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The Nuclear Legacy of the Former Soviet Union: Implications for Security and Ecology

edited by
Gerd Busmann, Oliver Meier, and Otfried Nassauer

Berliner Informationszentrum für Transatlantische Sicherheit (BITS)
in cooperation with
Heinrich-Böll-Stiftung

**The Nuclear Legacy
of the Former Soviet Union :
Implications for Security
and Ecology**

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The Nuclear Legacy of the Former Soviet Union: Implications for Security and Ecology

In 1991, for the first time ever, a nuclear-weapons state dissolved. Four new nuclear powers emerged on the territory of the Former Soviet Union (FSU). As a result, unique and unprecedented security and environmental problems appeared. Even though today Russia is the only nuclear weapon state on the territory of the FSU, the Soviet nuclear legacy retains a high priority on the European security agenda.

Compared to the size of the challenges resulting from the nuclear heritage, comparatively little public and political attention has been devoted to these problems, especially in Germany. Political discussions about these matters have been mainly a bilateral US-Russian affair. Still, many problems persist. Questions are raised on the security and safety of Russian nuclear weapons, and the efficiency of Russia's nuclear command and control system is doubtful. Politicians and military experts alike reiterate the threat of theft of nuclear weapons materials or even nuclear warheads. The migration of nuclear weapons experts to threshold countries and environmental problems are considered other substantial risks that result from the huge civil and military nuclear complexes on the territory of the FSU. Downsizing these complexes and safely handling their legacy, namely the immense amounts of nuclear waste, will remain of paramount importance.

The workshop "The Nuclear Legacy of the Former Soviet Union: Implications for Security and Ecology" was organized by the Berlin Information-center for Transatlantic Security and the Heinrich-Böll-Foundation in order to raise public awareness on these problems and to start a dialogue among independent experts. Participants - international experts from politics, academia, and the media - looked at existing problems regarding security and ecology in the FSU, and proceeded to analyze the issues from a Russian as well as from an international perspective. The workshop assessed the political environment for the future role of nuclear weapons in Russian security policy. Participants discussed current military planning and the possible impact of further arms-control measures. Finally, the performance of approaches that to-date deal with the nuclear legacy of the FSU were discussed, and proposals to solve remaining problems were developed.

The workshop had the goal of asking prominent international experts about their opinion on the situation in the Former Soviet Union. Where do they see the urgent problems? What are relevant developments in security policies? What is the situation with regard to nuclear disarmament? In the first two panels, experts and insiders from the US and Russia assessed the current situation with regard to environmental and security problems. It became clear, that the situation in Russia cannot be described in simple terms. Parallel, and partly contradict for developments are characteristic for the political development in Russia during the last couple of years.

It however became clear, that some of the problems demand immediate action. This is especially true for some of the environmental problems. The situation in the Russian naval nuclear complex for example is worsening so fast that in some cases there is even no time left for in-depth analyses of possible approaches to solve these matters. Matters are more complicated with regard to current trends in Russian security policy. The views of participants differed on where Russian nuclear weapons policies are headed. While some argued that policy is still driven by political demands, others maintained that not all aspects of Russian military policy are still under central control.

How are these problems seen from within Russia and other CIS states? What is the situation in Russia? Are the existing international programs able to deal with the existing problems? What are the interests of the West? Where have international programs been successful, where have they failed? Some speakers emphasized that the Russian domestic political process cannot be analyzed in terms of Western categories. The current political situation is complicated by the fact that very few well-established mechanisms for dealing with the nuclear heritage exist. This is one of the reasons why international risk reduction programs often miss their target. In addition, there is frequently a mismatch between the demand and supply side of international assistance. International programs appear to have been most effective where there has been close cooperation with partners in the affected country and region.

What then are sensible next steps towards reducing the dangers of the nuclear heritage of the Soviet Union? Which course should the nuclear disarmament process take? Have existing approaches succeeded in the past? And most important: What lessons can be drawn from past experiences? With regard to nuclear disarmament there was disagreement whether it is more sensible to design a comprehensive approach, linking different issues or whether the best way to achieve progress is to separately negotiate different steps. Even though there was agreement that de-alerting in principle is a sensible step to take, some participants disputed that there is a real danger of an accidental launch of a nuclear weapon.

The workshop showed that a lot needs to be done to be able to deal with only the most pressing problems. The existing approaches are clearly insufficient to cope with the threats coming from the nuclear heritage. Strategies however, must change not only quantitatively but also qualitatively. Several participants emphasized that the workshop was an important first step to a better coordination of security and environmental aspects of threat reduction programs. Discussions clearly showed that environmental aspects and consequences of disarmament and arms control have to be taken better into account. Risk reduction programs also have to be tailored more closely to the needs of the affected institutions. Finally, it became clear that a future dialogue on nuclear disarmament and ecology has to be broadened to include representatives of the Southern countries as well as from civil society. Nuclear arms control and its implication for ecology can no longer be an exclusive affair of government officials from the developed world.

We hope you enjoy reading the papers of the speakers and participants as much as we did listening to the presentations and discussions during the conference.

Berlin, November 1997

Gerd Busmann, Oliver Meier, Otfried Nassauer

The Nuclear Legacy of the Former Soviet Union: Implications for Security and Ecology

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Workshop Agenda

Friday, October 17th

- 9.00 Welcome and Introduction, BITS, Berlin
- 9.15 Welcome Heinrich-Böll-Foundation
- 9.30 **The FSU Nuclear Complex: The Environmental Legacy**
- Introduction
by Kay van der Horst, Texas University, Washington DC Office
- Commentary by Prof. Vitaly Shelest, Scientific Advisor, Russian Duma, Moscow
- Naval Nuclear Complex
Commentary by Joshua Handler, Princeton University, Princeton
- 10.45 Coffee Break
- 11.15 **The Future of Russia's Nuclear Deterrent: Current Trends in Russian Policy**
- Introduction
by Dr. Alexander Nikitin, Center for Political and International Studies, Moscow
- Current Trends in Nuclear Posture,
Commentary by Dr. Igor Sutyagin, USA and Canada Institute, Moscow
- Fissile Materials,
Commentary by Dr. Götz Neuneck, Institute for Peace Research and Security
Policy, Hamburg
- 13.00 Lunch
- 14.30 **The Nuclear Legacy and Russian Politics**
- Introduction
by Prof. Vitaly Shelest, Scientific Advisor, Russian Duma, Moscow
- Russian Nuclear Politics - A View from the West
Commentary by Prof. Ulrich Albrecht, Free University Berlin
- Public Opinion and the Future of Russian Nuclear Politics
Commentary by Dr. Alexander Nikitin, Center for Political and International
Studies, Moscow
- 16.30 Coffee Break
- 17.00 **The Nuclear Legacy and the International Community**
- The US Approach

Introduction by Jo Husbands, National Academy of Sciences, Washington

European Programs

Commentary by Dr. Annette Schaper, Peace Research Institute Frankfurt

An Assessment of Existing Programs - A View from Russia

Commentary by Floriana Fossato, Radio Free Europe, Moscow

An Assessment of Existing Programs - A View from Ukraine

Commentary by Dr. Viktor Zaborsky, University of Georgia, USA

19.00 Dinner

Saturday, October 18th

9.00 The Future of Nuclear Disarmament

Introduction

by Ambassador Thomas Graham, Jr., Lawyers Alliance for World Security/Committee for National Security, Washington

START II/III & De-alerting Measures

Commentary by Nicola Butler, British American Security Information Council, Washington

Tactical Nuclear Weapons

Commentary by Oliver Meier, BITS, Berlin

An Assessment of New Proposals from a Russian View

Commentary by Dr. Igor Sutyagin, USA and Canada Institute, Moscow

10.45 Coffee Break

11.15 Cooperation in Risk Reduction - New Ideas & Alternatives

Discussion with Ambassador Thomas Graham, Jr., Lawyers Alliance for World Security/Committee for National Security, Washington; Jo Husbands, National Academy of Sciences; Dr. Igor Sutyagin, USA and Canada Institute, Moscow; Kay van der Horst, Texas University, Washington DC Office
Moderation: Otfried Nassauer, BITS, Berlin

13.00 Lunch

14.00 Departure of Participants

I. Where are we today?

Pitfalls of Operational Arms Control and Environmental Security

by Kay van der Horst

The past two decades of arms control - whether nuclear, chemical, biological or conventional - have ingrained in most of us the understanding that the priority of arms control is to eliminate weapons, and to scale down offensive and defensive capabilities. There is little doubt that this is, and should continue to be, the priority of our efforts to advance arms control. But what does arms control mean beyond dismantling weapons systems and creating safeguards for fissile and B/C (WMD) material? The legacy of arms control is also a tremendous, yet little thought-of, global environmental security risk that is only now beginning to unfold.

Bi- and Multilateral efforts have only over the course of the past three years been initiated to retroactively address the environmental legacies of past arms control agreements. Unfortunately, the complexity of initiating and implementing such clean-up programs now, have brought about a host of complex obstacles and discouraging impediments that almost rival the complexity of negotiating arms control agreements themselves. Utilizing the example of ongoing multilateral arctic military nuclear waste clean-up programs, this short concept paper will:

- a) identify the operational obstacles to successful arms control related environmental security programs; and
- b) provide potential solutions to some of the more prevalent concerns.

The end of the Cold War and the START treaties have rendered large numbers of nuclear submarines, once at the forefront of Cold War hostilities, useless. Far less drained by economic and other burdens of the Cold War arms race, the United States appears to have successfully managed, compared to its former rival the Soviet Union, the disposal and storage of these nuclear submarines and of the affluent military nuclear wastes. This incapacity is mostly due to the tremendous economic shortfalls that Russia is currently suffering. The problem is exacerbated by insufficient storage facilities for large amounts of spent nuclear fuel (SNF) and other types of liquid or solid radioactive wastes. Furthermore, a large number of submarines that have outlived their useful service life add to the number of nuclear submarines that are awaiting decommissioning.

Recently a high ranking official of the Russian Navy stated that the Northern Fleet, once the Soviet Union Navy's crown jewel, is forced to decommission 92 nuclear submarines, of which the majority are in "highly unsatisfactory condition"(70). The submarines still contain their nuclear fuel and are often undermanned. They pose a significant regional and global environmental risk.

Beyond the acute financial shortages that are an impediment to the decommissioning process, the existing severe shortage of nuclear waste storage facilities sets another, equally significant block to the successful implementation of the efficient and economic deactivation and decommissioning procedures for nuclear submarines.

Approximately 20,000 m³ solid radioactive waste (SRW) is stored at 11 different sites along the coast of the Kola Peninsula and in Severodvinsk. All the facilities are full and at a number of them highly active SRW is stored in open fields outside the storage building. The open-stored waste is not protected by any containment structures. Over 21,000 spent nuclear fuel assemblies are stored at several sites around the Kola Peninsula - equivalent to 90 nuclear reactors. The storage facilities have all exceeded their storage capacity and are in very poor condition. Due to the lack of funds that would be required to upgrade and expand these existing facilities, the Russian Navy has been forced to resort to open air storage of the SNF.

Furthermore, High Level Liquid Radioactive Waste (HLLRW) is stored at almost all of the naval bases, either in land-based tanks, or on board service ships or floating tankers. Most of the storage tanks for liquid radioactive waste are full, and a number of them are in very poor condition. In addition to the already existing liquid waste, the operational Russian nuclear submarine fleet produces several thousand m³ of HLLRW per year. The storage crisis is precipitated by the lack of appropriate treatment plants and technologies to cope with high saline nuclear submarine HLLRW.

