

**STRATEGY
RESEARCH
PROJECT**

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**OBSTACLES TO ENGAGING RUSSIA'S
MILITARY-INDUSTRIAL-ACADEMIC COMMUNITY**

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BY

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USAWC STRATEGY RESEARCH PROJECT

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ABSTRACT

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This study describes the obstacles to the United States' (U.S.) engagement of Russia's military-industrial-academic community in some form of military-technological cooperation. It argues that obstacles remain because no explicit legal or regulatory umbrella exists under which bureaucrats in each country may conduct business to resolve legitimate concerns (such as protection of intellectual property and release of information to third parties). The paper concludes by outlining three policy options. It recommends a U.S. policy towards Russia on military-technological cooperation.

Introduction

This paper describes the efforts of a four-man team, lead by the author, that had the mission to "Figure out how to properly conduct business, government-to-government, on military-technological cooperation between the U.S. Army and the Russian Ministry of Defense."¹ The team made four trips to Russia (primarily to Moscow and St. Petersburg) and met with dozens of Russian Government, military, industry, and academic officials in 1994 and 1995. The team coordinated its efforts with the U.S. Army Staff and the Department of the Army Secretariat (primarily through the Assistant Secretary for Research, Development and Acquisition), and the Office of the Secretary of Defense (Director, Research and Engineering). I am using this Strategic Research Project at the U.S. Army War College to share the insights the team gained and to consolidate these first hand experiences.²

Overview

This study describes the obstacles to the United States' (U.S.) engagement of Russia's military-industrial-academic community in some form of military-technological cooperation.³ After evaluating current U.S. policy and identifying obstacles from both U.S. and Russian viewpoints, the paper concludes by outlining three policy options, with a recommendation on what the United States' policy should be towards Russia on military-technological cooperation.

No official U.S. policy exists on military-technological

cooperation between the U.S. and Russia. Evolving discussions and agreements based on the Gore-Chernomyrdin talks as well as spin-offs from the Nunn-Lugar Act characterize current policy.

Obstacles to implementing military technological cooperation between the U.S. and Russia have arisen primarily because no implementing guidance exists either in the United States or in Russia. Consequently, no explicit legal nor regulatory umbrellas have been adopted under which bureaucrats in either country may conduct business to resolve legitimate concerns (such as protection of intellectual property and release of information to third parties).

To develop an effective policy, we need to initiate a more systematic approach to the issue: a Memorandum of Understanding (MOU) between the U.S. Department of Defense (DoD) and the Russian Ministry of Defense (MOD). A DOD-MOD MOU will provide the framework (the policy and implementing regulations) so that each nation's military services, commercial industry, and academia can begin to operate under an acceptable legal umbrella.⁴

WHERE WE'RE AT

Analysis of the current National Security Strategy (NSS) and Military Strategy (NMS) reveals no policy on military-technological cooperation between the U.S. and Russia. But does the NSS and NMS offer implied guidance under which the armed forces should operate in the area of military-technological cooperation?

The NSS contains broad headings outlining policy to engage

Russia and other countries (Commonwealth of Independent States, China, as well as such South American countries as Argentina, Brazil and Chile) in deterring the use of weapons of mass destruction (WMD) and preventing WMD proliferation.

Implementing credible arms control depends on knowledge:

Arms control can help reduce incentives to initiate attack; enhance predictability regarding the size and structure of forces, thus reducing fear of aggressive intent; reduce the size of a national defense industry establishments and thus permit the growth of more vital, nonmilitary industries; **ensure confidence in compliance through effective monitoring and verification;** (emphasis author's) and, ultimately, contribute to a more stable and calculable balance of power.⁵

Recognizing that this kind of knowledge is crucial to effective arms control, the NSS endorses strong intelligence capabilities. However, the most cost effective method of securing a credible, constantly updated data base upon which policy analysts and decision makers rely is economic partnership. When Russia builds a thriving, free-market economy, it may eventually pose no more arms proliferation threat than, say, France does today.

The intelligence community collects information primarily to protect national security and to identify opportunities for advancing U.S. interests.⁶ Companies in a free market economy collect information to protect their owners (shareholders) and to identify opportunities for further growth and profitability, and, most important, understanding the strengths and weaknesses of the competition.⁷ Consequently, companies in a free market economy perform similar functions as governmental intelligence organizations --each seeking economic security and opportunity

for growth.⁸

Information exchange provides mutually advantageous opportunities for both Russia and the United States at the governmental level and in commercial industry. By encouraging mutually beneficial dialogue between Russian and United States governmental officials and supporting a U.S.-Russian industrial dialogue, the information exchange contributes to a more stable and calculable balance of power.

The constant quest for information throughout the world is further illustrated in the NSS suggestion for enhancing American competitiveness: The U.S. must continue

investing in science and technology; assisting defense conversion; improving information networks and other vital infrastructure; and improving education and training programs for America's workforce. We are structuring our defense R&D effort to place greater emphasis on dual-use technologies that can enhance competitiveness and meet pressing military needs. We are also reforming the defense acquisition system so that we can develop and procure weapons and materiel more efficiently.⁹

All these examples speak to engagement of others. We want proper shortcuts and we want to save money through lessons learned, whether in the commercial area or in the defense arena. The National Security Strategy recognizes the linkage of these transnational issues -- advancing technology, military superiority, and economic prosperity -- and the necessity for our active global participation to accomplish the NSS's articulated objectives: "Enhancing Our Security...Promoting Prosperity at Home...(and) Promoting Democracy."¹⁰

Closely following the NSS, the NMS describes the Armed

Forces' role in advancing U.S. national interests. In his cover letter introducing the NMS, The Chairman of the Joint Chiefs of Staff emphasizes using the full spectrum capabilities of our Armed Forces to meet the President's NSS.¹¹ However, in this era of reduced resources, we are increasingly challenged to select the right capability for the right challenge to advance U.S. national interest in peacetime.

Concerning military-technological cooperation, the NMS contains a few paragraphs supporting military-to-military contacts and advocating selective use of security assistance programs to enhance interoperability and increase regional stability. It cites the necessity for broadening arms control and developing confidence-building measures to foster openness and transparency in military affairs, to include information exchanges.¹²

The reduced modernization program reflects the current drawdown in U.S. forces: "We intend to remain the best-equipped force in the world...we are consciously retiring certain weapons systems and platforms...(but) major modernization programs...are being undertaken only where there is clearly a substantial payoff."¹³ We are, in effect, surviving on past Cold War investments and accepting a security risk because of a constrained budget. The NMS implies, without explicitly addressing the issue, that we will accept some national security risks during this modernization hiatus.

The National Security Science and Technology Strategy

(September 19, 1995) sets forth the U.S. science and technology strategy. It highlights the inter-relationships of the military-industrial-academic community and notes international cooperation in defense technology. The strategy sagely points out that the U.S. must strike a proper balance between sharing and protecting our technology and protecting it so that the benefits outweigh the risks taken. We have mechanisms that can balance the risk and benefits for cooperative Research and Development (R&D). However, we have no implementing agreement or mechanisms for military-technological cooperation with Russia.¹⁴

Within the U.S. Army, The Army Plan for FY 1998-2013 cites a forthcoming document, The Army International Activities Plan (AIAP) 1997-2002, which will contain "specific guidance for programs and priorities." The Army Plan also endorses the concept of "military-technological activities, like international cooperation agreements."¹⁵ Yet with respect to Russia, neither the Office of the Secretary of Defense (OSD) nor the U.S. Army has reached any kind of overarching umbrella agreement on military-technological cooperation.

The Gore-Chernomyrdin Commission established the current state of technological cooperation with Russia.¹⁶ This Commission advocates a bilateral approach to structuring technological cooperation between the U.S. and Russia. Direct bilateral talks represent a change from Cold War and post Cold War U.S. efforts to change Russian (Soviet) behavior through the now defunct Coordinating Committee on Multilateral Export

Controls (COCOM).¹⁷ The revised COCOM concept which now includes Russia as a player, highlights the new approach of developing controls to control technology proliferation.¹⁸

The approach of cooperation through the Gore-Chernomyrdin Commission and the revised COCOM concept represents both ends of the spectrum: It supports assisting the modernization of Russia (and the former Soviet republics), while at the same time it keeps tight control of those critical technologies which have the potential to negate or severely challenge areas of U.S. military superiority.¹⁹

Given the U.S. military performance in Desert Shield/Storm, Russia's military downsizing, and the eagerness with which the Former Soviet Union (FSU) countries are pursuing the Partnership for Peace program,²⁰ there appears to be no immediate conventional military threat to the U.S. from Russia.²¹ Although some potent strategic FSU nuclear forces remain intact, the U.S. currently appears to be accepting minimal military risk even with no military-technological cooperation with Russia.

However, since weapons systems typically require 10 to 20 years from conception to fielding, freezing investment in modernization now could eventually cost us American lives and weaken our national security. We cannot expect a 10-year hiatus on modernization to be overcome by the typical American approach of quickly pouring in money to leap-frog over our short-term neglect. We must address the issue now.

