mikhailov's name was barely mentioned in the Russian press, whereas figures such as Rodionov, Kulikov, Korzhakov and Barsukov were in the daily headlines. Mikhailov's low profile makes him a less susceptible political target. This may explain why he has consistently managed to survive politically in Moscow.

Many who have had dealings with Mikhailov describe him as stubborn and willful, but few note that he is keen on continuing the nuclear arms race. However, while the minister appears to support the disarmament process, demonstrated by his willingness to engage the West on such matters, he also views Russia's nuclear weapons complex as its last line of national defense. This duality presents an unpredictable characteristic in the man largely responsible for the implementation of nuclear threat reduction programs and agreements in Russia. The steps it will take to complete the disarmament process are uncertain with such a complex character to tend with. As he Mikhailov notes: "We all applaud the two great powers' steps to reduce their nuclear arsenals . . . [but] there are still many political whirlpools and submerged rocks on the way to this."¹³⁴

¹³⁴*I Am a Hawk (Ya--Yastreb)* in Russian, 1993, signed to press 1 November 1993, p. 5-127; JPRS-TAC-94-010-L, "I Am a Hawk--Memoirs of Atomic Minister Mikhailov," Mikhailov, Viktor N., 24 August 1994, (World News Connection).

Viktor N. Mikhailov: Russia's Atomic Tsar

Chronology

12 February 1934--Born, Sopronovo, Moscow Oblast. Participated in Pioneer Camp during his youth.

1941--Forced to leave the city of Kalinin as a war refugee. Father killed and older sister died of illness and consumption during WWII.

1941-1942--Spent portion of the winter in Lesnyy Rayon, north of Tver Oblast as a result of the war.

1942--Returned to Kalinin. Viewed the wreckage of the city. Impressed him to prevent the ravages of war.

1945--Moved to northern city of Nikel across the Barents Sea.

1952--Graduated from secondary school in Nikel and was admitted to the Moscow Engineering Physics Institute where he met his wife. He showed an interest in nuclear physics in secondary school.

1958--Graduated from the Moscow Engineering Physics Institute with honors and a specialty in "Theoretical Nuclear Physics." Ya.B. Zeldovich was his thesis advisor, his first real connection to the Soviet Nuclear program. Zeldovich asked him to test for a job at Arzamas-16.

Traveled to Arzamas-16, the "installation", after graduation where he worked in the All-Union Scientific Research Institute of Experimental Physics. Worked on the theory of pulse fission reactors and studied nuclear explosion processes. Worked with the two theoretical divisions of Arzamas-16 headed by A.D. Sakharov and Zeldovich. He gained experience in weapons production in addition to theory.

1959--Made first trip to nuclear test site at Semipalatinsk in Kazakstan to view an atmospheric nuclear explosion.

1966--First Traveled to Novaya Zemlya where underground nuclear testing was conducted. He received the Lenin Prize in 1967. There he participated in underground nuclear testing until approximately 1969.

1969-- Traveled to Moscow where he worked on diagnostic methods and systems to record high-speed processes at the Moscow Impulse Engineering Institute responsible for the development of diagnostic equipment used during nuclear tests.

1974--Threshold treaty on the limitation of the yield of underground nuclear blasts.

1976--Treaty limiting underground nuclear explosions for peaceful purposes.

1982--Won the State Prize.

1987--Traveled abroad for the first time to the GDR.

1988--Appointed head of the Moscow Impulse Engineering Institute.

August 1988--Nevada Joint Verification Experiment (JVE)

September 1988--Semipalantinsk JVE.

31 May 1988--Traveled to Geneva, Switzerland for bilateral talks with the US on the results of JVEs.

1989--Appointed Deputy Director of the Ministry of Atomic Power and Industry (MAPI).

24 October 1990--Last nuclear explosion at Novaya Zemlya.

August 1991--Failed coup.

28 January 1992--Ministry of Atomic Energy created by presidential decree.

March 1992--Appointed head of Minatom

December 1992--Self appointed as scientific operations at VNIIEF.

August 1996--Reappointed head of Minatom

Source: "I Am a Hawk (Ya--Yastreb)." (*Ya-Yastreb* in Russian, 1993, signed to press 1 November 1993, p. 5-127; JPRS-TAC-94-010-L, "I Am a Hawk--Memoirs of Atomic Minister Mikhailov," Mikhailov, Viktor N., 24 August 1994, (World News Connection).