The litany of the above described environmental risk factors is just the tip of the iceberg. Very little knowledge exists in either the US or Russian Camps on the scope of the above described land based contaminant source terms.

To mitigate potential serious impacts on regional and global environment and security by these source terms, many countries have set out to aid Russia in its crisis by assisting in the development of storage and nuclear waste management and clean-up infrastructures. However, due to the fact that the Murmansk area is a Russian national security sensitive zone that contains a significant number of high security areas, cooperation on devising clean-up programs and practical, cost effective short or long term solutions has become an arduous process. In fact, a plethora of pitfalls has stymied these arms control related clean-up programs to the level that very little progress is accomplished.

These pitfalls are representative of many cooperative threat reduction and environmental security programs between the CIS and Western countries. The following examples are only the more general and visible - standard - impediments to arms control related environmental clean-up programs. The solutions presented below are summaries of the knowledge and understanding acquired by program officers that work on arms control related environmental security issues in Russia.

I. **Impediment:** Often funds allocated for clean-up or research programs do not reach their destination. This is the result of a Russian bureaucracy that lets the funds “trickle down” to its destination. Each institution that handles the funds within Russia takes “of the top” processing fees that often exceed 20% of the original fund. If several “transmitters” are switched before the designated recipient, very little is often left to execute the task.

- **Solution:** Funding for programs should be given directly to the source. This avoids processing fees and generates the desired deliverable.
- **The Problem:** Funding for arms control related environmental clean-up programs in Russia is scarce and hard to establish. Over the past couple of years, the perception based problem of “real” and “perceived funds” has become a significant problem. Miscommunication evoked by translation or cultural or semantic gaps triggering false expectation sets, misunderstandings of the working of the other bureaucratic system, false expectations about what the other is authorized to decide and discuss, and finally “false representation” as a bargaining tactic - all these elements have significantly contributed to accelerating mistrust on both sides of the bargaining tables of different cooperative programs. This is particularly the case in some multilateral efforts where the Russian side perceived that the agreed-upon projects would be backed by financial resources, and the funds never materialized. As a consequence many Russian military officers question why they should provide their former foes with access to some of their most sensitive military sites. Suspicions also arise in many of these officers that such access concession could be a ticket for intelligence gathering purposes.

On the Western side similar, yet different, reactions have resulted in comparable frustrations about the Russian side. Such frustrations are expressed by “they never follow through”, “they always change their previous position, and nothing is constant”, “they do not want to address the real issues, so why should I fund something that is of secondary concern to our security interest, or is not technically feasible ?” Furthermore, it is often not clear for Western experts which of the Russian ministries is authorized to decide on respective issues. The ever lasting battles over decision authority between the Ministry of Energy (MINATOM), the Ministry of Defense (MoD), the Russian Navy and regional authorities provides for any Western expert the confusion of a Kafkaesk labyrinth.

Solutions: Solutions to the above mentioned impediments to environmental security cooperation can only be, and must be, established on a high intergovernmental level. Authoritative capacities on the operational level are too limited to overcome such hurdles. In the meantime, the only recipe to the success of any operation is to manage expectations carefully.

II. **Impediment:** The still existent inter-military distrust aggravates tensions, fosters suspicions and escalates smaller issues (such as under 2) into large contentions that can halt progress of any program for some time. In the Murmansk case, negotiating teams on the Russian side consist often of regional nuclear submarine fleet commanders. These are front line officers that think in a traditional political fashion leaving very little wiggle room and willingness to negotiate beyond what they have been authorized to do, and what they perceive as the true world. Similarly on the Western side, mid-level military dominates the scene with often little operational knowledge. Furthermore, many of the Western participants enter the discussion with the somewhat antagonizing attitude of "We are here to help you clean up your mess, we know better, and you better submit to our demands..." (I have recently heard a Russian refer to this as the "John Wayne attitude".) This entire dynamic gets exacerbated by Cold War "Victor" and "Looser" roles that triggers all different types of reactions and impacts on negotiations that I do not want to discuss here. Another significant problem develops if the negotiating teams consist of a different mix of ranks. If the one side does not send officers of equal rank, the other may perceive intentions as "not serious" thereby jeopardizing the negotiations.

- **Solutions:** The negotiating teams should always consist of the same officer ranks to assure the other side that the intentions are serious. Negotiations and demands should not venture beyond the agenda that was agreed upon before the meeting in order to avoid unnecessary suspicions and confusion. Western negotiating team members should be particularly sensitive to the security concerns and personal sentiments of their Russian counterparts. We need to remember that arms control related environmental risk mitigation is also in the interest of the West.

III. **Impediment:** A significant impediment to the progress of arms control environmental security management programs is the Western fear to inadvertently upgrade Russian nuclear strategic capabilities. This Western concern is, no doubt, justified. For example, expanding and upgrading the storage facilities for nuclear submarine wastes, or developing and implementing sorbent technologies for high salinity liquid radioactive waste from Russian nuclear submarines will certainly improve the operational capabilities of the Russian submarine fleet.

- **Solution:** Decisionmakers have to weigh their choices between the benefits of securing environmental safety at the risk of creating marginal upgrades to the operational capabilities of the Russian nuclear submarine fleet. Unfortunately, the diverse domestic political impacts of a pro-environment choice may be unpopular with many policymakers even today.
- **Problem:** A significant, yet unexpected, problem is the multitude of overlapping international environmental clean-up assistance programs that are funded from different countries. For example, in North West Russia the following military nuclear submarine waste management assistance programs address the same or significantly overlapping issues:

1. the European Technical Assistance to the Commonwealth of Independent States TACIS Program;
2. various nationally funded Swedish, Finnish and Norwegian programs;
3. the United States Environmental Protection Agency's Murmansk Initiative
4. the United States Defense Special Weapons Agency's Severodvinsk LRW project;
5. the trilateral Arctic Military Environmental Cooperation (AMEC) program;
6. various industry, private public partnership programs
7. others.

The effect is that funds are spend in an uncoordinated fashion, limiting the effectiveness of clean-up efforts. Furthermore, such multitude limits the ability to negotiate specific terms in the various cooperative efforts. In fact, on several occasions, inter-agency competition within one of the countries that provide assistance, has significantly damaged the success of a program.

Furthermore, other similarly significant technical and legal issues exist that have hampered the implementation of arms control related environmental security programs in Russia. They include among others:

- disagreements on technology implementation for environmental remediation and waste management;
- absence of consistent short and long term arms control related waste management strategies and objectives;
- inconsistent and costly application of various waste management technologies due to the presence of multiple uncoordinated programs;
- technology application without sufficient source-term knowledge and prior technology intercalibration;
- frequent absence of identified intellectual property rights of Russian technologies;
- disagreements on how to solve intellectual property rights of Western technology holders if a technology is integrated for waste management purposes;
- Russian taxation of Western technologies that are imported for the sole purpose of providing waste management technological capability.

Arms control related environmental clean-up efforts require coordination among the clean-up stakeholders to secure a cohesive and focused approach. Agreement to coordinate has to be created on the highest governmental levels of assistance-providing countries to maximize the impact and benefits of the efforts. Such coordination will significantly reduce costs by avoiding overlapping investments, duplication of research and organizational cost. It will also provide the political consistency and stability that is essential to successfully address such sensitive issue areas as nuclear submarine decommissioning and nuclear waste clean-up. Above described experiences

apply to almost all post arms control, cooperative threat reduction related programs between the Western countries and Russia.

In the future, arms control negotiations will need to incorporate the above experience of the most recent years in order to structure arms reductions in a safe, economically efficient and environmentally more friendly fashion. Arms control can only then be called successful if the weapons-grade material is safely stored or disposed, the weapons platforms are decommissioned and remediated, former employees of the nuclear industrial complex have found new employment and the former weapons storage and production sites are cleaned up.

Nuclear Waste Storage In Andreeva Bay

By Thomas Nilsen

The Russian Northern Fleet's main storage for nuclear waste at Kola Peninsula is leaking radioactivity. During 1997 all spent nuclear fuel which was sent to Andreeva bay, was stored in the open, without protection. The danger of increasing leakages is great.

Andreeva bay is located on the Western shore of the Litsa fjord, 45 kilometres from the Norwegian border. The base is the only operating storage for spent nuclear fuel from the Northern Fleet's nuclear powered submarines. 21,000 spent fuel elements are stored here, in three concrete tanks in very poor condition. These storage tanks have been filled to capacity since the beginning of the 90's. Up till 1996, spent fuel was shipped away from the tanks to the reprocessing plant in Mayak in Siberia. This transportation stopped totally in 1997.

Containers stored in the open, without protection

During 1997 all containers transported to Andreeva bay were stored outside, without any kind of protection. Several tens of containers with spent fuel of the type TK-11 and TK-18 are placed on the ground near the three overfilled tanks. Each container holds 35 spent fuel elements with a maximum enrichment of 40%. The unsecured storage of these containers violates Russian and international regulations for handling of nuclear waste. Experts believe that during winter, these containers will develop cracks because of ice and snow. When thawing starts in spring-time, radioactivity could leak out in the Litsa fjord.

Existing leakages of radioactivity

The expected leakage from the new containers will come in addition to already existing leakages from 32 containers which have been stored in the open for more than 30 years. These are badly affected by the harsh weather conditions. An area of close to 2 km² are already radioactively contaminated, and radioactivity is leaking to the sea.

Along a small river that runs from the old storage site for spent nuclear fuel, Russian experts have measured elevated radiation levels. Radioactively contaminated water was leaking from the old storage in the period 1982 to 1989. Radioactivity is still transported by this river to the Litsa fjord.

Danger for criticality

The three concrete tanks which store 21.000 spent nuclear fuel elements are so run down, that the stability of the contained fuel elements is endangered. The distance between elements is only 25 cm. The concrete which separates the elements has developed cracks, because of snow and ice. There exists a substantial risk for criticality (i.e. the starting of chain reactions) when several elements get too close.

October/November a critical time

The largest risk for criticality is present when the first period of freezing starts in October and November. During 1997 the Northern Fleet did not receive any money to do necessary work to prevent the risk of criticality, as they have done in earlier years.

When the first freezing-period starts this Autumn, this lack of maintenance will lead to an increased risk for pushing the elements together.

The workers disclaim responsibility

Due to arrears in payments for maintenance and even regular salaries to the workers, the Northern Fleet disclaims responsibility for future developments. Parts of the Northern Fleets Labour Union went on strike in the beginning of October in protest against the situation. They also sent a letter to President Boris Yeltsin, in which they underline that they can not bear the responsibility any more.

Denies international inspection

On several occasions, Russia has denied experts from Norway and USA thorough information on the situation in the Litsa fjord. Even the Russian civilian nuclear inspection Gosatomnadzor has been denied entry to the base. Norwegian scientists have for several years been refused to take samplings of radioactivity outside the Litsa fjord. The Bellona Report on the situation has been banned in Russia.

The Russian Naval Nuclear Complex

by Joshua Handler

1. Introduction

A host of environmental problems have come to the attention of the world since the demise of the Soviet Union. Chernobyl proved to be just a prelude to what was to come next as the veil of secrecy was slowly pulled back during the latter years of glasnost and the early days of the Russian Federation. Unfortunately, Russia discovered that massive industrial development and a massive investment in nuclear weapons has a logic and consequence of its own regardless of capitalist or communist ideology: massive environmental degradation.