In summary, what emerges from the NSS, the NMS, the National

Security Science and Technology Strategy, the Gore-Chernomyrdin Commission, the Nunn-Lugar Act, and the Army Plan are firm indications that engagement is ultimately dependent upon information exchange. This dialogue contributes to an emerging Russian free-market economy and a stable balance of power. So we must locate or develop a forum where former adversaries (U.S. and Russia) can exchange information while concurrently addressing mutual concerns. While The Army Plan mentions the desirability of conducting military-technological activities, there is no implementing policy or specific guidance to promote such activities.

U.S. Obstacles

The U.S. is obviously not accustomed to cooperating with Russia. So we must overcome obstacles created by past attitudes, behavior, and policy:

- ▶ The U.S. Government and industry are accustomed to exploiting Soviet weaknesses; now they must strengthen those weaknesses and acknowledge previously ignored strengths.

- ▶ The U.S. has only minimally understood and appreciated Russian culture; now the U.S. must comprehend and value Russian ideals and capabilities, as well as her persistence and enormous suffering in this century.

- ▶ The U.S. has been mostly contemptuous of the old Soviet bureaucracy; now the U.S. must attempt to energize this bureaucracy to play a key role in a new era of sharing.

Russian bureaucrats perceive previous actions by the U.S.

Government and U.S. industry as intent upon pillaging and stealing Russian technologies. Russians believe the U.S. tried to steal their technologies for our own military or economic use, thereby weakening Russia's military and economic security. It is a common feeling among MOD officers that the current U.S. intent is to prevent Russia from ever gaining economic independence or regaining military superpower status.²²

The U.S. Government's 1992 "Golden Nugget" program fostered this kind of distrust. United States scientists and engineers were encouraged to seek out and "mine the golden nuggets" of advanced technology from the FSU countries. However, the Golden Nugget program was designed to "prevent the diversion of weapons-related scientific expertise of the FSU to terrorist groups or third world countries; assist the establishment of a market economy in the independent states of the FSU by promoting, identifying and partially funding joint research, development and demonstration ventures between the US business, scientists, engineers, and entrepreneurs in those nine states."²³

However, OSD never provided any funding for this program. While this program may have yielded potential benefits, it sent the signal that the U.S. capitalists were only going in to gut FSU technologies. While OSD hesitated, individual scientists from the services, laboratories, and DoD agencies descended upon Russian industry and academia looking for advanced technologies without a coherent or integrated business plan. The U.S. Army laboratories and Program Executive Offices used their own funds

for these projects, which resulted in roughly 30 projects (loosely coordinated, and in some cases duplicative) totaling \$3.5 million between 1992 and 1994.²⁴

As the Russian Ministry of Defense became aware of these individual projects, it methodically shut them down. While some products were delivered in accordance with the signed contracts, it appears very little, if any first class original research resulted from this \$3.5 million investment. The MOD remains consistent in insisting that a DOD-MOD MOU be in place before any military research and development can be approved.²⁵

The U.S. industry (along with the rest of western Europe and Japan) also swooped into Russia seeking business opportunities (see Table 1).²⁶

COUNTRIES	Number of Joint Ventures with Russia	Total Authorized Capital (millions of Rubles)
France	90	500
Germany	373	781
United Kingdom	122	228
Italy	198	1037
Japan	43	138
Canada	71	328
United States	398	11034

Table 1 (as of 1992)

The U.S. businesses were certainly interested in making money. Their first concern was not simply to establish a long-term business relationship. Short term profits were the norm while establishing long term business relationships were the

exception. Usually only large, well established companies could afford to make the long term investments in time, money, and personnel. The majority of businesses scanning the Russian countryside were small businesses.

Consequently, the Russians experienced many "here today, gone tomorrow" businesses--those looking only for easy bucks.²⁷ However, successful American companies (such as McDonalds, Alliant TechSystems, and SAIC) taking the long term approach also established businesses in Russia. With the U.S. government and the world's businesses (with the U.S. leading the way) descending upon Russia, it is little wonder that Russia perceived that the U.S. was not interested in Russia's long-term economic recovery. We must continue to foster long term relationships to stay militarily and economically engaged with Russia.²⁸

The second obstacle to implementing U.S. military-technological cooperation with Russia falls into the "lack of cultural understanding" category. Cultural barriers include not only our social differences but also problems in dealing with the FSU bureaucrats who still fill the government structure in the new Russia.

However, this is not a new phenomenon. More than 50 years ago, then MG John R. Deane noted the same cultural challenges that Americans face in trying to interact with Russians today. Shortly after the USSR and the United States had become involved in the war, Marshall had sent MG Deane, one of his brightest young staff officers, to Moscow to supplement Ambassador Averell

Harriman's military advisers and also to act as head of the military liaison committee with the Soviets. MG Deane's job was to monitor the needs of the Red Army and, at the same time to keep Marshall in touch with Soviet plans and strategies. MG Deane noted the "importance of collaboration with Russia now and in the future. It won't be worth a hoot, however, unless it is based on mutual respect and made to work both ways. However, I feel certain that we must be tougher if we are to gain their respect and be able to work with them in the future."²⁹

Russians are noted as tough negotiators. They view time as a valuable negotiating tool, much to the chagrin of American business. Russians have suffered hardships throughout the course of the Cold War to maintain their national security. They are not about to rush into a financially profitable business relationship at the risk of losing any technological advantages they may have already earned.

Russians do not view business through the same cost-benefit lens as do Americans. If the Russians do not understand the direct business linkage to a specific benefit, then no matter how rosy the projected business prospects, they are not predisposed towards agreement. Even if the Russians are predisposed to agree, then tough Russian negotiating strategies and techniques usually frustrate the typical American government bureaucrat and/or commercial businessperson, who generally wants to wrap up an agreement very quickly.³⁰

The Russians feel no particular compunction about timely resolution of anything. Their sense of time is very different than ours. The Russians have a very interesting negotiating style. It is a combination of intimidation, obfuscation, seemingly unrelated maneuvers, blunt contradiction, seeming conciliation, and absolute assurance that they can follow the 18 threads of the negotiation more successfully than the Americans can. In most cases they are correct.³¹

Over the course of the past 70+ years, Russians have had extremely limited experience with concepts familiar to a capitalistic democracy, such as written contracts. In the FSU, agreements were based on personal relationships, face to face discussions, and handshakes. Written agreements (contracts) were treated as "suggestions" or "goals."

I encountered this "bizarre" cultural approach to contracting (by U.S. standards) consistently through dozens of interviews in Russia. Russian academicians and managers would endure an overnight 10-hour train ride from St. Petersburg to Moscow rather than discuss business over the telephone. Personal contact was paramount to getting a "feel" for how realistic or serious the author and the American team were.

Surely Russians must gain legal expertise and develop their cultural understanding of contracts. However, personal relationships will remain a key factor in dealing with the Russians. That means developing trust, which takes time. Just as successful U.S. businesses had to study, learn, and invest to crack the Japanese market, U.S. Government and industry must make a comparable effort to penetrate Russian cultural barriers and gain their trust.

The third major obstacle to implementing U.S. military-technological cooperation with Russia is simply that the U.S. government is apathetic toward such an initiative: The U.S. simply "isn't interested." Raise the question of U.S. cooperation with Russia with almost any U.S. official, and quickly you will hear: (a) What's the benefit to the U.S.? (b) Budgets are tight. Why spend money on Russia when you could spend it within the U.S. Government or with U.S. businesses? (c) A Cold War warrior mentality still pervades the U.S. defense establishment: How can we possibly help the Russians without hurting the U.S.? (d) It's too hard. A risk-adverse bureaucracy indeed throws up many roadblocks: How can we establish a dialogue with the Russians on sensitive technology, given all the security and travel restrictions? What if we are duped into sharing secrets with the Russians?

In discussing military technological cooperation, the first question that pops into everyone's mind is: What's the benefit to the United States? We want a strong, democratic, friendly Russia to provide leadership in Eurasia in the 21st century. Building a friendly Russia means engaging Russia economically as well as in military-to-military relationships. The trust that develops provides the basis for future bilateral or multilateral agreements.

Cooperation exists in some highly visible efforts in the space and aviation arenas, generated primarily through the Gore-Chernomyrdin Commission. The flight of U.S. astronauts on the

Russian Mir space station and Space Shuttle/Mir space station dockings, and the Overseas Private Investment Corporation's commitment to invest \$500 million to support defense conversion projects in Russia and FSU countries are two fairly familiar examples.³² A Congressional initiative, the Nunn-Lugar program, represents another bright spot. This program provides funding to dismantle and destroy nuclear weapons and provide peaceful alternative professional outlets for the skills and expertise of nuclear weapon scientists in the FSU. This slow-starting program appear on the verge of beginning to enjoy success and has continued support from the Russians.³³ Although technological cooperation has not served to bolster Russia's economic security, these initiatives have opened the door to further discussions.