Russia's Atomic Tsar: Viktor N. Mikhailov Bibliography

The Internet

Biography of Prof. Viktor Mikhailov, <http://www.uilondon.org/uiabs95/mikbio.html>

Milestones in the Creation and Development of the Nuclear Industry, Minatom's History, <http://www.ai.x-atom.net/minatom/steps.html>

Secondary Sources

Making the Russian Bomb: From Stalin to Yeltsin, Thomas B. Cochran, Robert S. Noris, and Oleg A. Bukharin, Westview Press, Boulder-San Francisco-Oxford, 1995

I Am a Hawk (Ya--Yastreb) in Russian, 1993, signed to press 1 November 1993, p. 5-127; JPRS-TAC-94-010-L, "I Am a Hawk--Memoirs of Atomic Minister Mikhailov," Mikhailov, Viktor N., 24 August 1994, (World News Connection).

Fetter, Steve, *Toward a Comprehensive Test Ban*, Ballinger Publishing Company, Cambridge, Massachusetts, 1988.

Primary Sources

Arms Control Today

Arms Control Today, "Nunn-Lugar' On Track Despite Fissile Storage Facility Delays," Lockwood, Dunbar, December 1994, v. 24, n. 10, p. 20, 25, (DIALOG).

Arms Control Today, "U.S.-Russian Talks on Nuclear Issues Find Progress Slow at Moscow Round," Lockwood, Dunbar, January 1995, v. 25, n. 1, p. 22, (DIALOG).

Arms Control Today, "The Nunn-Lugar Program: No Time to Pull the Plug," Lockwood, Dunbar, June 1995, v. 25, n. 5, p. 8-13, (DIALOG).

Arms Control Today, "Gore-Chernomyrdin Talks Resolve Several Outstanding Issues," Medeiros, Evan S., September 1995, v. 25, n. 7, p. 26, 32, (DIALOG).

Arms Control Today, "Before the Deluge? Assessing the Threat of Nuclear leakage From the Post-Soviet States," Potter, William C., October 1995, v. 25, n. 8, p. 9-16, (DIALOG).

BBC Monitoring Service

BBC Monitoring Service, "Atomic Energy Minister Mikhaylov Previews Nuclear Safety Summit," April 18, 1996, (DIALOG).

Bulletin of the Atomic Scientists

Bulletin of the Atomic Scientists, "Russia's Nuclear Elite on Rampage," Popova, Lydia, April, 1993, v. 49, n. 3, p. 14(3), (DIALOG).

Bulletin of the Atomic Scientists, "An Iranian Bomb?" Albright, David, July-August 1995, v. 51, no. 4, p. 20(7), (DIALOG).

Christian Science Monitor

Christian Science Monitor, "Struggling to Cut the Half-Life of Moscow's Nuclear Mess," Sommer, Mark, August 18, 1993, p. 18, (DIALOG).

Christian Science Monitor, "Despite Pact, Russia Lags on Plutonium," Grier, Peter, Wednesday, December 28, 1994, p. 1, (DIALOG).

Economist

Economist, "Reliability, Moscow -Style: Russia (Concerns About Civil Control Over Russian Agencies Resurfaces After Boris Yeltsin's May 1995 Summit With Bill Clinton," May 13, 1995, v. 335, n. 7914, p. 53(2), (DIALOG).

Economist, "Nuclear Weapons--Always with Us," June 17, 1995, (DIALOG).

Foreign Affairs

Foreign Affairs, "The Plutonium Genie," Perkovich, George, Summer 1993, v. 72, n. 3, p. 153-165, (DIALOG).

Foreign Broadcast Information Service

Moscow *Interfax* in English, 0921 GMT, 15 April 1996, (FBIS-SOV-96, "Iranian Nuclear Power Plant Endangers Russian Security," 15 April 1996, p. 22.

Moscow *Rossiyskiye Vesti* in Russian, 16 April 1996, p. 2; FBIS-SOV-96-075, "Minister Mikhaylov Interviewed on Nuclear Safety Issues," 17 April 1996, p. 23.

Sovetskaya Rossiya Moscow in Russian, 2 April 1996, p. 3; FBIS-UMA-96-100-S, "Past Achievements, Current Plight of Arzamas-16," 22 May 1996, p. 53.

Moscow *Vooruzheniye, Politika, Knoversiya* in Russian, no. 3(10), 1995 (Signed to Press 18 December 1995) p. 12-17; FBIS-UMA-119-S, "Fifty Years of Ministry of Atomic Energy Work Are Aimed At Ensuring the Country's National Security," 19 June 1996, p. 8.

General Accounting Office (GAO) Reports

General Accounting Office (GAO) Report, "Weapons of Mass Destruction: Reducing the Threat from the Former Soviet Union," NSIAD-95-7, October 6, 1994, (WAIS Document Retrieval).

General Accounting Office (GAO) Report, "US Efforts to Strengthen Nuclear Material Controls in the Newly Independent States of the Former Soviet Union," March 8, 1996.