Of the many environmental problems besetting the former Soviet Union, the problems created by the naval nuclear complex -- i.e. the operation and maintenance of a large fleet of nuclear-powered submarines, and some surface ships, and icebreakers -- have generated particular attention. They are one of the problems that create immediate threats for neighboring countries as well as to Russians living in and near the bases and facilities themselves. Also, the stories of the dumping of large amounts of radioactive waste in the Northern and Pacific Oceans have created a lot of international concern.

The problem has roughly three dimensions: the previous dumping of radioactive waste at sea, the shore-side naval waste problem, which is related to the decommissioning problem and; the question of accidents aboard nuclear-powered submarines. The most acute problem today is that of the decommissioned submarines and the shore-side support facilities and maintenance ships. Little thought or planning had gone into what to do with retired submarines prior to the collapse of the Soviet Union. Since 1991, a lot of thought has been devoted to this problem, but the absence of finances has meant serious environmental problems continue, and will probably continue for a decade or more to come. The Russian Navy and surrounding countries remain concerned that a major accident could ensue. This paper will overview these three questions.¹

¹ For a more comprehensive overview covering both fleets see: Joshua Handler, "Greenpeace Trip Report. Subject: Radioactive Waste Situation in the Russian Pacific Fleet, Nuclear Waste Disposal Problems, Submarine Decommissioning, Submarine Safety, and Security of Naval Fuel," (Moscow/Washington, DC: Greenpeace 27 October 1994); Joshua Handler, "Russia's Pacific Fleet -- Problems with Nuclear Waste," *Jane's Intelligence Review*, March 1995; Oleg Bukharin and Joshua Handler, "Russian Nuclear-Powered Submarine Decommissioning," *Science & Global Security*, Vol. 5, No. 2, 1995; Thomas Nilsen et al., *The Russian Northern Fleet: Sources of Radioactive Contamination*, Bellona Report Vol 2: 1996; Joshua Handler, "Russia Seeks to Refloat a Decaying Fleet," *Jane's International Defense Review*, January 1997.

2. Dumping of Radioactive Waste at Sea

In March 1993, after several years of revelations about the dumping of radioactive waste at sea, the Russian government released a White Paper describing some 30 years of the dumping of radioactive waste at sea.² The so-called Yablokov report detailed how 18 damaged naval nuclear reactors and two internal reactor screen assemblies were dumped in the seas around the Soviet Union. Sixteen reactors were dumped in the Kara Sea and 2 in the Sea of Japan. One reactor screen assembly was dumped in the Kara Sea and one off Petropavlovsk-Kamchatskii in the northern Pacific Ocean.

Thirteen of the 16 damaged reactors dumped in the Kara Sea came from nuclear-powered submarines. The other three came from the nuclear-powered icebreaker Lenin. Most alarmingly, 6 of the 13 damaged nuclear-submarine reactors in the Kara Sea still contained their nuclear fuel. And, the Kara Sea reactor screen assembly came from the ice-breaker Lenin and contained damaged nuclear fuel. The Pacific internal reactor assembly came from a submarine and did not hold any fuel.

Dumped Naval Nuclear Reactors and Screen Assemblies			
	Arctic	Pacific	Total
Reactors	16	2	18
with fuel	6	0	6
Screen Assemblies	1	1	2
with fuel	1	0	1

The original radioactive inventory from dumped reactors was estimated to be: 2.3 million curies in North and 116 curies in Pacific. In addition to the reactors, other liquid and solid radioactive waste (LRW and SRW) was dumped including an estimated total of 16,000 curies in Western Arctic and 18,600 curies in the Pacific Ocean. Subsequent reanalysis indicates some 120,000 curies are still contained in the dumped reactors as of the mid-1990s. Japan was made alarmingly aware of this dumping when Greenpeace caught a Russian naval vessel pumping 900 tons of liquid radioactive waste into the Sea of Japan in October 1993.

Several scientific expeditions to the dump areas in the Arctic found local contamination from dumped materials. But there is no evidence of migration so far. However, all dump sites were not found and fully investigated.

To insure the dumping of liquid-radioactive waste does not resume, several countries - the United States, Japan and Norway - have been assisting Russia to build equipment to process liquid radioactive waste. E.g. Japan is funding the construction of a barge for this purpose to be placed at the Zvezda shipyard at Bolshoi Kamen near Vladivostok. The US and Norway are cooperating with Russia to expand the liquid radioactive waste processing capacity of the ATOMFLOT complex. In addition, the Pacific Fleet has deployed several "Sharya" processing units which have been processing liquid radioactive waste and is making some use of the *Pinega*

² Administration of the President of the Russian Federation, Facts and Problems Related to the Dumping of Radioactive Waste in the Seas Surrounding the Territory of the Russian Federation, (Materials from a government report on the dumping of radioactive waste, commissioned by the President of the Russian Federation, 24 October 1992 Decree No. 613), Moscow, 1993.

waste processing vessel. Thus, several thousand tons of accumulated liquid radioactive waste is beginning to be processed.³

In principle, this should allow Russia to declare its adherence to the London Dumping Convention's ban on dumping of radioactive waste at sea. President Yeltsin made some comments about this at last year's April 1996 Nuclear Safety Summit in Moscow. Also according to news reports, Japanese officials were told by Russian Nuclear Energy Minister Viktor Mikhailov when he visited Japan in early April, that Moscow was likely to join the global ban later in 1997. It remains to be seen if this happens.

The outstanding issues in this area then remain the further investigation of the dumped materials to see if they can be remediated and continued cooperation with Russia to build facilities for processing liquid radioactive waste.

3. Nuclear Submarine Bases, Shipyard and Waste Storage Facilities.

As of 1997, Jane's Fighting Ships estimates the Russian Navy has 75 operational nuclear-powered submarines. These submarines are based in the Northern and Pacific Fleets split in the same fashion they were in Soviet days: approximately two-thirds in the North and one-third in the Pacific. Three nuclear cruisers are based in the Northern Fleet and one in the Pacific Fleet. One nuclear-powered communications/range vessel is also in the Pacific Fleet. All nuclear-powered icebreakers are based at Murmansk.

Russian Nuclear Powered Submarine Force (1 January 1997) ⁴			
Submarine Type	Northern Fleet	Pacific Fleet	TOTAL
SSBN	18	10	28
SSGN	7	5	12
SSN	23	12	35
TOTAL	48	27	75

³ ITAR-TASS, "Liquid radioactive waste problem solved, fleet says," 5 December 1996, [translated in BBC Summary of World Broadcasts, 13 December 1996].

⁴ Jane's Fighting Ships, 1997-1998, p. 544.

A. Northern Fleet facilities for nuclear-powered submarines include:⁵

i. Zapadnaya Litsa: Is a fjord, some 16 km deep and 1-2 km wide located approximately 60 km northwest of Murmansk. Four submarine facilities -at Nerpichya, Bolshaya Lopatka, Malaya Lopatka, and Andreeva gubas - are located here. The first three are on the east side of the fjord, the other is on the west. Zapadnaya Litsa is also known as Murmansk-150. The Russian Navy's Typhoon SSBNs are based at the Nerpichya Guba base. This base is some 10 km from the mouth of the fjord. Approximately 2 km to the northeast of Nerpichya is the Bolshaya Lopatka Guba base for general purpose nuclear-powered submarines. Another 1 km to the northeast of Bolshaya Lopatka Guba is the Malaya Lopatka Guba submarine repair facility.

On the west side of the fjord, almost directly across from the general-purpose submarine base, is Andreeva Guba. A small bay some 1 km wide and deep, it juts to the northwest off the fjord. On the waterside of a hilly point of land on its southern side is a naval facility which is the main Northern Fleet storage site for nuclear waste from submarines, including spent nuclear fuel rods.

ii. Ara Guba: Is a fjord 10 km long and 1 km wide, some 48 kilometers north-northwest of Murmansk and 16 km east of Zapadnaya Litsa, which contains an operational general purpose nuclear submarine base. Of recent note, in 1989, according to the Yablokov Report, 2,000 curies of radiation were discharged into the bay as a result of an accident on board a nuclear-powered submarine.⁶

iii. Sayda Guba: Is a small fjord which runs to the southwest just off the Barents Sea entrance to the large Kola fjord. It is some 10 km deep, with a narrow (100s m) wide entrance which opens up into a bay some 2-3 km wide. Yagelnaya Guba is a small bay located on the southern side where Sayda Guba opens and is a SSBN base. Decommissioned submarines are stored afloat at several piers next to the small dying fishing-village of Sayda-Guba located on the southeast edge of the end of the Sayda Guba fjord.

iv. Olenya Guba: Is a small fjord which also juts westward off the larger Kola fjord, some 3-4 km south of Sayda Guba. It is 6 km long and 1 km wide, and ends in a small circular basin some 2 km by 2 km, called Kut bay. The bay's entrance is some 3 km northwest of the town of Polyarny. The town of Olenya is near the entrance of Olenya Guba on the south side of the fjord. At the end of the Olenya Guba on Kut bay is the town of Olenya Guba, also known as Murmansk-60, which contains the Nerpa shipyard. The Nerpa shipyard does submarine decommissioning work.

5 See: Joshua Handler, "The Northern Fleet's Nuclear Submarine Bases," Jane's Intelligence Review, December 1993, and Bellona's The Russian Northern Fleet (also available with updates at Bellona's website). The nuclear-powered surface ships in the Northern Fleet are based at Severomorsk. They are not thought to be very operational.

6 Yablokov Report, p. 30.

v. Pala Guba: Is a fjord some 4 km long which juts to the southwest off the entrance of the Olenya Guba to the Kola fjord. It is distinguished by a narrow entrance some 2 km long and 500 meters wide which opens up on to a small rectangular bay some 2 km long and 1 km wide. At the entrance of the bay is a small island (Shalim on Russian charts) which constricts the navigational passage to some 200-300 meters. The town of Polyarny is on the east and northeast side of the bay. In the small bay at the end of Pala Guba is a substantial submarine repair facility.

vi. Murmansk: Is the largest city north of the Arctic circle, with some 500,000 inhabitants. Although primarily containing commercial ports and shipyards, at the northern end of the city is the Rosta naval shipyard which works on conventional and nuclear-powered submarines. Nuclear fuel has been offloaded from submarines at the Rosta yard and work has been done to prepare submarines for storage afloat. The work is done at Shipyard or Building No. 35, located at the northern edge of the Rosta facility, near the Atomflot complex (where the nuclear-powered icebreakers are based, and there are also nuclear waste storage ships).

vii. Gremikha: Is a town some 300 km east-southeast of Murmansk on the Kola peninsula. The Yokanga (or Iokanga) river flows into the Barents Sea at the eastern end of the town. The naval base is located on the western part of town and is sheltered on the north by the small island called Vitte on Russian maps which creates a passageway some 1 km wide. The Ostrovnoy SSBN is thought to hold mainly decommissioned submarines now.

viii. Severodvinsk: located on the White Sea near Arkangelsk, Severodvinsk contains two major shipyards for the construction, overhaul and decommissioning of nuclear powered submarines. The Sevmash yard (The Northern Machine Building Plant) is mainly a construction yard (and is the major yard for construction of submarines) but has done some decommissioning work on Alpha titanium hulled submarines. Currently construction of Oscar SSGNs and Akula SSNs is finishing here (the last may be launched in 1997). But construction has begun the first on a new class of general purpose submarines, the *Severodvinsk*, and the first of a new generation of *Borey*-class SSBNs, the *Yuriy Dolgorukiy*.⁷ However, the lack of funds probably will mean the Severodvinsk will not become operational until after 2000 and the Borey-class submarines not until the middle of the next decade if at all.