Back in the late 1980's President Gorbachev recognized that the FSU must learn to keep pace with changing technology and speed privatization as quickly as possible. He recognized that the FSU's economic future in the post-industrial age was tied to changing from the rigidly structured and heavily subsidized military-industrial complex to a private ownership means of production.³⁴

Since Russia never had a consumer-based economy, the Russians concentrated on designing and producing military-based technologies. The investment in basic research and its subsequent military applications represent Russia's strong suit.³⁵ Russian scientists and engineers designed their combat systems under a different paradigm--one without the benefit of most U.S. advanced

technologies. Consequently, the U.S. can learn from the unique Russian approaches to technological innovations.

Encouraging the Russians to capitalize on their own research and development and on their technological resources eventually requires dialogue with Russian Government bureaucrats as well as Russian military officers. The dialogue with Russian bureaucrats and military officers concerning military-technological cooperation (and its inherent relationship with industry and academia) represents a tiny subset of the overall U.S. Government support for Russian market reforms. The NSS specifically recognizes the linkage of successful European and Commonwealth of Independent States (CIS) security with that of economic reform to free-market economies. Ultimately, the success of market reforms will depend more on trade than aid. No one nation has enough resources to markedly change the FSU's political and economic systems as we did those of other western European nations under the Marshall Plan after World War II.³⁶ Therefore, private investment represents the only viable course of engagement.

Applying major funds from the U.S. defense budgets to Russia diverts funding to support our own readiness and modernization goals. Using other government funding is inefficient as well, since it requires additional levels of bureaucratic overhead and oversight requirements to ensure we're appropriately spending our tax dollars. Therefore, it's up to U.S. business to figure out a way to make money in Russia while simultaneously providing the Russian commercial business community with an opportunity to compete.

While the Defense Department continues to deal with reduced budgets, our U.S. military bureaucracy is also a product of the Cold War. Consequently, it is difficult to convince Cold War warriors that we are not overtly helping our former enemy (and maybe future enemy in their eyes). This requires examining technologies to preclude a strictly one way flow; i.e., from the U.S. to Russia. These skeptics need to know that the U.S. has something to gain from such cooperation. It should also be emphasized that engagement does not mean acquiescing to accepting inferior technologies as a quid pro quo. Finally, the lack of interest means there is no DoD policy on military technological cooperation between the U.S. and Russia. Lack of a policy precludes bureaucrats from coherently engaging their Russian counterparts on areas of potential technological cooperation. There are no guidelines for U.S. scientists and engineers to follow when sharing technological insights. So our technocrats fear that the Russians will gain valuable U.S. technology -- potentially detrimental to U.S. military security.³⁷

Russian Obstacles

Obstacles to implementing military technological cooperation from a Russian point of view dwarf American obstacles. Russian obstacles to military-technological cooperation may be summarized as follows:

- Russia's policy on military-technological cooperation, along with implementing rules and regulations for the bureaucracy, is difficult to ascertain--perhaps totally

inaccessible.

- ▶ The mindset and culture within the Russian Governmental bureaucracy is unchanged from the Cold War.

- ▶ There is no clear resolution between the Russian MOD and Russian Academy of Sciences on protection and compensation for use of intellectual property, on protection of classified information, or on compensation for loss of funding to prevent loss of expertise to other countries.

- ▶ Russian Cold War warriors are reluctant to deal with the U.S.

- ▶ Russian tax laws are immature.

With the dissolution of the Former Soviet Union, the December 1993 ratification of a new constitution represents the first step in forming a mindset and culture of a new political economic environment, and a Russian-style capitalist democracy. Russia is in the midst of formulating the laws, rules, and regulations on which to base discussions on sensitive technologies for government, academia, and commercial business.³⁸

Consider this example of how murky the situation is in the FSU: Initially the Ministry of Foreign Economic Relations was responsible for overseeing foreign trade activities including approving relationships with foreign organizations and issuing export and import licenses. To codify the Russian Federation's policy on military-technological cooperation, President Yeltsin issued a decree on December 30, 1994, establishing the State Committee on Defense and Technical Policy (SCODTP).

This decree raised visibility and control of military technological policy oversight to the Presidential level, whereas it had been under the Export Control Commission within the Russian MOD. This is significant because previously export control of military and military-related technologies was vested within the Ministry of Defense, two layers removed from Presidential oversight--through the Prime Minister and the Minister of Defense. (See Figure 1)³⁹

In September 1995, President Yeltsin granted SCODTP authority to license defense-related exports. However, the DUMA did not agree with this change and viewed it as an added bureaucratic layer to keep people employed and give the MOD increased control of foreign contracts. Consequently the DUMA pressured President Yeltsin to sign the "Law of State Regulation of Foreign Trade Activity," which gave sole oversight authority to the Ministry of Foreign Economic Relations. But the law does not remove SCODTP. Therefore, anyone wanting to export or conduct a project related to a military activity must get two export licenses, one from SCODTP and one from the Ministry of Foreign Economic Relations.⁴⁰ Figure 1 depicts the military science and technology export approval process. However, it does not reflect any potential changes or interactions resulting from the DUMA's attempt to influence the process.

Emerging reports in April 1996 indicate that controls on the export of technology will be divided among various ministries. What has yet to emerge is the role of the Ministry of Defense.

Military Science & Technology Export Approval Process

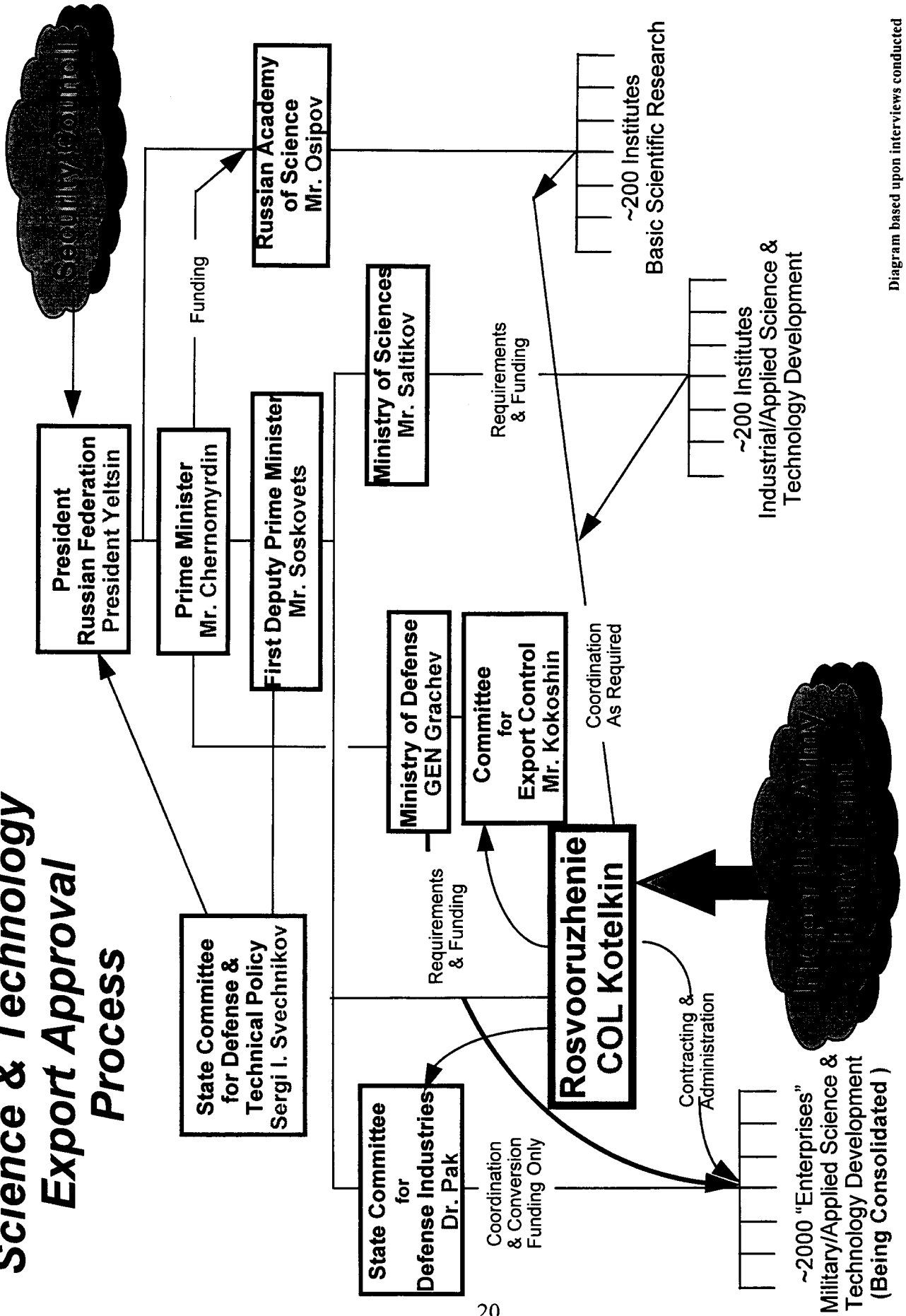


Diagram based upon interviews conducted by Messrs. Ellis, Bonnett, Irizarry, & Zacharin

Figure 1

That is, how much influence will the MOD exert? The issue to be resolved involves not only Russian national security (export of sensitive technologies), but the economic "return on investment" of technologies developed with MOD funding.⁴¹

This confusing example reveals that even the Russian bureaucracy has no clear idea on how to properly export any projects remotely related to a potential military application. This example further shows that the absence of any type of capitalistic or democratic-legal culture means that a whole government bureaucracy (and society) must be trained in how a capitalistic democracy functions and survives. Such an adaptation is especially difficult when one realizes that for the past 70 years Soviet authority was totally centralized. Everyone was reluctant to make a decision without clear top-down direction.