General Accounting Office (GAO) Report, "Weapons of Mass Destruction: Status of the Cooperative Threat Reduction Program," 27 September 1996, GAO/NSIAD-96-222, (WAIS Document Retrieval)..

Guardian

Guardian, "Russia Sees Rich Reward in Iranian Links," May 31, 1995, p. 10, (DIALOG).

Inside NRC

Inside NRC, "GAN Under Pressure to Abandon Probes, Says Yeltsin Advisor," Hibbs, Mark, October 18, 1993, v. 15, n. 21, p. 7, (DIALOG).

Los Angeles Times

Los Angeles Times, "Moscow's Atomic Point Man," Efron, Sonni, Saturday, July 15, 1995, p. 1A, (DIALOG).

Modern Power Systems

Modern Power Systems, "Fighting for a New World Role: Uranium Institute Symposium on Future Nuclear Fuel Supplies," December 1992, v. 12, n. 12, p. 25(2), (DIALOG).

Nuclear Fuel

Nuclear Fuel, "U.S. Wants Russian to Take Back Any Spent Fuel from Iran Deal," MacLachlan, Ann, September 28, 1992, v. 17, n. 20, p. 4, (DIALOG).

Nuclear Fuel, "Political, Financial Problems Block Minatom's Military Conversion Route," Hibbs, Mark, August 2, 1993, v. 18, n. 16, p. 12, (DIALOG).

Nuclear Fuel, "Watchdogs Say Minatom Withholding Material Theft and Diversion Data," Hibbs, Mark, August 16, 1993, v. 18, n. 17, p. 1, (DIALOG).

Nuclear Fuel, "Arzamas-16 Physicist Named Minatom First Deputy Head," Hibbs, Mark, November 8, 1993, v. 18, n. 23, p. 1, (DIALOG).

Nuclear Fuel, "HEU Deal Signed in Moscow by Timbers, Mikhailov; Terms Unchanged," Dizard III, Wilson, January 17, 1994, v. 19, n. 2, p. special, (DIALOG).

Nuclear Fuel, "Mikhailov Proposal For Joint Venture to Process U.S., Russian HEU Bared," January 31, 1994, v. 19, no. 3, p. 15, (DIALOG).

Nuclear Fuel, "Transparency Accord Removes A Bar to Transfer of Russian HEU to USEC," March 28, 1994, v. 19, n. 7, p. 6, (DIALOG).

Nuclear Fuel, "Russian Data Suggests Seized Pu was Enriched by Arzamas-16 Calutron," Hibbs, Mark, August 15, 1994, v. 19, no 17, p. 9, (DIALOG).

Nuclear Fuel, "Minatom Shifting Gears on Plans to Build Fissile Storage Sites," Hibbs, Mark, October 24, 1994, v. 19, no. 22, p. 14, (DIALOG).

Nuclear Fuel, "Moscow's Iranian Commerce Clouds Progress on Nunn-Lugar Project," Hibbs, Mark, March 13, 1995, v. 20, n. 6, p. 8, (DIALOG).

Nuclear Fuel, "Europeans Term 'Worthless' Minatom Claim that no HEU or Pu is Missing," Hibbs, Mark, March 27, 1995, v. 20, n. 7, p. 12, (DIALOG).

Nuclear Fuel, "Minatom Views on HEU Deal, and a Senator's Response," June 19, 1995, v. 20, n. 13, p. 4, (DIALOG).

Nucleonics Week

Nucleonics Week, "Yeltsin Transformed MAPI into Russian Atomic Energy Ministry," Macklachlan, Ann, February 6, 1992, v. 33, no. 6, p. 4, (DIALOG).

Nucleonics Week, "Minatom Vice Minister Slams U.S., German Supply Policy," Hibbs, Mark, September 16, 1993, v. 34, n. 37, p. 2, (DIALOG).

Nucleonics Week, "GAN Under Pressure to Abandon Probes, Says Yeltsin Advisor," Hibbs, Mark, October 18, 1993, v. 15, n. 21, p. 7, (DIALOG).

Nucleonics Week, "Minatom Chief Asks Japan to Buy Russian Ex-Warhead Uranium," Usui, Naoaki, October 28, 1993, v. 34, n. 43, p. 9, (DIALOG).

Nucleonics Week, "Cash-Strapped Minatom Holds on Anticipating Promised Relief," MacLachlan, Ann, June 16, 1994, v. 35, no. 24, p. 11, (DIALOG).

Nucleonics Week, "GOSATOMNADZOR Now Scrutinizing Minatom Report on RT-1 Accident," Hibbs, Mark, September 8, 1994, v. 35, no. 36, p. 2, (DIALOG).