7 "First deputy defence minister on new nuclear submarine," ITAR-TASS, 2 November 1996, (translated in BBC Summary of World Broadcasts, 5 November 1996); "Yeltsin's chief of staff, Moscow mayor attend submarine ceremony," Russian Public TV, Moscow, 1500 gmt 2 November 1996, (translated in BBC Summary of World Broadcasts, 5 November 1996).

B. In the Pacific: from south to north, facilities for supporting nuclear-powered submarines in the Russian Far East are found in the Primorsky and Khabarovsk krais and on the Kamchatka peninsula. Over half are located near Vladivostok, in and around the Shkotovo region. The other set of important facilities are concentrated near Petropavlovsk.⁸

The facilities near Vladivostok include:

i. Bolshoi Kamen, a small city of some 60,000 people, located on the west side of the Shkotovo peninsula on Ussuryiskiyi, Bay some 20 miles (35 km) east of Vladivostok, contains two plants - Zvezda and Vostok - that service nuclear-powered submarines. The Zvezda shipyard is currently the most important of the two plants. It is responsible for refuelling, repairing, and scrapping decommissioned nuclear-powered submarines. Several nuclear-powered submarines have already been scrapped at the Zvezda plant, and more are being worked on.

ii. Chazhma Ship Repair Facility is located on the south side of Chazhma Bay near the settlements of Dunay (Shkotovo-22) and Temp some 30 miles (45 km) southeast of Vladivostok on the east side of the Shkotovo peninsula. Nuclear-powered submarines are refuelled and repaired at the facility. One of the Soviet Navy's worst nuclear submarine disasters occurred here, when on 10 August 1985 an Echo II SSGN's reactor exploded at the end of a refuelling operation, contaminating the surrounding land and water.⁹

iii. A Nuclear Waste Site: there is a permanent nuclear waste storage site, located at the southeastern tip of the Shkotovo peninsula on Cape Maidelya several kilometers south of Dunay. Highly-radioactive waste from nuclear-powered submarines, such as ion-resin exchanger slurries, and low-level waste are transported to the facility by sea. The spent naval reactor fuel is held here prior to shipment to Chelyabinsk in the central Urals region for reprocessing. The other materials are kept on site.

iv. Pavlovsk is a major nuclear-powered submarine base on the eastern edge of Strelok Bay some 40 miles (65 km) southeast of Vladivostok that houses ballistic missile and other nuclear-powered submarines. Most are retired now. Three seriously damaged Pacific Fleet submarines which had nuclear accidents are also kept here.

v. Vladimir Bay, some 190 miles (300 kms) east-northeast of Vladivostok, north of Olga, contains a small submarine base. The nuclear-powered submarine facility is reportedly located at the northern end of the bay, near the towns of Rakushka and Vesely Yar. The handful of nuclear submarines bases here are all now thought to be retired. In 1990, protests by local residents lead the Pacific Fleet to abandon plans to offload spent nuclear fuel from submarines in Vladimir Bay.

vi. Further north of Vladimir Bay, in the Khabarovsk Kray, the small town of **Zavety Ilyicha** on Postovaya Bay between the seaports of Vanino and Sovetskaya Gavan used to contain a small operational nuclear submarine base but now has become a holding area for decommissioned nuclear-powered submarines, as well as decommissioned conventional submarines and surface vessels.

vii. On the Kamchatka peninsula, **Rybachy** is a major nuclear submarine base located some 10 miles (15 km) southwest of Petropavlovsk across Avachinskaya Bay, on the small

8 Joshua Handler, "Russia's Pacific Fleet -- Submarine Bases and Facilities," *Jane's Intelligence Review*, April 1994.

9 A nuclear submarine related "facility" is located about 500 meters across from the ship repair facility on the north side of Chazhma bay near the settlement of Razboinik. Reactor compartments from decommissioned submarines scrapped at Bolshoi Kamen are being stored afloat here.

Krashennikova peninsula. It is on the southern edge of the peninsula, on the northern side of Krashennikova bay. SSBNs and general purpose submarines are based here.

viii. Westward across Krashennikova bay from Rybachy, is the **Gornyak** (Miner) shipyard, located between the two towns of Primorsky (Petropavlovsk-50) to the north and Primorskoe (Petropavlovsk-53) to the south. Refuellings and repairs of nuclear-powered submarines are conducted at this facility.

ix. A **nuclear waste facility** for the storage of low- and high-level nuclear waste but not spent nuclear fuel is located to the north of the shipyard near the town of Primorsky.

x. As for the two nuclear-powered surface ships in the Pacific Fleet -- the cruiser Frunze and the Kapusta class range/intelligence ship SSV-33 -- they are based in Abrek bay, a small bay at the northern end of Strelok bay, north of the Chazhma Bay Ship Repair Facility.

4. The Decommissioning and Shore-side Waste Problem

The operation of nuclear-powered submarines generates considerable amounts of nuclear waste. Liquid and solid radioactive wastes need to be removed from submarines and stored. In addition, periodically the submarine needs to be refuelled, thus spent fuel needs to be removed from the submarine and also stored. Decommissioning a nuclear submarine generates these streams of waste and in addition, the defuelled reactor compartment must be dealt with.

In Russia every step of the process is facing problems. The support complex which was already in poor shape and accident-prone during Soviet times has been particularly burdened in the last few years. Shore-side waste sites are full of low-level radioactive waste and spent fuel.¹⁰ Shipments of the spent fuel to Mayak for reprocessing have been delayed due to lack of funds and equipment.¹¹ The service ships which unload the spent fuel from submarines are also full and in poor shape (and some have suffered accidents). The shipyards where the work is done are facing financial shortages, power blackouts and strikes. There are no final land-based storage sites for decommissioned reactor compartments removed from submarines, so they are being stored afloat in bays near naval bases. Finally, contamination is widespread at waste storage sites in the North and Far East due to accidents.¹² Lower-level contamination is thought to plague virtually every support facility for the fleet. In addition, accidents on submarines have led to contamination of the surrounding area.

The massive retirement of nuclear powered submarines has further aggravated this problem. The number of nuclear-powered submarines has declined substantially since the end of the Cold War as many first and second generation nuclear powered submarines have been decommissioned.

10 E.g. As of mid-1995, the Pacific Fleet had accumulated spent nuclear fuel with activity of 4,000,000 Ci, SRW with activity of 250,000 Ci, and LRW with activity of 30 Ci; V.A.Danilian, V.L.Vysotsky, "The Safety Problems of Spent Fuel and Radioactive Waste Handling at the Russian Pacific Fleet," Proceedings of the NATO Advanced Research Workshop on Nuclear Submarine and Related Problems, Moscow, Russia, 19-22 June 1995.

11 The introduction of a new heavier transport cask, the TUK-18, and the lack of funds meant in the early to mid-1990s the shipments of spent nuclear fuel almost came to a halt. Also, the shipment of spent nuclear fuel to Mayak does not really solve any environmental problems as it only creates more storage problems in the central Urals area.

12 Both the main storage site for spent nuclear fuel in the Northern Fleet and the Pacific Fleet have suffered accidents. Spent nuclear fuel has broken and fallen into storage pools for spent nuclear fuel and the pools have leaked. See Greenpeace and Bellona reports cited above.

Also, due to lack of financing and arms control treaties, even third generation submarines are being removed from service.¹³ The Soviet Union/Russia constructed some 248 submarines by 1996 and some 150-170 have been removed from service.¹⁴ Only some third of these have had their spent fuel removed. Of the fifty or so submarines that have had their fuel removed only some 20-25 have been partially scrapped and their reactor compartments removed, sealed up, stored afloat. A particular problem is that at least one submarine in the Northern Fleet and three submarines in the Pacific Fleet were retired due to nuclear accidents. They have damaged spent fuel on board and the Russian Navy is uncertain about how to decommission them.

5. Accidents

The Cold War at sea led to some terrible nuclear accidents. Two US submarines were lost at sea. However, the Soviet Union nuclear submarine fleet suffered some even worse mishaps. Three Soviet nuclear-powered submarines have sunk. In addition, severe nuclear accidents led to the dumping of the unrepairable reactor compartments, and even one whole submarine, in the Arctic ocean. At least four nuclear submarines are awaiting decommissioning that suffered severe nuclear accidents, including the Echo II SSGN which had a reactor explode during a refuelling in 1985.

The number of accidents may be declining due to the smaller amount of submarines and smaller amount of patrols. But accidents are still occurring. Most recently, last October, one nuclear-powered submarine suffered a flooding accident near Petropavlovsk. It managed to return to port.¹⁵ Due to the poor financial state of the Navy, and the associated weakened training and logistical support system, the possibility of a serious accident involving a nuclear-powered submarine at sea remains.

13 According to one retired senior Admiral, 23 SSBNs, including 2 Typhoons, have been retired from the navy before their time in the last 5 years; L. Belyshev, Rear Admiral in retirement, candidate of technical sciences, "Ship-Building and the Development of the Navy," *Morskoy Sbornik*, No. 11, 1996, pp. 63-67

14 Valery Marinin and Alexander Pen, "Problems of Nuclear-Powered Submarines Phase-out," *Military Parade*, July/August 1997; *Jane's Fighting Ships*, 1997-1998, p. 544.

15 "Damaged Russian nuclear submarine arrives back at base," Interfax news agency, Moscow, 28 October 1996, [transcribed in BBC Summary of World Broadcasts, 30 October 1996].

Russian SSBN and SSN/SSGN Patrols per Year 1991-1996¹⁶

Patrols	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>
SSBNs	37	28	19	19	14	12
SSN/SSGNs	18	9	13	14	13	14
TOTALs	55	37	32	33	27	26

Another concern with decommissioned submarines which still have their spent fuel onboard is accidents. Naval officers fear another major accident could occur, like what transpired on 10 August 1985 when an Echo II nuclear-powered submarine reactor exploded during a refuelling at the Chazhma Bay shipyard. Another worry is that a decommissioned nuclear submarine could sink at dockside. On 29-30th May 1997, this happened when a decommissioned submarine sank at the submarine facilities in Kamchatka. Reportedly a vessel collided with the moored submarine, and it sank. The Russian Navy claimed all fuel had been offloaded from the submarine, and it posed no environmental hazard.¹⁷ However, such reports are not reassuring. Also, the storage of sealed reactor compartments along the coast is troublesome. In the Far East, the area experiences some strong natural phenomena - earthquakes, typhoons and tsunamis - all of which have the potential to wash decommissioned submarine compartments out to sea (as well as damage shore based waste storage sites.) In the North there is heavy icing and tidal flow. Also, reportedly, one defuelled compartment was briefly lost at sea during 1994-1995 while being towed from Severodvinsk to the Murmansk area.

6. Conclusion

The US and other countries' nuclear fleets also generate considerable amounts of nuclear waste. Their nuclear submarines have also suffered accidents. Finally, their continued operation on the high seas must remain the concern of anybody worried about the global commons and the safety of the world's oceans. But the Russian naval nuclear legacy poses a set of particularly acute problems.

Areas which have housed Russian nuclear submarines will suffer from a military nuclear legacy for many years to come. At current rates, it will take at least a decade or more to dismantle and scrap the decommissioned nuclear-powered submarines, as well as deal with their nuclear waste and conduct a waste clean-up.

Russia should be devoting more resources to these decommissioning and clean-up problems. Unfortunately, it is not, and moreover, as the recent scandal over the arrest of Alexander Nikitin shows, new roadblocks to solving this problem continue to appear.