Even though Russia is moving through various stages of reform, the same people fill the bureaucracy who served the Former Soviet Union. This bureaucracy does not know how to let institutions operate freely. The Russian side is simply not sufficiently mature to enter into contractual dealings with the American side.⁴²

The Russian Academy of Sciences

Another obstacle is the traditional rivalry between the Russian Ministry of Defense (MOD) and the Russian Academy of Sciences (RAS). The RAS reports independently through the Russian bureaucracy (as it did in the FSU) and receives its

funding independently from the Russian MOD. However, for defense related projects, the RAS receives its funding from the MOD (see Figure 1), much like defense projects may be funded here in the U.S.⁴³

This rivalry is important because of its relation to the question of who owns the rights, patents, and royalties from technologies developed prior to the dissolution of the FSU. As expected, the MOD feels that if they funded any part of a research effort, then the MOD owns the rights/patents/royalties to that project. The RAS acknowledges this concept.⁴⁴

The RAS continues to lose its expertise because the MOD cannot afford to continue pouring money into military R&D at a pace equal to that prior to the dissolution of the FSU. Federation funding to the RAS institutes amounts to only about 10% of the budget required to maintain their personnel and facilities. Many institutes and universities are closing their doors for two or more months to reduce costs--to conserve energy and reduce salary expenses.⁴⁵

Consequently, the RAS has lost many scientists because it cannot afford to retain them.⁴⁶ Hence, the scientists have migrated to cash generating jobs or to other countries who will pay for their skills. Many Russian scientists and engineers are working in other countries, such as North Korea, China, Germany, and the United States.⁴⁷ One engineer experienced in trying to put together government to government R&D projects worried that by March 1996 there may be no one left in Russia to perform world

class science.⁴⁸

The following three examples highlight the U.S. Government's concern for preventing Russian "brain drain," which could proliferate technology and military-technology expertise:

* The START (officially the Strategic Arms Reduction Talks) treaties emphasize strategic stability, nuclear arms reductions, prevention of weapons of mass destruction, and enhanced military-to-military contact to promote understanding and increased awareness of each military's concerns. Russian "brain drain" to the wrong places could jeopardize some provisions of START.

* The Nunn-Lugar Act (officially the Soviet Nuclear Threat Reduction Act) provides financial assistance to dismantle and destroy nuclear and chemical weapons. It also provides funding to convert defense industries to civilian pursuits under principles hammered out under the Gore-Chernomyrdin Commission. The Russian "brain drain" could deprive this initiative of human resources needed for the dismantling effort.

* The Science and Technology Center: On March 3, 1994 the International Science and Technology Center opened in Moscow (through the efforts of the founding parties--the United States, the European Union, Japan, and Russia), with the expressed purpose of preventing the proliferation of technology and expertise related to weapons of mass destruction by providing peaceful employment opportunities to scientists and engineers formerly involved with such weapons and their delivery systems.⁴⁹ Obviously, the "brain drain" could foil the intent of this

initiative.

Preventing proliferation of technology and military-related expertise also involves the concept of personal responsibility to safeguard classified or sensitive information. This concept of personal responsibility with respect to handling classified information is another concept that Russian personnel working on military-related technologies must acquire. In the FSU, for all practical purposes, recorded information was considered classified unless otherwise specifically stated. Now bureaucrats scramble to find ways to market the expertise developed while working on MOD projects, while not running afoul of the Federal Counter-Intelligence Service (FSK).⁵⁰ In an attempt to prevent the disclosure of any marketable, military-related technologies, the Russian MOD (unless each case is specifically approved by the MOD), through *Rosvoorouzhenie*, censors any discussion on technologies that were developed or derived with MOD funding.

Based on many first hand interviews with Russian academics and the actions of MOD officers, I believe that most Russian scientists and engineers remain easily intimidated. They recall a "knock on the door during the middle of the night," telephone monitoring, and neighbors-spying-on-neighbors as part of the old KGB's modus operandi. Russia's instability (as it simultaneously transforms both its political and economic systems) makes scientists and engineers nervous that their country could revert to the "old ways" or even erupt into a civil war. Therefore, any discussion places scientists and engineers potentially "in

jeopardy" or "at risk," references to their personal risk of running afoul of the FSK.⁵¹

The Cold War "Warriors" and Russian Paranoia

Russia also contains its fair share of Cold War warriors. They labor under even more restrictive funding constraints than the U.S. military. Furthermore, they exhibit the paranoia of "losing" the Cold War--not through military confrontation, but due to the collapse of their economy. Therefore they are naturally reluctant to deal with their former enemies--a not unfamiliar feeling amongst U.S. Cold War warriors.⁵² This paranoia is not a new phenomenon. This aspect of Russian culture will not change quickly. The penchant for centralized control and the ensuing pathologies remain.

Just as large bureaucracies (both private and government) loathe change, Russian government bureaucrats have been slow to capitalize on technological opportunities. That is, Russian bureaucrats do not see any value in participating in technology programs that do not show a direct, short-term linkage with MOD interests. Even the highest levels do not appear to recognize or trust that scientists within the RAS institutes and universities have the ability to adapt new technologies which could economically benefit Russia.

Russian bureaucrats still want to closely monitor everything that happens. Any reference in a proposal to interfacing with Russian scientists and engineers raises a red flag. Simply by requesting interaction with Russian scientists and engineers, you

raise suspicion and, by Russian customs, exclude monitoring by the Russian Government bureaucrats. Excluding Russian Government bureaucrats from any oversight piques suspicion and therefore causes your project to be rejected. However, if one uses the term "Russian representatives," this loophole permits bureaucrats to be included in any discussions.⁵³

The organization which has been assigned the responsibility for coordinating and monitoring ventures involving military science, technology and hardware is *Rosvoorouzhenie*, the Russian Arms State Import and Export Company. *Rosvoorouzhenie* is the entry point into the complicated approval process.⁵⁴

Rosvoorouzhenie advocates that one does not enter into technical discussions with Russian Federation institutes, universities, or enterprises without first obtaining written project approval and concurrence from *Rosvoorouzhenie*. This begs the question: How can you discover areas of cooperation if you can not talk to the RAS entities where the technical expertise lies?

This paranoia continues in the provision that one does not specify the organizations with which he wishes to work. Specifying a particular institute reveals that one's interest is in the institute, not in the project itself.⁵⁵

Russia remains particularly sensitive to any suggestion that it is a second rate power. Therefore, using the tried and true sales technique of pointing out the benefits to the customer in fact antagonizes the Russian bureaucracy. One should not point

out what the merits of the project are to Russia. It is considered improper to note what Russia can do or cannot do.⁵⁶

However, RAS institutes and universities are reluctant to deal through *Rosvoorouzhenie*, because often scientists who perform the work never get paid by *Rosvoorouzhenie*. The many layers of the bureaucracy charge a "tax," so by the time the money reaches the level of the person performing the work, nothing is left.⁵⁷

The Russian Federation has methodically enforced this approach by shutting down all projects that do not receive Russian government (in the case of militarily oriented projects, the MOD) approval through *Rosvoorouzhenie*. They discover these projects when RAS enterprises and commercial businesses work through the customs and duties process to import or export materials or through the tax structure, or through travel coordination (visa applications and sponsors).⁵⁸

Contracting with Russian Federation entities is a convoluted process. This is due to complex approval procedures, tax laws, wage ceilings, and uncontrolled marketing by Russian entities not authorized to sell. Experienced U.S. companies on site in Russia take pains to find out who actually performs the work and thus to prevent a common problem, that of non-performance in compliance with the contract.⁵⁹

Properly contracting with Russian entities is further complicated by the U.S. Government taking the Russian Federation to task for failing to control the sale of Russian science,

technology, and hardware. Russia strives to balance the hard currency gains with arms sales against Russia's own security interests.⁶⁰ So MOD now actively monitors Russian entities dealing in military science, technology, and hardware. This adds numerous bureaucratic layers (and time) to the approval process.