Nucleonics Week, "Minatom Says It Can Complete One Siemens Pwr In Iran in Five Years," Hibbs, Mark, September 29, 1994, v. 35, no. 39, p. 3, (DIALOG).

Nucleonics Week, "Moscow Rejects Minatom-India Deal Without Full-Scope Safeguards," Hibbs, Mark, February 2, 1995, v. 36, no. 5, p. 10, (DIALOG).

Nucleonics Week, "Countering U.S. Claims, Moscow Says Iran Nuclear Program is Peaceful," Hibbs, Mark, February 9, 1995, v. 36, n. 6, p. 4, (DIALOG).

Nucleonics Week, "GAN Tells Russian Reactors to Halt LLW/MLW Volume Growth," Hibbs, Mark, December 14, 1995, v. 36, n. 50, p. 11, (DIALOG).

Nucleonics Week, "Financial Woes Force Minatom to Streamline Reactor Program," Hibbs, Mark, December 14, 1995, v. 36, n. 50, p. 1, (DIALOG).

Post-Soviet Nuclear and Defense Monitor

Post-Soviet Nuclear and Defense Monitor, "Contract for Fissile Storage Facility in Russia to be Awarded in February," January 31, 1996, p. 4.

Post-Soviet Nuclear and Defense Monitor, "U.S. Firm Bechtel to Build Russian Fissile Material Storage Facility," March 12, 1996, p. 1.

Star Tribune

Star Tribune, "Russia Lacks Nuclear Watchdog Security For Bomb Materials Falls Short, Experts Say," Grordon, Michael R., Friday, August 19, 1994, p. 4A, (DIALOG).

The Washington Post

The Washington Post, "Undone Deal on Uranium," Mathews, Jessica, June 19, 1995, p. A19, (DIALOG).

World News Connection

Moscow *Rossiyskaya Gazeta* in Russian, 28 December 1994, First Edition, p. 3; JPRS-TAC-95-001, "Nuclear Oversight Flaws Show Need for New Laws," (World News Connection).

Moscow *Delovoy Mir Supplement Pravo I Ekonomika* in Russian, 22 February 1995, n. 7, p. 3/11; JPRS-TAC-95-012-L, "Decree on Control System for Nuclear Materials," (World News Connection).

Moscow *Yadernyy Control: Obozreniye Po Problemam Oruzhiya Massovaogo Unichtozheniya V Rossii I Novykh Nezavisimyykh Gosudarstvakh* in Russian, n. 2, February 1995, [signed to press 30 January 1995] p. 9-11; FBIS-SOV-95-046-S, "Minister Mikhaylov on Safeguarding of Nuclear Materials," 9 March 1995, (World News Connection).

Madrid *ABC* in Spanish, 17 April 1995, p. 30; FBIS-SOV-95-014-L, "Iran Nuclear Pullout Would Be 'Disgrace'--Mikhaylov: U.S. Plays 'Double Game'," (World News Connection).

Moscow *Rossiyskaya Gazeta* First Edition, 1 June 1995, p. 7; FBIS-SOV-95-106, "Nuclear Minister Accuses U.S. of 'Strong-Arm Pressure,'" (World News Connection).

Moscow *Kuranty* in Russian, 15 August 1995, p. 4; FBIS-SOV-95-158, "Yeltsin Seen Yielding to Grachev on Nuclear Safety," (World News Connection).

Moscow *Informatsionnoye Agentstvo Ekho Moskvy* in Russian, 1230 GMT, 28 August 1995; FBIS-SOV-95-167, "Moscow Denies Secret Nuclear Deals With Iran--'No Secret Agreements Whatsoever'," (World News Connection).

Moscow *ITAR-TASS* in English, 1624 GMT, 26 March 1996; FBIS-TAC-95-005, "Minister Warns of Arms Accord Revisions If NATO Expands," (World News Connection).

Moscow *Izvestiya* in Russian, 18 April 1996, p. 3; FBIS-SOV-96-076, "'Experts' Cited on Issues at Nuclear Summit," (World News Connection).

Moscow *Yadernyy Kontrol: Obozreniye Po Problemam Oruzhiya Massovogo Unichtozheniya V Rossii I Novykh Nezavisimyykh Gosudarstvakh* in Russian, May 1996, n. 17, p. 18-19; FBIS-UST-96-023, "Nuclear Security and Gosatomnadzor," 24 June 1996, (World News Connection).

Moscow *ITAR-TASS* in English, 1113 GMT, 17 July 1996; FBIS-SOV-96-139, "Mikhaylov on U.S. Non-mention of Russia-Iran Nuclear Deal," (World News Connection).

Documents

Treaty on the Non-Proliferation of Nuclear Weapons (1968), Article IV (2), UNTS No. 10485, vol. 729, p. 169-175.