Self-interest, however, suggests that surrounding nations are somewhat forced to try to work with the Russian central government and local authorities to provide assistance to address these dangerous and pressing problems. Although such assistance at times seems to be given almost as

¹⁶ US Navy, Office of Naval Intelligence, "Russian Strategic and General Purpose Nuclear Submarine Patrols, 1991-1996," letter 26 March 1997, released under the Freedom of Information Act to Center for Energy and Environmental Studies, Princeton University.

¹⁷ 3 June 1997, ITAR-TASS.

the result of blackmail, every cloud has a silver lining. Further cooperation in the region around military-environmental matters could also be a method of encouraging more general cooperation, reducing tensions, and one hopes, improve human rights.

It would be good if governments in the area, rather than arguing about the relatively small sums of money involved in military-environmental and disarmament projects, consciously thought about how to use such programs to better long-term political relations and improve the environmental situation.

Type and Location of Soviet/Russian SSBNs														
(From START MOU 1 September 1990 and 1 January 1997) ¹⁸														
	Northern Fleet Sept 90 & Jan 97								Pacific Fleet Sept 90 & Jan 97				Total	
	Nerpich'ya		Yagel'naya		Olen'ya		Ostrovnoy		Rybachiy		Pavlovskoye			
Yankee I	-	-	6	0	-	-	-	-	3	1	3	0	12	1
Yankee II	-	-	1	0	-	-	-	-	-	-	-	-	1	0
Delta I	-	-	-	2	-	-	9	3	3	2	6	5	18	12
Delta II	-	-	4	3	-	-	-	-	-	-	-	-	4	3
Delta III	-	-	3	4	2	0	-	-	9	9	-	-	14	13
Delta IV	-	-	-	7	7	0	-	-	-	-	-	-	7	7
Typhoon	6	6					-	-	-	-	-	-	6	6
Total	6	6	14	16	9	0	9	3	15	12	9	5	62	42

18 Note the Russian Navy only counts some 27 SSBNs operational, 17 in the Northern Fleet and 10 in the Pacific; Admiral A.M. Ovcharenko, "Russia's Strategic Naval Forces. Problems and Prospects," Vooruzheniye, Politika, Konversiya, No. 2 (13), 1996 pp 38-40 [translated in FBIS-UMA-96-245-S, 26 December 1996].

The Status of Special Vessels of the Pacific Fleet as of 1995

Location	Vessel	Project	Year Constructed	Load	Condition
K A M C H A T K A	PM-74	2020	1985	1,368 SFA; 220 tons of LRW	Satisfactory. 100 per cent full of SFA, 30 per cent of LRW
	PM-32 326		1966	126 SFA; 47 tons of LRW	Retired from Navy in 1994. 126 stuck SFA
	MBTN-42 1783		1963	140 tons of LRW	Retired from Navy in 1994. 20 per cent full
	TNT-23 1383A		1968	540 tons of LRW	Satisfactory. 60 per cent full
P R I M O R Y E	TNT-27	1783A	1967	900 tons of LRW	Satisfactory. 100 per cent full
	TNT-5	1783	1960	400 tons of LRW	Retired from Navy in 1992
	T/T Pinega	11510	1989	320 tons of LRW	Satisfactory. 65 per cent full
	PM-125	326M	1960	560 SFA; 108 tons of LRW	Satisfactory. 70 per cent full
	PM-133	326M	1962	560 SFA; 46 tons of LRW	Satisfactory. 30 per cent full
	PM-80	326M	1964	113 SFA; 40 tons of LRW	Retired from Navy in 1993. 113 stuck SFA

LRW = liquid radioactive waste; SFA = spent fuel assemblies

Dynamics of Spent Nuclear Fuel Arrival at and Shipment from the Pacific Fleet's Technical Bases ¹⁹					
Year	SFA Arrival	Shipment		Remainder	Accumulation
		SFA	Train Loads		
1988	352	351	6	1	--
1989	420	320	5	100	--
1990	412	256	4	156	155
1991	396	166	3	130	271
1992	356	128	2	124	400
1993	252	165	3	87	487
1994	80	0	0	80	567

Comment: the Table does not include the amount of spent nuclear fuel (598 SFA) accumulated at the technical bases before the fuel shipment to the Mayak plant.

Dynamics of Nuclear-Powered Submarine Retirement, Reactor Defuelling, and Submarine Decommissioning at the Pacific Fleet ²⁰						
Year	Retirement from the Fleet		Core Offloading		Decommissioning	
	Total	Per Year	Total	Per Year	Total	Per Year
1985	3	3	1	1	0	0
1986	4	1	3	2	0	0
1987	6	2	5	2	0	0
1988	9	3	7	2	0	0
1989	18	9	9	2	0	0
1990	29	11	13	4	0	0
1991	35	6	16	3	1	1
1992	42	7	19	3	4	3
1993	47	5	20	1	5	1
1994	51	4	22	2	8	3
1995	54	3	22	0	9	1

19 V.A.Danilian, V.L.Vysotsky, "The Safety Problems of Spent Fuel and Radioactive Waste Handling at the Russian Pacific Fleet," 19-22 June 1995.

20 *ibid.*

Location and Main Characteristics of Decommissioned Nuclear-Powered Submarines in the Pacific Fleet as of 1995 ²¹				
Location	Amount	No. of Reactors		Comment
		Defuelled	Full	
Krashennnikova Bay	14	8	6	
Postovaya Bay	3	--	3	
Pavlovsk	19	--	19	3 subs with damaged cores
Severnaya Bay	7	--	7	
Chazhma Bay	12	12	--	8 three-compartment units, defuelled
Bolshoi Kamen	6	2	4	2 three-compartment units, 1 defuelled
TOTAL	61	22	39	

21 V.A.Danilian, V.L.Vysotsky, "The Safety Problems of Spent Fuel and Radioactive Waste Handling at the Russian Pacific Fleet," 19-22 June 1995.

Where from the START ? Zigzags of Nuclear Disarmament

by Alexander I. Nikitin

In January of 1998 the START II Treaty on reduction of US and Russian strategic nuclear arsenals would be commemorating its 5th anniversary from the moment it was signed by the Presidents of two leading nuclear powers. The best 'gift' ever in this respect could be provided by the Russian Parliament if, at last, it would ratify the Treaty which otherwise risks to become obsolete without formal entering into force.

Relations between Russia and the West in the 90s are as much dominated by the ups and downs in disarmament agenda as they were dominated by the arms race two-three decades ago. If the 'human rights' and 'democratization' issues (and rhetoric) were a key to Soviet-Western debates before the collapse of the Soviet Union, now agenda of Russian-Western summits is very much disarmament centered. This is easily understandable, as far as after crisis of Communist ideology and shrinking of the Soviet geostrategic giant into fifteen economically weak states one of the biggest residual challenges which still emanate potential and real tensions in relations between Russia and the West is decaying but huge Russian nuclear heritage.

Nuclear arsenals of the USSR and the USA reached their peaks in the mid-80s. It was during the Gorbachev era in the second half of 80s that necessity of immediate steps in nuclear reductions and the goal of complete nuclear disarmament in the future were recognized and announced by Moscow. In contrast to that period current attitude towards nuclear disarmament in the Russian political circles and public opinion has significantly changed towards less enthusiastic and more reserved. On the doctrinal level this change had various manifestations.

First, Russia has withdrawn an obligation (or rather political promise) of "no first use" of nuclear weapons given in 1982 at the Second Special UN GA Session on Disarmament. That was explained in numerous comments not only as a logical element of taking deterrence strategy but also as a compensation for the weakness of conventional means of deterrence of a foreign aggression at the hands of Russia as compared to the previous conventional capabilities of undivided Soviet Army.

Secondly, given the need for nuclear deterrence, the ultimate goal of abolishing all nuclear weapons (proclaimed by late Gorbachev) has been decreased in priority and started to be seen as a very long term aim indeed. In fact B. Eltsyn as a President or his administration never listed the goal of achieving a nuclear-weapon free world among foreign policy objectives or priorities.

Changes in approach reflected in the nuclear posture were rather characteristic. **By the mid-90's the role of the nuclear forces relatively increased in political and strategic thinking in Russia** as a reaction to a drawback of the country which has occurred in the 90's. Recently issued study commissioned by the Russian parliament with certain degree of overstatement postulates: "Does Russia need nuclear forces today and in the future? There is a nation-wide consensus in answer to this question. Everybody - military specialists, academic experts, politicians - unanimously claim: Russia needs nuclear forces - today as much as in the future"

Motivations for that could be summarized in two basic groups of arguments:

Firstly, Russia appeared on the international arena much weaker militarily and strategically than the former Soviet Union due to the split of the military-industrial infrastructure (six formerly biggest and strongest military districts with all their infrastructure appeared out of the Russian territory, missile defense and air defense systems seriously undermined, navy lost important part of ship-building and servicing facilities, new borders stay in significant parts unprotected and even unmarked etc.) Under such conditions Russian military planners are trying to rely upon not only strategic deterrence but also reintroduced notion of "tactical nuclear deterrence" against regional and local non-nuclear threats.

Secondly, more broad political argument is employed: Russia being weakened not only militarily but also politically, economically and having lost its ideological leadership could support its status of a great power and "stay in the club" of international decision-makers only if it assures and stresses its nuclear status. Some tones of this arguing resembles argumentation used by France at the early stages of creation of independent nuclear capabilities.

Though there are certain voices in Russia in favor of complete elimination of nuclear weapons, in general the debates shifted from "non-nuclear future" dilemma (which already was formulated at the late 80's as a goal worth political efforts by M.Gorbachev) towards the formula "how much of disarmament wouldn't harm weakened Russia's national interests". Such an approach was summarized in analytical report commissioned by the Russian parliament in 1996 in the following form: disarmament is not necessarily a value in itself; it becomes a value if it enlarges strategic stability and/or if it serves [unilateral] national interests of the country. "It is undoubfful that disarmament negotiations as such both politically and diplomatically enhance trust among negotiating parties and are a somewhat stabilizing factor. At the same time negotiated agreements could negatively influence strategic stability... Disarmament, reduction of weapons, even a large one, shouldn't be an only objective of the agreement, especially if agreement lowers security of one of the sides."

Such statements continue to be based on the "zero-sum game" logic supposing that stability is mostly achieved through preservation of numerical balance. What though is underestimated in such statements is an additional safety which results from any diminishing of the quantity of nuclear devices able to malfunction, to get to the wrong hands or be used in a result of combinations of technical and/or human errors.

It also should be pointed out that any failure of the prolonged disarmament negotiations would by itself create distrust and mutual suspicions of the sides which also results in strategic instability which should be carefully taken into consideration against instability which might be caused by implementation of the cuts.

START II as a Hostage of Linkages

What are the basic concerns expressed and amendments proposed on the START II in Russia? These concerns could be grouped into at least three categories: related to strategic balance, related to cost and period of implementation, and related to preservation of ABM treaty.

One of the major dissatisfaction of Russian critics of the treaty proceed from the "inability to trade adequate gains" from the 'giving up' heavy multi-warhead SS-18 missiles (termination of these powerful land-based missiles was considered by the American side as one of the highest priorities throughout negotiations); SS-18s were underused as a 'bargaining chip'.

There is a visible asymmetry in scale and complexity of reductions. The US side need mainly (additionally to the START I implementation) eliminate 50 MX missiles and deactivate several dozens of heavy bombers: all other reductions are purely downloading of quantity of warheads without changing carriers and platforms and without obligations to destroy stored warheads. No build up is planned to fit into permitted configuration of the balance.