Russian inexperience with capitalistic business practices is apparent in its internal tax structures. The tax structures are complicated and have been known to exceed 100% of the profit.⁶¹ The tax structures also influence how proposals are structured. The complicated tax structure makes it nearly impossible to understand how a proposal is structured. Therefore, understanding how to contract, quid pro quo, becomes extremely difficult if not impossible for an outsider.⁶²

WHAT'S NEEDED

In an attempt to deal with these issues, the Russian MOD has been consistent in its insistence that a MOU be negotiated between DOD and MOD. Russia has already successfully negotiated MOU's with France⁶³ and Germany.⁶⁴

The U.S. DoD and Russian MOD must compose a memorandum of understanding between the two defense departments to provide a framework which permits each country's services, commercial industry, and academia to cooperate on quasi-defense/dual-use technologies. The DoD has made overtures to the Russian MOD. However, to date, DoD-MOD discussions have made little progress.⁶⁵

What is at risk? Without an MOU, the U.S. loses any genuine

opportunity to influence and/or systematically cooperate to exploit existing Russian technology. Potential U.S. investment in technology can also provide the impetus to encourage a viable relationship between the Russian Academy of Sciences and Russian Ministry of Defense. Investment would provide both countries with an agreement that codifies a framework to mitigate Russian paranoia that cooperation between the U.S. and Russia places Russian security at risk.⁶⁶

Summary

No stated policy exists on military technological cooperation between the U.S. and Russia. Evolving discussions and agreements from the Gore-Chernomyrdin Commission and spinoffs from the Nunn-Lugar Act characterize the current status on government-to-government technological cooperation. Many DoD components and commercial businesses are independently pursuing bilateral efforts with their Russian counterparts in an attempt to establish win-win situations. However, only those programs sanctioned under the Gore-Chernomyrdin Commissions/Nunn-Lugar Act "umbrella" have shown any significant success.

The Russian MOD insists on an MOU between the DoD and the Russian MOD as a condition of permitting direct DoD to MOD cooperative R&D programs to continue.

Cooperation with Russia's R&D community opens another avenue of implementing engagement as articulated in our NSS. Direct R&D contacts in Russia also support the NMS of military-to-military contacts and provides another form of forward presence via

government-to-government contacts in the Russian R&D community. Government R&D engagement promotes linkages which span the spectrum of Russian academia, the military, and industry.

Military-technological cooperation provides the leadership (policy) and the framework (rules and regulations) by which we: increase our awareness of Russian technology applications to preclude any technological breakthrough surprises which would undermine major U.S. modernization efforts, capitalize on potential dual use technologies, provide new insights to address U.S. technological and/or engineering challenges, provide US business with the government's strategic direction so they may posture themselves as Russia transforms into a consumer economy, and receive an early indicator if Russia demonstrates any hegemonic resurgence; e.g., increase in resourcing or shift in R&D priorities.

Russia most likely would insist that Russian scientists work on U.S. installations and test sites to similarly increase their awareness of U.S. technological applications to preclude a shift in the balance of power--that is to preclude negating the effectiveness of their nuclear weapons deterrent umbrella.

Lack of a stated U.S. policy deprives us of any opportunity to influence strategically Russia's military-industrial complex through their R&D community. The absence of an overarching DoD policy also prevents the services from systematically cooperating to exploit existing Russian technology while encouraging and promoting a viable relationship among Russian academia, MOD, and

the U.S.

OBJECTIVE:

Engage Russia's military-industrial complex through its research, development, and acquisition communities.

OPTIONS:

I. Follow the Gore-Chernomyrdin Commission concept: OSD negotiates each program on a case-by-case basis with the Russian MOD. Centralize all DoD program initiatives under the Director, Research and Engineering (R&E). The Secretary of Defense (SECDEF) through the Director, R&E acting as the SECDEF's executive agent, approves all major service and DoD agency programs.

II. Negotiate an umbrella MOU between DoD and MOD, under which the services and DoD agencies operate. The Director, R&E negotiates a MOU with the Russian MOD which covers government-to-government contacts on military and dual use technologies. The MOU covers:

protection of intellectual property; handling classified information; the framework with which to discuss mutually beneficial long term (production) options and access to U.S., Russian, and world markets; restrictions on release of information, technology, and hardware to third parties; and a disputes resolution framework.

To ensure a strategic direction on high payoff technologies, the Joint Requirements Oversight Council, the Defense Acquisition Board, and the Advanced Research Projects Agency provide the Director, R&E with a coordinated list of highest payoff technological applications. Each service and DoD agency

determines its own level of engagement (metrics and definition of success) with Russia's military-industrial-academic community.

Many European countries have cooperative agreements with the U.S., but one has already signed an umbrella MOU with Russia's MOD on military-technological cooperation--France.⁶⁷ On February 4, 1994 France and Russia signed an agreement on military-technical cooperation. This agreement calls for the future joint development and production of new weapons systems. It also allows French and Russian defense firms to cooperate, but the right to make final decisions on transferring military technologies or specific "items" belongs to state agencies. This agreement could serve as the model to springboard U.S. and Russian discussions on military-technological cooperation.

One may ask why other nation-states have been more successful than the U.S. in signing mutually beneficial agreements with Russia. While an in-depth analysis goes beyond the scope of this paper, one may postulate that economics and national interests form the key drivers.

Desert Shield/Storm provided a high profile confirmation of high-tech weapons systems benefits. Technology proliferation is now transnational. The post industrial downsizing of military forces means high technology systems now replace what previously was accomplished with manpower, with no loss in combat effectiveness. After the initial investment, high-tech weapons systems are ultimately cheaper than maintaining manpower over a 20-30 year life cycle. "Before long the U.S. will have a world

monopoly on the production of high tech weapons. France is obviously willing to go to great lengths to prevent this."⁶⁸

Russia also seeks to establish economic relationships that coincide with its national interests as noted by Russian Defense Minister General Pavel Grachev's comment at the signing of the military-technical agreement with France: "This is the first time such an agreement is being signed with a West European country. This is the form that cooperation should take under the Partnership for Peace program." French Minister Francois Leotard echoed a similar theme: "the time has come for Russia and France to return to the times of the Franco-Russian alliance, the 100th anniversary of which was marked last year."⁶⁹

In summary, survival in a world economy and physical security/stability on the European continent categorize why other nation-states may have been more successful than the U.S. in signing military-technological agreements with Russia. If the U.S. wishes to compete in the world economy, then the U.S. must posture itself to capitalize on Russia's pent-up demand as it transitions to a consumer economy. Given the power and educational expertise resides in Russia's military-industrial-academic community, signing a DoD-MOD MOU provides a framework for U.S. and Russian industry to work together. The U.S. also has a vital national interest in a stable and peaceful European continent, which must include a stable Russia. Pursuing a DoD-MOD MOU serves the interests of the U.S. NSS and that of the Partnership for Peace program.

III. Do nothing. Doing nothing demonstrates to the services, DoD agencies, and U.S. business that the U.S. prefers not to strategically engage Russia's R&D community. Maintaining the status quo signals the Russians that the U.S. has not changed its Cold War policy on technological cooperation and prefers to treat Russia as a junior partner. The U.S. Government in effect encourages U.S. academia and the U.S. commercial business community to use their own devices to make profitable contacts with their Russian counterparts. The U.S. Government's implied strategic direction is to make capitalism a win for the United States.

RECOMMENDATION:

Select Option II. The Director, R&E negotiates an umbrella MOU with the Russian MOD on military-technological cooperation between the U.S. and Russia. Combined with the Director's (R&E) target list of the highest payoff technological applications, this option:

provides strategic direction without assuming detailed execution oversight; provides a common policy framework for mutually beneficial military-technological cooperation for the U.S. government and the commercial business community, and the Russian Federation; and proactively engages the Russian military-industrial complex IAW the National Security Strategy, National Military Strategy, the National Security Science and Technology Strategy, and the Partnership for Peace Program.

Military to military contacts (uniformed and civilian) in research and development provide opportunities to show our Russian counterparts how military/civilian R&D cooperation contributes to a stable democracy. Given the robust military-

industrial-academic community in both countries, there exists a framework, combined with that of the Gore-Chernomyrdin Commission and the Nunn-Lugar Act, to provide a common understanding with which to increase our influence while also promoting stability in their emerging democracy and economy. An MOU between the DoD and the MOD would provide the basis for military-technological cooperation while concurrently addressing each countries' national security and economic concerns.

List of Personnel Interviewed

Unless otherwise noted, below listed personnel were interviewed in Russia.

Asovskii, Igor G., Dr., Institute for Chemical Physics (Semenov), Moscow
Atkov, Rostislav Yu., Captain (Navy), Committee for Military-Technical Policy, Russian Ministry of Defense, Moscow
Bakhmetyer, Igor I., Deputy Chairman, St. Petersburg Mayor's Office, Committee for Economics and Finance, St. Petersburg
Balojan, Babken M., Dr., Managing Director, The Centre-Technology of Energetic Condensed Systems, Moscow
Baturin, Sergey, M., Dr., Director, Institute of Chemical Physics, Chernogolovka
Borisov, A. A., Dr., Institute of Chemical Physics (Semenov), Moscow
Choumilov, Alexandre N., Colonel (Air Force), Deputy Chief of Section, Rosvoorouzhenie, Moscow
Demin, Valery N., Major General (Air Force), Military Advisor, Head of the Russian Delegation to the United Nations, New York
Denisyuk, Anatol P., Professor, Mendeleev University of Chemical Technology, Moscow
Dremin, Analoliy N., Dr., Institute of Chemical Physics, Chernogolovka
Dudyrev, Anatoly, S., Dr., Rector, St. Petersburg State Technological Institute, St. Petersburg
Ermakov, Alexander S., Dr., N.D. Zelinsky Institute of Organic Chemistry, Moscow
Filimonov, Igor A., Senior Research Fellow, SHS Research Institute for Structural Mechanics,
Fogelzand, Alexander E., Dr., Professor, Mendeleev University of Chemical Technology, Moscow
Fomenko, V.V., Expert, Russian Science Center for Applied Chemistry, St. Petersburg
Fountikov, Anatoliy, Lieutenant General-retired (Army), President, VOENTECH
Gaidukov, Yuri N., Captain (Navy), Committee for Military-Technical Policy, Russian Ministry of Defense
Georgievsky, Sergey, S., Dr., Deputy General Director, Russian Scientific Center for Applied Chemistry, St. Petersburg
Goryachev, Yuriy A., Dr., First Secretary, Permanent Mission of the Russian Federation to the U.S., New York
Ivanshchenko, V.G. Colonel, Deputy Representative of the Russian Federation Armed Forces to the United Nations, New York
Kallistov, Anatoly, Vice President, Russian Academy of Rocket and Artillery Sciences, Moscow
Kaudryashov, Vadenin, Dr., Institute of Structural Macrokinetics, Chernogolovka
Khasainov, Dr., Institute of Chemical Physics (Semenov), Moscow
Klokov, Vladilen V., Colonel-retired (KGB), Dr., Advisor to

General Director, VOENTECH, Moscow
Kondratenko, Sergey Yu., Rosvoorouzhenie, Moscow
Kondrikov, Boris, Dr., Mendeleev University of Chemical
Technology, Moscow
Koudryashov, Vadim A., Dr., Senior Researcher, SHS Research
Center, Institute for Structural Macrokinetics, Chernogolovka
Kozhukh, Michael, Dr., Mendeleev University of Chemical
Technology, Moscow
Krasnochtchekov, Jurii I., Director, Central Research Institute
for Chemistry and Mechanics, Moscow
Kuvshinov, Viacheslav M., Chief of Department GNPP "PRIBOR",
Russian Academy of Ballistics, Moscow
Lotmensev, Yu. Dr., Professor, Mendeleev University of Chemical
Technology, Moscow
Lukianov, Oleg A., Dr. N.D. Zelinsky Institute of Organic
Chemistry, Moscow
Manelis, George B., Professor, Institute of Chemical Physics,
Chernogolovka
Maximov, Igor S., Vice President, METALKHIM-PROGRESS, Moscow
Meshkov, Alexey, Chief of Laboratory, Russian Scientific Center
for Applied Chemistry, St. Petersburg
Mironov, Victor, Major General (Army), Russian Ministry of
Defense, Moscow
Mrikin, Yury A., Department Head, State Committee for Defense
Industries, Moscow
Mukasyan, Alexander S., Dr., Institute of Structural
Macrokinetics, Chernogolovka
Novozhilov, Boris V., Professor, Institute of Chemical Physics,
Moscow
Pavina, Tatyana S., Dr., Professor, N.D. Zelinsky Institute of
Organic Chemistry
Pepekin, Vitalii, Professor, Institute of Chemical Physics
(Semenov), Moscow
Pirumov, Vladimir, Admiral-retired, Chairman, Science Council,
Security Council of the Russian Federation, Moscow
Ponomarev, Vladimir V., Vice Consul, Consulate General of the
Russian Federation, New York
Poudkov, Valeriy, Chief of Department, Rosvoorouzhenie
Rodionov, Alexander A., Deputy Chairman, State Committee for
Defense Industries, Moscow
Rychkov, Valey, Deputy Chairman, Central Planning Armaments
Industry, State Committee for Defense Industries, Moscow
Serushkin, Vlaery V., Dr., Senior Researcher, D. Mendeleev
University of Chemical Technology, Moscow
Shafirovich, Eugene Ya., Dr., SHS Research Center, Institute for
Structural Macrokinetics
Shishkin, Alexander M., Dr.
Shoutov, Veniamin, Chief, International Cooperation, Russian
Scientific Center for Applied Chemistry, St. Petersburg
Sulimov, Alexy A. Dr., Institute of Chemical Physics,
Chernogolovka

Svetlov, Boris S., Dr., Mendeleev University of Chemical Technology, Moscow
Tartakovsky, V. A., Professor, Director, N.D. Zelinsky Institute of Organic Chemistry, Moscow
Tatishchev, Yury A., Deputy Manager, State Committee for Defense Industries, Moscow
Telkov, Vladimir v., Colonel (Air Force), Deputy Chief of Department, Rosvoorouzhenie, Moscow
Tselinsky, Igor V. M., Professor, Deputy Rector, St. Petersburg State Technological Institute, St. Petersburg
Vichnevski, Vladimir S., General Director and General Designer, JSC STC "AMETECH", Moscow
Vitkovsky, Evgeny N., First Vice President, METALKHIM, Moscow
Voronov, Oleg N., Deputy Chief of Administration, State Committee for Defense Industries, Moscow
Wright, A. Lawrence IV, Dr., Assistant Executive Director, SAIC, Moscow
Yudin, Alexander, Chief Planner, Foreign Economic Affairs, State Committee for Defense Industries, Moscow
Zheltov, Alexander, Project Manager, SAIC, Moscow

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- Bonnett, Peter, Electronic Mail, October 30, 1995.
- Brown, MAJ Gil, Electronic Mail, February 14, 1996.
- Choumilov, COL Alexandre, Personal Interview, October 19, 1994.
- Christopher, Warren, U.S. Department of State Dispatch, June 5, 1995, Volume 6, No. 23: p. 475-476.
- Defense 95, *Military Advantage Through Science & Technology*, Issue 6: p.2-13.

Dudyrev, Anatoly S., Dr., Rector, St. Petersburg State Technological Institute, St. Petersburg; Georgievsky, Sergey S., Dr., Deputy General Director, Russian Scientific Center for Applied Chemistry, St. Petersburg; Manelis, George B., Professor, Deputy Director, Institute of Chemical Physics, Chernogolovka; Pavina, Tatyana S., Dr. Professor, N.D. Zelinsky Institute of Organic Chemistry, Moscow; Tartakovsky, V.A. Professor, Director, N.D. Zelinsky Institute of Organic Chemistry, Moscow; Personal Interviews, October 1994 and January 1995.

Felgengauer, Pavel, Current Digest of the Post-Soviet Press, Volume 46, Issue 5, March 2, 1994.

Forester, William H. (Bud), Lieutenant General, Military Deputy to the Assistant Secretary of the Army (Research, Development and Acquisition), Guidance, May, 1994.

Hollis, Walter W., Memorandum For Record, October 18, 1995, Subject: Travel Overview for Visit to Moscow, Russia.

Information Briefing for Mr. Thomas W. Rabaut, President & Chief Executive Officer, United Defense, Limited Partnership, subject: Russian-American Liquid Propellant and Liquid Propellant Gun Initiative, by the author, March 30, 1995.

Irizarry, John, Memorandum For Record, May 27, 1994, Subject: Administrative Vehicles for Conducting Business and Funding Work With the Former Soviet Union.

Levitin, Carl, *Russian Scientists Struggle on Against Cuts in Funding*, Nature, Volume 374, April 6, 1995: p. 489.

Macilwain, Collie, *US to Use Science Links to Meet Foreign Policy Goals*, Nature, Volume 372, November 3, 1994.

Manelis, Professor George, Institute of Chemical Physics, Chernogolovka; Denisiuk, Professor Anatol, D. Mendeleev University of Chemical Technology; Luk'yanov, Professor V. A., N.D. Zelinsky Institute of Organic Chemistry; and Choumilov, COL Alexandre, Rosvoorouzhnie, Personal Interviews, January 31, 1995.

Mironov, MG Victor, Telephone Interview, June 7, 1995.

Mosley, Leonard, MARSHALL, Hero for Our Times. New York: Hearst Books, 1982.

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Pavina, Dr. Tatyana, Personal Interview, January 22, 1995.

Pirumov, Admiral Vladimir, Electronic Mail, October 30, 1995.

Rabaut, Thomas W., Personal Interview, March 30, 1995.

Shalikashvili, John M., cover letter, National Military Strategy of the United States of America, 1995.

Tarleton, Gael, Memorandum, September 2, 1994, Subject: Negotiating with the Russians.

Tartakovsky, Professor V.A., Director, N.D. Zelinsky Institute of Organic Chemistry, Personal Interview, January 25, 1995.

Telkov, COL Vladimir, Personal Interview, October 19, 1994.

The Army Plan, FY 1998-2013 (U), December 1995, Annex C.