The Russian side is expected to implement physical destruction of the heavy missiles and their silos additionally to the downloading of certain types of missiles. And to fit into permitted configuration of triad the Russian side (if to follow traditional approach to balance) need to invest into building and deploying several hundreds (up to 690) of new missiles (if no new lower ceiling negotiated).

Concerns and debated suggestions of amendments and modifications of the treaty from the Russian side could be summarized as follows.

- **Reversible Strategic Potential** (rearmament potential) of the sides is to be balanced. Rearmament potentials concern deals with a possibility to reinstall for operational use of warheads which are removed but not destroyed (currently START II allows Russia to have about 650 reversible warheads, while the USA could possess as many as 4500-5000). There are different possible methods of dealing with this disbalance. One would be allow Russia to retain and download all of its SS-19 missiles. Another is undertake measures making reversibility of American Trident SLBM downloading and nuclear reorientation of conventional bombers more difficult or costly.
- **Deadline** originally set for reaching START II ceilings (2003) was hardly reliable for Russia due to budgetary and technical constraints. In spring of 1997 the deadline was agreed to be shifted to the 31 December 2007. That was a part of compromise reached by President Clinton and President Eltzy at their summit at Helsinki. This decision omits one of the most persistent arguments of the opponents of ratification of the Treaty.
- **Compliance with ABM Treaty** in narrow meaning is to be guaranteed by both sides. It is recommended to formulate at the resolution of ratification that Russia would break its participation at START II treaty if the USA would essentially violate or leave or prepare to leave the ABM treaty. By preparations to leave ABM treaty it is meant essential upgrade of financing of R&D aimed at creation of strategic missile defense systems prohibited by the treaty, as well as creation, testing or deployment of defense systems (and their components) limited by the ABM treaty.
- Again Joint Statement of March 21, 1997 by two Presidents provide some space for a compromise, though, ironically, both sides continue the statement to be a unilateral victory: Russian side reads it as a further prohibition of violations of ABM treaty while American side reads it as a permission to continue with current shape of missile defense research.

- **Methods of liquidation of warheads and silos** are economically and ecologically unfavorable to Russia and more favorable to the USA.
- It is suggested to try to modify at least procedures of destruction of silos as well as to receive technological aid in ecologically safe methods of elimination of toxic geptil fuel of solid-fueled missiles.
- **Destruction of silos** of missiles dismantled under treaty envisages sensible extra costs and in case of need of recovery new silos are too costly for current Russian economy. Critics of the Treaty propose to relax the START II limit of 90 on the number of SS-18 silos that may be converted, to allow all 154 silos left under START I to be converted for single-warheaded ICBMs.
- Russia might try to negotiate a **permission to deploy at sea at least one new type of SLBMs or deploy of newly elaborated SLBM in silos on land** (downloaded to single warhead)
- **Window of vulnerability** at the end of first 7 years long stage of reductions is foreseen by Russian strategists if MIRVed launchers would be, as required by stages scheme, cut down to 120 at most (1200 warheads) while permitted SS-25s would be produced and deployed slowly (if at all), not sufficiently to close widening gap with US.
- To avoid window of vulnerability and to be able to meet time pressure Russian side might try to **renegotiate or omit phases (stages) of reductions** within general length of treaty's implementation
- Finally, there is a political linkage between NATO enlargement (which has become inevitable after decisions of Madrid NATO summit in July 1997) and Russia's readiness to reduce armaments. Such link has not only "ideological" meaning (as one opponent of the treaty formulated it "it's stupid to disarm when another military bloc clearly approach your borders"). Some Russian strategic planners were seriously frightened by the implications for the strategic balance of the probable deployment of tactical nuclear or/and high-precision medium- and long-range conventional weapons on the territories of Poland and other new potential NATO members. Such fears were partially (though not fully) omitted as a result of signing of Russian-NATO agreement on the 27th of May, 1997.

More concerns and amendments are debated. At the same time it is clear that some of them are of different scale and importance than others. Basically, the final term of implementation is negotiable as far as Russian side is ready to the basic provisions of the Treaty. Some other concerns could be met "on the margins" without endangering the treaty as such. The only condition which could bury the treaty is clear willingness of Russian side to link START II with full compliance of sides to ABM limitations multiplied by the clear willingness of the US side to proceed with elaboration of the national missile defense system.

After all, could Russia afford to keep in the future its nuclear forces on the level which is higher than the ceiling defined by the START II ? The answer is clearly negative. Considering necessities to invest into missile defense (or counter-missile defense technologies) and necessity to cope with US superlarity in air-based component and demand for simultaneous substitution of fistically old parts of the arsenal with the new items, **combined consequential cost of measures necessary in case of non-ratification of the START II would be for Russia even higher than uneasy cost of its implementation.**

START III: a Basket Without Bottom

What is START III ? A label for yet unexisting negotiations and future Treaty between Russia and USA on the cuts of strategic nuclear weapons.

How it was initiated ? The first amorphous description of parameters for required treaty were debated by experts in 1995-1996 as a way to overcome certain dissatisfaction with parameters of START II. An official "blessing" to the process of START III was given by the Presidents of the USA and Russia in the special Joint Statement signed on March 21 1997 in Helsinki.

When it is expected to be concluded ? Somewhere between 1997 and 2007 (which is a new deadline for accomplishing the cuts envisaged by START II). But from the very beginning it is clear that START III negotiations wouldn't be short and easy. For sure they take years.

As a matter of fact START III is at present moment rather a wide "basket" for all yet unresolved issues of nuclear disarmament. It has several thematical blocks, like new lower ceilings for nuclear launchers, matters of destruction of warheads, interrelation between nuclear disarmament and development of strategic and tactical missile defense, etc. It is quite probable that after some time the "bunch" of START III negotiations would split onto two or even more new agreements, treaties each of which would have its own destiny.

Several principle agreements (or rather preliminary "mutual understandings") were laid as a foundation for the START III process.

- 1) Main driving force of the START III negotiations is a **new lower level of permitted quantity of nuclear strategic warheads**. Figures of 2000-2500 are quoted in the Joint Statement of two Presidents. At the same time some officials of Defense Committee of the Russian Duma advocate the level of 1000-1500.
- 2) START III process would include as "separate track of negotiations" **cuts of long-ranged sea-based cruise missiles** which have stayed untouched by all existing disarmament treaties. Addition of this new class of weapons to the disarmament process is an achievement by itself. But it is not occasional that these negotiations are called a "separate track". Cuts in sea-based weapons require new yet unagreed means of verification, inspections. Their storing and further destruction is not thought through or negotiated as for now. Even bigger problem could be created by the fact that cruise missiles could be easily reloaded from nuclear-warheaded to conventional warheads and reverse. Methods of counting them have a lot of "underwater stones". There is a great probability that this "separate track" would lead to a separate agreement different from START III mainframe.
- 3) Another principal "novelty" of START III would be an **inclusion into negotiations of the tactical nuclear arsenals** of the sides. Numerically tactical arsenals of the sides are by a factor larger than their strategic arsenals. And many tactical nuclear weapons of the USA and Russia are more powerful than those counted as strategic. For example, US and Russian tactical nuclear bombs reach a level of up to 250-350 Kt (compare to strategic 40 Kt "Poseidon" or 170 Kt "Muniteman-2").

Following unilateral (but parallel) initiatives of the USA and Russia announced in 1991 both sides are proceeding with TNW partial disarmament even without (or before) any formal bilateral agreement. By 1996 Russia, for example, has cuted by one-third sea-based TNW and nuclear bombs of the Naval aviation and about 50% of the TNW for the land-based tactical aviation and bombers. Cuts of tactical warheads aimed for anti-aircraft defense are also reaching around 50% of the 1991 level. That makes quite possible relatively quickly reach an agreement nailing down ceilings for TNW which are already reached or approached in course of these parallel unilateral cuts.

At the same time tasks of American and Russian TNW are very much asymmetrical because of significant differences between geopolitical location and situation of two countries. This leads to visible differences in requirements of the sides in the TNW sphere and complicates comprehensive agreement on the deep symmetrical **coordinated cuts** of tactical nukes and carriers.

- 4) START III should include a whole set of **new measures enhancing transparency** in respect to existing nuclear warheads (both active and stored) and their physical destruction. **Requirements and procedural rules for destruction of warheads** would differ START III from previous disarmament treaties which basically were aimed at cutting rather nuclear carriers and launchers than warheads themselves. This part of negotiations would be aimed first of all at providing assurance against quick rearmament of any of the sides using deactivated and stored but undestroyed warheads. As known this issue of "reversible strategic potential" or "virtual arsenal" of the sides is among main obstacles to the ratification of START II and hopefully would be taken care of within the framework of START III.
- 5) One more principal matter of START III "basket" is an issue of **upgrading already existing nuclear disarmament treaties to the status of permanent** ("eternal").
- 6) As for the inclusion into the nuclear disarmament process of other nuclear states (China, GB, France and undeclared nuclear states) it seems premature to look for **ways of their involvement** within the framework of START III process. Still the START III framework is mainly designed for the levels (counted in thousands) and types of nuclear weapons which are not characteristic for any other states but the USA and Russia. A different START IV process of negotiations on yet unelaborated principles could be a multilateral while **START III would remain a bilateral, not multilateral treaty.**

Recovery after START ?

Among directions of future talks within a START framework Presidents Clinton and Eltzy stressed at Helsinki summit a necessity to elaborate legal and technical measures and guarantees to assure **irreversibility** of already existing disarmament agreements. This is very timely and necessary direction of talks indeed. On both sides of the ocean - in the USA as well as in Russia - there are numerous voices denouncing the process of nuclear reductions as temporal and advocating preservation of abilities to reverse the tide quickly 'if national security interests would require'. In this respect an article published in periodical "Vek" (Sep.1996) by Russian Minister of Atomic Energy Victor Mikhailov and two his colleagues from Arzamas-16 Federal Nuclear Center on the matters of NATO expansion and Russian security needs is very characteristic. V. Mikhailov raises the project of a radical modernization of the Russian nuclear arsenal under the circumstances of decline of Russia's conventional defence capabilities:

"Militarily, Russia's security can only be guaranteed by nuclear deterrence policies. Giving up nuclear arms would leave Russia with no effective military potential... If the events take an unfavorable turn, Russia could rectore its arsenal of missiles which were scrapped under the 1987 medium and shorter-range elimination treaty, develop new generation battlefield nuclear arms with relatively low capacity and reduced side effects on the environment and population located outside the hostilities area..." Weapon designers and the Russian minister are quoting a figure of up to 10,000 high-safety nuclear warheads with a yield (TNT equivalent) ranging from dozens to hundred tonnes to be required under such a plan, designed for theater missile, front-line aviation, and anti-aircraft complexes. According to authors' estimates, to implement this programme, Russia would need about 300 tonnes of weapon-grade uranium and 30 tonnes of weapon grade plutonium. Authors 'optimistically' resume that these materials could be obtained from resources released in the nuclear arms dismantling process under START I and START II treaties.

Leaving aside technical aspects of such proposal, anybody could assume that stable continuation of nuclear disarmament remains at present far from irreversible both in respect of 'hardware' (removed but undestroyed warheads and fissile materials) and 'software' (status of people's minds). In the end of 90s the attitudes to nuclear disarmament in Russian political circles and in public opinion have shifted towards priorities of preservation of a strong nuclear potential in the weakened Russia. The emphasis is made onto preservation of the ABM treaty, keeping relative numerical parity with the USA on all stages of reductions, reintroduction of tactical nuclear weapons. Nuclear-weapon-free world is not anymore considered a political objective though it is still listed among long-term goals. Russia follows CTBT and NPT obligations and zigzags around START, but further progress towards nuclear disarmament seems very much dependent upon general recovery by Russian political elite and public from a syndrom of a weakened and 'defeated' nation.

Fissile Material Security and Nuclear Non-Proliferation

by Douglas Shaw

The Department of Energy has asked me to explain that the United States Government in no way confirms or endorses these remarks and that I alone am responsible for the views I am expressing here today and the accuracy of the statements I make.

There are four main points I'd like to make regarding fissile material security in Russia and the Newly Independent States. First, the possible theft or diversion of fissile material gravely threatens international security because it would constitute a considerable short-cut to proliferation or nuclear terrorism. Second, the security of fissile material in Russia and the Newly Independent States faces a variety of acute challenges. Third, efforts to improve fissile material security in Russia and the Newly Independent States have a significant impact and should be expanded. Finally, the problem of fissile material security should be viewed in the context of broader efforts to stop the spread of nuclear weapons globally.

I. Insecure Fissile Material Threatens International Security

The possibility that a terrorist organization could detonate a nuclear explosive device lies at the nexus of two of the greatest threats to international security: nuclear proliferation and terrorism. This combination is considerably more dangerous than either threat alone. Throughout the nuclear age, we have depended on deterrence for security, but a terrorist organization may not be responsible for a defined geographic territory or a civilian population against which to level a deterrent threat. At the same time, a single, primitive nuclear explosive could give such an undeterrable group the power to cause hundreds of thousands of deaths. The civilized world has no higher security priority than preventing terrorists from acquiring nuclear weapons.

The biggest obstacle to building a nuclear weapon is the acquisition of the necessary weapons-useable nuclear material. The process of making plutonium or enriching uranium to purity levels required to create a nuclear device is extraordinarily expensive, technically difficult, time-consuming, and likely to be detected. But if a terrorist organization could steal or buy the necessary fissile material, they would not necessarily have to replicate the Manhattan Project to produce a nuclear explosive. Theft or purchase of weapons-useable nuclear material could constitute a major short-cut on the road to developing a nuclear weapon. Therefore, controlling access to weapons-useable fissile material is essential to the prevention of nuclear terrorism.

The proliferation threat is exacerbated by the fact that it is possible to manufacture a nuclear weapon with a surprisingly small amount of nuclear material. Hypothetically, a mass of four kilograms of plutonium is sufficient for one nuclear explosive device; even a small theft of the right kind of nuclear material could radically promote efforts by a terrorist organization or criminal conspiracy to build a bomb.

Many now question whether or not a black market actually exists for fissile material, given recent revelations regarding the role law enforcement agencies played in certain publicized cases of fissile material smuggling. This is not a compelling reason to believe that, in the future, criminal organizations will not attempt to purchase weapons-useable nuclear material, or in fact that such

a purchase has not already occurred. The reality we face is that both supply of and demand for weapons-useable nuclear materials are now permanently in the realm of the possible; the actions we take can only make the supply and demand of weapons-useable fissile material more or less likely at the margin.

II. Fissile Material Security Faces Challenges in Russia and the NIS

The dissolution of the former Soviet Union created new challenges for the protection of fissile material. The former Soviet Union produced more than 1,200 tons of highly enriched uranium and 150 tons of plutonium, theoretically enough to produce tens of thousands of nuclear weapons. Previously, the 80 to 100 facilities in the former Soviet Union where weapons-useable nuclear material is known to be stored could depend on political and financial stability. Now they are spread across new international boundaries; many are located near political flashpoints where armed conflict is common and their security can no longer be guaranteed. Some are uncomfortably close to the borders of states which either harbor nuclear weapons ambitions or sponsor terrorism, or both. Soviet-era population controls have evaporated and organized crime is widespread. Some facilities lack consistent operating funds. Taken together, these challenges constitute a radically changed environment in which fissile materials must be kept secure in Russia and the Newly Independent States.

I will briefly discuss some examples of the kinds of acute challenges currently faced in the areas of fissile material physical protection, material control, and material accounting, the areas of fissile material security with which I am most personally familiar. By discussing these topics, I hope to offer an impression of the depth and breadth of the fissile material security problem, not to delimit it.

Many of the conditions under which former Soviet physical protection systems for fissile materials were designed do not persist today. For instance, personnel are not as readily available to implement the labor-intensive approaches to security used in the past. In some cases, fewer guards have to be stretched further and further. Some facilities have faced difficulties in identifying reliable and cost-effective suppliers of security equipment. Shortages of funds have in some cases caused appropriate maintenance or equipment upgrades to be deferred. Decisions about fissile material security have, in some cases, been based more upon levels of available resources than on identified security needs.

It may not be necessary to overwhelm a security system if it can be circumvented. Perhaps even more dangerous than the threat that security systems protecting nuclear material will be defeated directly is the possibility of an undetected diversion of fissile material. The material control and material accounting systems which counter this threat face at least as many new challenges in Russia and the Newly Independent States as the physical protection systems do, but are generally less well understood.

Fissile material control refers to the procedures and systems that govern who, when, where, and how access is permitted to fissile material. Material control systems are designed largely to combat the "insider threat," whereby personnel authorized to have access to facilities where fissile materials are stored will act or collaborate to divert that material. In the area of fissile material control the situation in Russia and the NIS is fundamentally different than it was during the Soviet era. The evaporation of totalitarian population controls has meant greater freedom for millions, it has also erased one of the bedrock assumptions of Soviet society, a condition which underlay, among many other things, procedures for limiting access to fissile material. At the same time, people who are authorized to have access to fissile materials in Russia and the

Newly Independent States in some cases are not being paid regularly. Although it should always be on the minds of those responsible for preventing the diversion of fissile material anywhere in the world, the “insider threat” is worthy of particular concern today in Russia and the Newly Independent States. The Russian Ministry of Atomic Energy (Minatom) alone employs approximately one million people, many of whom have personally faced economic hardship during the last few years.

A major challenge to accurate fissile material accounting in Russia and the Newly Independent States is that many facilities responsible for the custody of weapons-useable nuclear material have no on-site capacity to assay the isotopic composition of materials they receive into their inventories, relying rather on data supplied by the manufacturer or, less satisfactorily, derivative values calculated by the last facility which held the material, which also may not have had any measurement equipment. Within this system, each material transaction builds uncertainty into the process about the true quantity of fissile material in the inventory. The cumulative effect of an incalculably large number of such transactions over a period of several decades is that there are going to be significant discrepancies between the estimated and the actual values in the inventories of some of the facilities where fissile materials are stored.

In short, Russia and the Newly Independent States face significant challenges in the areas of fissile material protection, control, and accounting.

III. Fissile Material Security in Russia and the NIS Should Be Strengthened

Facility directors in Russia and the Newly Independent States are aware of the vulnerability of the fissile material in their care to theft or diversion, but in many cases they do not have the resources to deal effectively with all of these challenges. The international community has offered considerable assistance, but the challenges our Russian colleagues face cannot be easily overcome. The assistance packages being offered today could be increased ten-fold without addressing every legitimate security concern our colleagues from nuclear facilities in Russia and the Newly Independent States can identify. Hard decisions and trade-offs must constantly be made at any level of commitment; no system can be prepared to defeat every conceivable threat. But it is crucial to remember the stakes, a single act of nuclear terrorism would make all past, present, and planned spending on securing nuclear material seem unforgivably paltry.

By way of example, I would like to describe the way the US Department of Energy’s Nuclear Material, Protection, Control, and Accounting Program has already made a significant difference. First, by sensitizing key players in Russia and the Newly Independent States to the problem, not just at the national level but also at the facility level. DOE’s program involves facility personnel in the decisionmaking process, building a sense of ownership of the tools and ideas, and building a safeguards culture. Secondly, DOE provides the facilities with the means to meet their most urgent security needs.

New approaches which apply state-of-the-art security technology to the development of overlapping systems of physical protection, material control, and material accounting are the mainstay of the Department of Energy’s program. Impressive progress has been made in upgrading the physical protection of nuclear material at numerous sites but every physical protection system relies on assumptions about the scope of the threats that it will face which may or may not be valid and hard choices must be made based on the availability of resources.

In the area of nuclear material control and accounting, many responsible custodians of nuclear material in the former Soviet Union expressed initial disbelief when their American counterparts

suggested that someone might want to steal fissile material and indignation at the idea that someone *inside* their facility might pose a threat. Overcoming that misunderstanding was a major achievement of the MPC&A program, which allowed the employment of technology based material control systems take the guesswork out of over who has access to what material when. They can increase the likelihood and speed of detection of a fissile material diversion, but they will not prevent one.

In the area of material accountability, the United States and other countries are working to install material assay capabilities in facilities in Russia and the Newly Independent States now, which is a crucial step, but is also, in a way, like closing the barn door after the horse has left. Even if every known sample were accurately measured tomorrow, it is impossible to know what is missing with anything approaching 100% accuracy, and 99% accuracy might mean as much as 12 tons of highly enriched uranium and 1.5 tons of plutonium are unaccountable. We can increase our level of confidence in the current fissile material inventories across Russia and the NIS, but it will require commitment and will not yield perfection.

IV. Fissile Material Security Must Be Viewed in the Context of Broader Nonproliferation Efforts

Effective physical protection and material control and accounting systems are an essential element of defense against nuclear terrorism. Many capable people are struggling to keep their fingers in this proverbial dike which prevents a widespread black market in weapons-useable nuclear material from developing. But the bottom line is that this is a delaying tactic. Our efforts to protect nuclear material may be more or less successful at preventing nuclear proliferation or terrorism in the near term, but they will not necessarily stop a potential proliferant state, terrorist organization, or criminal conspiracy determined to acquire a nuclear weapon from achieving that aim over time. From now on we must be prepared to respond to the possibility that weapons-useable nuclear material is for sale. Programs like the US Department of Energy's Nuclear Material Protection, Control, and Accounting Program are our best available means to reduce the possible supply of weapons-useable fissile material to proliferant states or terrorists. But a lasting solution must involve reducing the quantities of weapons-useable fissile material stored anywhere and delegitimizing nuclear weapons as instruments of policy and weapons of war. If the international community can, through responsible action toward the elimination of nuclear weapons, minimize the number of states and organizations incorrigibly committed to the acquisition of nuclear weapons while simultaneously making such weapons and their constituent materials more difficult to obtain, we may be able to deal with the residual threat through technical fixes and law enforcement. But a world in which huge stockpiles of nuclear weapons and weapons-useable nuclear materials are hoarded by legitimate governments as symbols of power and wealth is an invitation to nuclear terrorism.

II. Domestic and International Politics

The Nuclear Legacy and Russian Politics

by Vitaly Shelest

Introduction

1. We include both military and civilian objects into the notion “nuclear legacy”.

The political decision was definitely taken by both executive and legislative branches of power that Russia remains a nuclear power and that it continues to develop both its nuclear weapons and its atomic power plants.

As concerns the military nuclear potential, its creation, development and modes of use are regulated by the military doctrine of Russia, by Russia’s legislation and related international agreements.

The civilian atomic program is based mostly on the principles of economic efficiency, availability of resources and environmental aspects.

2. The general assessment about the nuclear weapons, shared practically by all forces involved, is that it is under adequate control.

Despite well-known problems existing now in the Russian armed forces, the efficiency of Russian nuclear command and control system might be called proper and safe.

This assessment includes the control over the warhead-producing plants, systems of warhead transportation and nuclear weapon sites (both missile and submarines).

There exist no seriously documented cases of nuclear know-how leakage, nuclear experts migration abroad (except in accordance with international agreements) or violation of non-proliferation treaties.