Atkov, Navy Captain Rostislav Yu., Personal interview, January 26, 1995.

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U.S. Department of State Dispatch, April 11, 1994, Volume 5, No. 15.

U.S. Department of State Dispatch, March 6, 1995, Volume 6, No. 10: p.1.

Wright, Lawrence, Personal Interview. January 26, 1995.

ZheltoV, Alexander, Personal Interview, January 27, 1995.

ENDNOTES

1. Forester, William H. (Bud), Lieutenant General, Military Deputy to the Assistant Secretary of the Army (Research, Development and Acquisition), Guidance, May, 1994.
2. Ellis, Bernard E., Lieutenant Colonel; Bonnett, Peter; Irizarry, John; and Zacharin, Alexy comprised the team. Messrs. Bonnett, Irizarry, and Zacharin are all experienced Department of the Army civilian engineers and it also should be noted that Mr. Zacharin speaks Russian as a first language.
3. The military-industrial-academic community encompasses more than the 'military-industrial complex"--a network of a nation's military force together with all of the industries that support it--as defined by Random House Unabridged Dictionary, Second Edition, 1993, p.1220. I use military-industrial-academic community to include academia and commercial and government enterprises; e.g., research grants and contracts by which colleges and universities work on defense-related matters, non-profit research institutes, the Federally Funded Research and Development Centers, government owned and contractor operated munitions plants, as well as commercial industry as Lockheed-Martin, United Defense, Limited Partnership, and AlliedSignal.
Russian government use of the military-industrial complex encompasses a broader definition, which includes those entities which the author has included under the umbrella term "military-industrial-academic community." To preclude confusion and provide a common base, I use military-industrial-academic community.
4. Interviews and telephone conversations with MG Valery N. Demin, Military Adviser, Head of the Russian Delegation to the United Nations, Military Staff Committee during the period of 15-17 May 1995, in New York City. Telephone conversation with MG Victor Mironov, Russian Ministry of Defense on 7 June 1995, while he was attending the Defense Base Consortium Conference in San Jose, CA. MG Mironov stated that the Russian is not ready, nor is it mature yet, to have contractual dealings with the American side. He pointed out that the mistakes made by the US Army in Russia (he's referring to the team headed up by myself), especially in dealing with the institutes -- this created a big problem. MG Mironov said that somebody probably dropped the ball (he's referring to the Russian Ministry of Defense (MOD)), but this does not change the situation. Finally, he stated that the memorandum of understanding (MOU) (he's referring to draft MOU and discussions between MOD and DOD) must be in place before any further discussions in this matter can be held (at the government-to-government level on military-technological cooperation).

5. A National Security Strategy of Engagement and Enlargement, The White House, February 1995, p.14-15.
6. Ibid, p.17.
7. Rabaut, Thomas W., Personal Interview, March 30, 1995.
8. The author does not imply that commercial industry should be in the spy business.
9. Ibid, p.19.
10. Ibid, p.7.
11. Shalikashvili, John M., General, cover letter, National Military Strategy of the United States of America, 1995, U.S. government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328 (ISBN 0-16-045531-6).
12. National Military Strategy of the United States of America, 1995, U.S. government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328 (ISBN 0-16-045531-6): p.8-12.
13. Ibid, p.19.
14. Defense 95, *Military Advantage Through Science & Technology*, Issue 6: p.2-13.
15. The Army Plan, FY 1998-2013 (U), December 1995, Annex C.
16. U.S. Department of State Dispatch, December 26, 1994, Vol. 5, No. 52: p.843. Created by President Clinton and Russian President Yeltsin after their April 1993 summit meeting in Vancouver, the Commission's original mandate was to support cooperation in the areas of space, energy, and high-technology. Since then, the Commission has expanded its scope to include four additional areas of U.S.-Russian cooperation: business development, defense conversion, the environment, and health.
17. Benson, Sumner, *Will Modern Technology Remilitarize Russia?*, Orbis, Volume 39, Number 3, Summer 1995: p.403. This institution was with which the West kept militarily significant goods and technologies from the Soviet bloc during the cold war ceased to exist in March 1994.
18. U.S. Department of State Dispatch, April 11, 1994, Vol 5, No. 15: p.206.
19. Benson, Sumner, *Will Modern Technology Remilitarize Russia?*, Orbis, Volume 39, Number 3, Summer 1995: p.405.

20. Christopher, Warren, U.S. Department of State Dispatch, June 5, 1995, Volume 6, No. 23: p. 475-476. Statement at the North Atlantic Cooperation Council (NACC) Ministerial meeting, Noordwijk, the Netherlands, May 31, 1995. It is worth extracting key aspects as follows:

"Since we last met in December, allies and partners have made substantial progress in broadening and deepening the Partnership.

* Austria, Belarus, and Malta have joined, raising the number of Partners to 26.

* Four more partners--Albania, Estonia, Latvia, and Russia--have concluded Individual Partnership Programs with NATO, and several other partners are already updating previous IPPs.

* Detailed planning is well under way for our robust program of PFP activities in 1995, which includes a first-ever Partnership training exercise in the United States, involving forces from 12 partner and 3 allied states.

* NATO and 14 partners have begun participating in a PFP Defense Planning and Review Process aimed at improving transparency and interoperability.

* And NATO has approved a comprehensive PFP funding policy and taken other steps to ensure that the partnership has the resources it needs to meet its objectives.

While participation in PFP activities has been very strong, we must work to advance the political objectives of the Partnership as well. This includes ensuring democratic control of defense forces and promoting transparency in national defense planning and budgeting.

Our objective now must be to maintain the Partnership's impressive momentum and to broaden and deepen our cooperation. The development of the Partnership is a dynamic process. As partner needs and circumstances evolve, the Partnership must be adapted and upgraded accordingly. Just as NATO is adapting itself to post Cold War realities, the partnership must rise to meet new challenges."

21. Benson, Sumner, *Will Modern Technology Remilitarize Russia?*, Orbis, Volume 39, No. 3, Summer 1995: p.405.

22. Atkov, Navy CAPT Rostislav Yu., Personal Interview, January 26, 1995.

23. Irizarry, John, Memorandum For Record, May 27, 1994, Subject: Administrative Vehicles for Conducting Business and Funding Work With the Former Soviet Union.

24. Brown, Gil, MAJ, Electronic Mail, February 14, 1996.

25. Hollis, Walter W., Memorandum For Record, October 18, 1995, Subject: Travel Overview for Visit to Moscow, Russia.

26. Alam, Shahid, *Russia and Western Technology Control*, International Relations, Volume XI, No. 5, August 1993: p.487.

27. Choumilov, COL Alexandre, Personal Interview, October 19, 1994. COL Choumilov and COL Telkov noted that a Russian company VOYENTEKH, had its export license revoked and the company was disbanded as a result of the "improper" business dealings it was conducting. VOYENTEKH was a commercial company with whom the author had dealt with in an attempt to properly purchase military technology from the Russian government.

28. Telkov, COL Vladimir, Personal Interview, October 19, 1994.

29. Mosley, Leonard, MARSHALL, Hero for Our Times. New York: Hearst Books, 1982. To grasp the depth of MG Deane's insight, it's worth quoting the letter at some length.

Moscow, 2 December 1944

Dear General Marshall:

Now that I have been in Russia for some time and am qualified as an "expert," I think it might be of some interest to you to know my general reactions. They may be of value since I have served under you long enough to enable you to evaluate them. A report is always more useful if you know the reporter.

Everyone will agree on the importance of collaboration with Russia-now and in the future. It won't be worth a hoot, however, unless it is based on mutual respect and made to work both ways. I have set at innumerable Russian banquets and become gradually nauseated by Russian food, vodka and protestations of friendship. Each person high in public life proposes a toast a little sweeter than the preceding one in Soviet-British-American friendship. It is amazing that these toasts go down past the tongues in the cheeks. After the banquets we send the Soviets another thousand airplanes, and they approve a visa that has been hanging fire for months. We then scratch our heads to see what other gifts we can send, and they scratch their heads to see what else they can ask for.

This picture may be overdrawn, but not much. When the Red Army was back on its heels, it was right for us to give them all possible assistance and no questions asked. It was right to bolster their morale in every way we could. However, they are no longer back on their heels; and if there is one thing they have plenty of, it is self-confidence. The situation has changed but our policy has not. We still meet their requests to the limit of our ability, and they limit ours to the minimum that will keep us sweet.

The trouble with the Russians...was that they were just not interested in cooperation and wished to have as little to do with foreigners ("even Americans") as possible.

We never make a request or proposal to the Soviets that is

not viewed with suspicion. They simply cannot understand giving without taking, and as a result even our giving is viewed with suspicion. Gratitude cannot be banked in the Soviet Union. Each transaction is complete in itself without regard to past favors. The part of the second part is either a shrewd trader to be admired or a sucker to be despised...

Some will say the Red Army has won the war for us. I can swallow all of this but the last two words. In our dealings with the Soviet authorities, the U.S. Military Mission has made every approach that has been made. Our files are bulging with letters to the Soviets and devoid of letters from them. In short, we are in the position of being at the same time the givers and the supplicants. This is neither dignified nor healthy for U.S. prestige.

The picture is not all bad. The individual Russian is a likable person. Their racial characteristics are similar to ours. Individually I think they would be friendly if they dared to be-however, I have yet to see the inside of a Russian home. Officials dare not become too friendly to us, and others are persecuted for this offense. The Russians have done an amazing job for their own people-both in the war and in the prewar period. One cannot help but admire their war effort and the spirit with which it has been accomplished. We have few conflicting interests, and there is little reason why we should not be friendly, now and in the foreseeable future.

He believed it was necessary to revise the American attitude towards the Russians and felt it should be done on the following lines:

1. Continue to assist the Soviet Union, providing they request such assistance and we are satisfied that it contributes to winning the war.
2. Insist that they justify their needs for assistance in all cases where the need is not apparent to us. If they fail to do so, we should, in such cases, refuse assistance.
3. In all cases where our assistance does not contribute to the winning of the war, we should insist on a quid pro quo.
4. We should present proposals for collaboration that would be mutually beneficial, and then leave the next move to them.
5. When our proposals for collaboration are unanswered after a reasonable time, we should act as we think best and inform them of our action.
6. We should stop pushing ourselves on them and make the Soviet authorities come to us. We should be friendly and cooperative when they do so.

I think there is something here worth fighting for, and it is simply a question of the tactics to be employed. If the procedure I suggest above were to be followed, there would be a period in which our interests would suffer. However, I feel certain that we must be tougher if we are to gain their respect and be able to work with them in the future.

Sincerely yours,

Deane

30. Mr. Thomas W. Rabaut, President & Chief Executive Officer, United Defense, Limited Partnership, Information Briefing, Subject: Russian-American Liquid Propellant and Liquid Propellant Gun Initiative, by the author, March 30, 1995.
31. Tarleton, Gael, Memorandum, September 2, 1994, Subject: Negotiating with the Russians.
32. U.S. Department of State Dispatch, December 26, 1994, Volume 5, No. 52: p.844.
33. U.S. Department of State Dispatch, March 6, 1995, Volume 6, No. 10: p.1.
34. Aslund, Anders, *The Russian Road to the Market*, Current History, Volume 94, No. 594, October 1995: p.311-312.
35. Telkov, COL Vladimir, Personal Interview, October 19, 1994.
36. A National Security Strategy of Engagement and Enlargement, The White House, February 1995, p.27-28.
37. Pirumov, Admiral Vladimir, Electronic Mail, October 30, 1995.
38. Zheltov, Alexander, Personal interview, January 27, 1995. According to a December 30, 1994 edict signed by President Yeltsin, the Russian Ministry of Defense (MOD) has established a Special Commission for Technical Cooperation with Foreign Partners. Included within this edict are requirements that the Academy of Sciences Institutes and the Universities must now obtain authorization from MOD to discuss research and development (R&D) efforts with potential military application as well as authorization to contract. The net effect of this new edict has had a chilling effect on the institutes and universities since they are not allowed to have personal contacts with foreign business/government entities without first obtaining approval from MOD to discuss R&D that is considered Russian military science.
39. Figure derived from interviews conducted by Peter Bonnett, John Irizarry, Alexy Zacharin, and the author.
40. Irizarry, John, Electronic Mail, February 20, 1996.
41. Zheltov, Alexander, Personal Notes, April, 1996.
42. Mironov, MG Victor, Telephone Interview, June 7, 1995.

43. In the United States, there is a much looser connection between the Department of Defense and academia. There are several independent avenues through which colleges and universities may obtain funding for defense related projects. For example, at the Office of the Secretary of Defense level, the Advanced Research Projects Agency maintains close ties to academia to stay on the frontiers of break-through technologies. Each one of the uniformed services, through government laboratories, may centrally contract directly with academic institutions. And individual government laboratories, research and development centers, and weapons systems project may contract directly with colleges and universities to fill a particular need.

44. Manelis, Professor George, Institute of Chemical Physics, Chernogolovka; Denisiuk, Professor Anatol, D. Mendeleev University of Chemical Technology; Luk'yanov, Professor V. A., N.D. Zelinsky Institute of Organic Chemistry; and Choumilov, COL Alexandre, *Rosvoorouzhnie*, Personal Interviews, January 31, 1995.

45. Tartakovsky, Professor V.A., Director, N.D. Zelinsky Institute of Organic Chemistry, Personal Interview, January 25, 1995.

46. Levitin, Carl, *Russian scientists struggle on against cuts in funding*, *Nature*, Volume 374, April 6, 1995: p.489. Remarks attributed to Yuri Osipov, the president of the Russian Academy of Sciences. Osipov notes that the reduction in the number of scientists had begun to stabilize even with the cuts in government funding, as noted in the following trend:

Reduction in the number of scientists

1992	1993	1994
-4.5%	-3.6%	-1.5%

47. Dudyrev, Anatoly S., Dr., Rector, St. Petersburg State Technological Institute, St. Petersburg; Georgievsky, Sergey S., Dr., Deputy General Director, Russian Scientific Center for Applied Chemistry, St. Petersburg; Manelis, George B., Professor, Deputy Director, Institute of Chemical Physics, Chernogolovka; Pavina, Tatyana S., Dr. Professor, N.D. Zelinsky Institute of Organic Chemistry, Moscow; Tartakovsky, V.A. Professor, Director, N.D. Zelinsky Institute of Organic Chemistry, Moscow; personal interviews with the above academic leaders during October 1994 and Jan 1995 highlighted the plight of the institutions: Drastic cuts in government funding necessitated furloughs during the summer to permit scientists to harvest foodstuffs, release of scientists who subsequently migrated to other countries or took on hard cash generating jobs. For example, a biologist (husband of one of our interpreters) was making more money as our taxi

driver than he could at his institute; the floor maid in the Aerostar Hotel made more money in tips than as an academic researcher in Moscow; and Dr. Pavina's son, a student at Moscow University, made more money selling t-shirts on the street corner over the weekend than Dr. Pavina made as a preeminent researcher at Zelinsky Institute.

48. Bonnett, Peter, Electronic Mail, October 30, 1995.
49. U.S. Department of State Dispatch, Volume 5, No. 52, December 26, 1994: p.843-846 and 851-853.
50. "Alleged FSK Paper Raises 'American Spy' Alarm." Moscow Times, January 21, 1995.
51. Telkov, COL Vladimir, Personal Interview, October 19, 1994.
52. Pirumov, Admiral Vladimir S., Personal Interview, January 25, 1995.
53. Atkov, Colonel Alexandre, Personal Interview. January 26, 1995.
54. Telkov, Colonel Vladimir, Personal Interview, October 19, 1994.
55. Telkov, Colonel Vladimir, Personal Interview, January 26, 1995.
56. Zheltov, Alexander, Proposal review notes, March 1995.
57. Bakhmetyev, Igor I., Deputy Chairman, St. Petersburg Mayor's Office, Committee for Economics and Finance, Personal Interview, February 3, 1995. During discussions, it became evident that Mr. Bakhmetyev's reluctance to embrace *Rosvoorouzhenie* was based on the fact that *Rosvoorouzhenie* owes St. Petersburg some \$38M against production contracts executed and delivered since 1993.
58. Bonnett, Peter, Irizarry, John, Zacharin, Alexy, Trip Report, September 20, 1995, Subject: U.S. Army Initiatives With the Russian Academy of Science.
59. Wright, Lawrence, Personal Interview, January 26, 1995.
60. The Current Digest of the Post-Soviet Press, April 28, 1993. Volume XLV, No. 13: p.20-21. Foreign Minister Andrei Kozyrev's comments that "not only are our friendly relations with the US and Iran not at odds, they are complementary."
61. Tartakovsky, Professor V.A., Personal Interview, October 18, 1994.

62. Pavina, Dr. Tatyana, Personal Interview, January 22, 1995.
63. Felgengauer, Pavel, Current Digest of the Post-Soviet Press, Volume 46, Issue 5, March 2, 1994: p.26-27.
64. Telkov, Colonel Vladimir, Personal Interview, October 19, 1994.
65. I reviewed the draft MOU to ensure our bilateral discussions on our specific project (while in the Program Executive Office for Field Artillery Systems--investigating contracting for research on liquid propellant technology from the Russian government) supported the provisions contained in the subject document.
66. Allakhverdov, Audrey, *President's Council Lambastes Ministry, Science*, Volume 268, June 9, 1995: p.1426. The bitter struggle over control of Russian science pits the Ministry of Science and Technology Policy (controlled by the Russian Ministry of Defense) against the Russian Academy of Sciences (independent, academic policy organization of Russian science).
67. Felgengauer, Pavel, Current Digest of the Post-Soviet Press, Volume 46, Issue 5, March 2, 1994: p.26-27.
68. Ibid, p.27.
69. Felgengauer, Pavel, Current Digest of the Post-Soviet Press, Volume 46, Issue 5, March 2, 1994: p.26-27.