The destruction of nuclear warheads prescribed by international treaties is developing as planned, and sometimes is going on while the corresponding treaties are not ratified yet.

3. The situation with nuclear (radioactive) wastes, on the contrary, is far from being acceptable. It concerns NW-processing, as well as its storage and transportation. Main problems may be listed as follows:

- technology of active zone extraction from nuclear submarines is rather expensive and is not properly supported by the necessary equipment. As this extraction is obviously the most important stage of whole NW treatment process, this problem lies in the core of the existing situation of continuous accumulation of de-commissioned nuclear submarines;

- storage of nuclear (radioactive) wastes is utterly inadequate and lack of new facilities is dramatic. The existing storage sites are full almost in all regions of Russia;
- transportation of nuclear waste from storage sites to processing plants, performed by specially constructed trains, is the closing link in a chain of safety deficiencies, as there are less cars than needed and they are over-exploited;
- and, at last, the processing plant (Mayak) itself is facing serious problems connected with the urgent need to modernize equipment.

4. There are several serious participants in nuclear issues, whose positions are of importance.

- military: Ministry of Defence (including the Navy)
- civilian (Federal): Ministry of Atomic Issues (Minatom),
State committee for Atomic Supervision (Gosatomnadzor),
State Committee for Environmental Protection,
Federal Assembly (Parliament) of the Russian Federation:
State Duma and Federation Council,
Federal Security Service (FSB)
- regional: administrations of Federal subjects and cities (governors and mayors)
- public: Russian Academy of Sciences,
Political parties, trade unions,
green parties and movements,
mass media.

5. As concerns nuclear issues, these forces' interests are to a considerable extent non-contradictory. However, there exist a set of aspects where different approaches are evident and some compromises have to be found:

- distribution of available financial resources (MinDef/Minatom; federal agencies/regional authorities etc.);
- mode of support, be it in monetary form or as equipment (regional authorities/specialized agencies and organizations);
- reasonable requirements for environmental and radioactivity protection (greens/ the rest);
- pace of ecological/radiation clean-up (greens/the rest);
- selection of enterprises involved into NW treatment: government-owned or private respectively (local private business/ central and regional authorities);
- choice of priorities for fund-spending in NW field: effectiveness enhancement of treatment vs infrastructure support (especially for enterprises which are dominant in the cities) — (trade unions/ local authorities, Federal agencies/ local authorities, ecologists/ the rest).

These conflicts of interests are generally solvable, but should be taken into account in planning any NW-activity in Russia.

6. The legislative base for problems of nuclear legacy and, in particular, for NW problems may be described as adequate. However, a set of supporting laws should be worked out and adopted. The level of ecological requirements for radioactivity is comparable or, in some cases, more rigid than in other countries.
7. International collaboration in this field is looked at in a positive way by virtually all participants in the field of nuclear activity. Some conditions should be fulfilled in order to make such collaboration more effective:
 - collaboration, naturally, should be based on strict fulfillment of Russian laws and requirements of national security (FSB, Duma, Minatom, MinDef);
 - foreign participation should preferably be in technological form while compatibility with the existing Russian technologies is a must (Minatom, MinDef);
 - Russian producers' interest should be taken into account (Minatom, local authorities);
 - control over spending of foreign funds/ resources should be fixed in detail in order to provide necessary, but not excessive level of transparency, and in order to prevent circulation of statements which potentially may hinder the collaboration (FSB, MinDef, Minatom);
 - the economical side of such a collaboration should be professionally prepared and assessed and unnecessary restrictions (custom etc.) should be duly removed (Duma, local authorities).
8. The impact of the international community on the processes related to nuclear issues in Russia is as follows:
 - regular discussions and recommendations in international and specialized organizations (IAEA etc.), in bi-lateral negotiations and in mass media.
 - The effectiveness of such influence should neither be neglected nor overestimated: the clue notion here might be due respect to Russia's national dignity under the difficult circumstances of the present period of Russian history;
 - it seems to be feasible to constitute an international public body with professional and political authority, which might be able to provide the interested sides with exclusive data base (permanently being upgraded), as well as with expertise of projects, programs and technologies.

Such high-level international expertise and recommendations should substantially optimize the process of decision-making by national and international bodies.

Planned presently for incorporation, the ATPR NW Foundation (Russian State Duma resolution # 1462, June 4, 1977, submitted to the US Senate resolution draft) might serve as an organization able to fulfill this function.

It is vitally important that this activity is not confined only to bi-lateral efforts of the USA and Russia, but that other technologically developed countries, especially European, take an active part in this endeavor.

Russian Nuclear Politics - A view from the West

by Ulrich Albrecht

To speak about „Russian politics“, let alone nuclear politics, creates presently enormous problems, and the hidden theme of this presentation is going to explain why. „Politics“ in analytical approaches is defined as the process dimension of political intercourse, based on rational choice decisions by actors, in political science vernacular, the „polity“. There are manifold problems in the application of such concepts to contemporary Russia.

1. In a larger research group at the Berlin Free University, called „Forschungsgebietsschwerpunkt“, about societies in transformation a number of fellow researchers tries to understand the „polity“ which presently is in charge of Russian politics.¹ In addition to the common division of power between the (central) government, the parliament (the *Duma*), and the President, the Russian armed forces are repeatedly quoted as some sort of „semi-autonomous force“, meaning as a political entity not under effective control by either other political quarter. Especially the presidency in current Russia seems to represent a climax of institutional sub-differentiation. There are - without constitutional backing - on top of a pyramid the large „Staff of aides to the President“, the Presidential Council, and the Security Council. To continue to muster all bodies in charge of defence affairs (and nuclear matters), one has to add a number of committees supporting the President, such as the „Permanent inter-agency committee for scientific-technological problems of the arms industry“, the „Permanent inter-agency committee for the security of defence“ (?), „The Presidential Department for the arms industry“ as well as - with a staff of its own - an „Expert Soviet“ for armament affairs. This amorphous system remains prolific.

This multitude of institutions in charge of defense matters is reflected in the load of offices which key officials combine in themselves. Thus the deputy prime minister of Russia - on top of his main governmental responsibility - is also chairman of the (my unofficial translation) „Interministerial Commission for Military-Technical Policy“, presides the institution which controls arms exports, is heading the „Interministerial Coordination Council for Military-Technological Policy“ which was established in 1995, chairs the „Federal Government Committee for the Control of Privatization“ (which has got to deal, alongside with less dominant branches, also with the arms industry), and is also in charge of the „Government Commission for Operative Questions“, which is overseeing, among other things, conversion of the arms industries. All these are governmental responsibilities of the Russian deputy prime minister, who is also assumed to control nuclear affairs. In addition, this person acts as chairman of the „Soviet for Cadre Policy with the President.“

Up to now nothing more has happened than a simple account of institutional differentiations in the Russian central government. If a new problem is tabled, e.g. by the US government, the

1 The gist of the argument is to be found in the book by Arndt Hopfmann/Michael Wolf (eds.), Transformation und Interdependenz. Beiträge zur Theorie und Empirie der mittel- und osteuropäischen Systemwechsel, Berlin 1997 (in print). The book contains a more elaborated assessment of the points touched upon in this comment.

answer seems to be that a new Russian committee is created. Michael Brie recently noted „that the apparatus of the President by now is at par with the dimensions of the Soviet CC apparatus and that it dominates the government.“² This amorphous array of institutions suggests that (a) patterns from Soviet times are perpetuated („Soviet for cadre policy“), and (b) that actual regulation outcomes are the product of manifold interactions among these redundant institutions, which approach informal procedures.

For the nuclear field, this implies that present Russian „politics“, if there is indeed a bunch of measures deserving the label, remains difficult to ascertain, if one wants to go beyond official releases.

2. The issue becomes even more blurred in a situation of fiscal crisis with heavy infights inside the heterogeneous network of institutions for scarce resources. The paucity of the public purse tends to convert the informal array from interlocking bodies into a set of interlocking institutions, to produce a stalemate with no visible outcome in terms of specific „politics“. The concept of Non-decisions, in the vein of the argument developed by P. Bachrach and M.S. Baratz about this issue, helps to analyse, beyond the outcome of manifest power relations, the latent and hidden decision processes inside the bureaucracies.³ Applied to present-day Russia and issues of nuclear weapons policy, the concept strongly suggests that the student of nuclear affairs is not well advised to look around for a specific „nuclear policy“.

3. This finding provokes stark reflexions about statehood and government in present Russia. Officially (and according to cohorts of analysts) the enormous country is in the midst of transition, from a state A (Soviet communism) towards a state B (in normative terms, democracy). But the „zapadniki“, the Western-oriented ones, who dearly believe in this Western-style future, form in Russia a minority, and there are strong currents suggesting some sort of „third road“ to the Russian society, a policy path somewhat at variance with Western concepts, possibly more authoritarian.

It is easy to predict a protracted debate about the actual fate of the Russian state. The duality which dominated most of this century - a formal government paralleled by the Party machinery - might be transformed, as it appears today, by a new duality between the „center“ (as the Moscow institutions tend to be labelled in the provinces) and new centers of power emerging in the regions of the vast country. Yet the main conclusion by the political scientist is that states in such phases are internationally impotent and weak, and that they remain unlikely to respond in a meaningful manner to live-and-death matters such as the issue of nuclear weapons.

4. Nobody knows for sure whether the process of dismemberment of the former Soviet Union (and for this, the former Tsarist empire) by now has come to a halt, or whether the present Russian Federation represents a transitory entity with limited prospects of endurance. It will be rapidly understood that an evaluation of this situation entails enormous consequences for

2 Michael Brie, „Rußland: Das Entstehen einer ‘delegierten Demokratie‘“ (Russia: The emergence of a ‘delegated democracy’), in: Wolfgang Merkel/Eberhard Sandschneider/Dieter Segert (eds.), Systemwechsel 2, Opladen 1996, p.170.

3 P. Bachrach/M.S. Baratz, „Power and its two Faces Revisited“, in: American Political Science Review 69 (1975), pp.900-904. Cf. also S. Lukes, Power. A radical view, London 1974.

questions towards Russian politics, also for the mid-term future. Russian analysts presently stress that, after the Chechnyan war, the situation has been stabilized.

Outsiders have got to accept that the conversion of this political animal away from communist statehood remains a frail process, which progresses in non-linear modes. As „democracy“ remains a normative concept which never will be accomplished in full, statehood especially in societies in transition is in actual life an uncertain entity. Defense politics, in contrast to other fields of political activity, remain the arcanum of central state politics, and are hence more intensely married to the ups and downs of statecraft.

5. The main implication of the great transformation for the state is in former communist systems destatisation - the state is pushed back from spheres where it formerly exerted enormous influence. After seven decades at the center of developmental and distributive efforts, in the 1990s the Russian state came under severe attack for being the root cause for failures in precisely these areas. Neoliberal antistatism pushed by international financial institutions and influential Western countries induced further shrinking of state activities.

6. In sum, one should not expect an „active“ nuclear policy by the present Russian state. Nuclear policy, among the other dimensions of defense options, appears as a field especially exposed to foreign sensitivities and anxieties, and given the present dependence of Russia on support from the outside, nuclear policy will be more determined by principal political priorities, in contrast to defense considerations. The Duma may turn down ratification of the START II Treaty, but the reason will not be a new Russian pledge for nuclear rearmament - such a possible decision might represent some sort of blackmail against a government which tends to disregard parliament, or a reaction in kind towards the Americans who once failed to ratify the SALT II Treaty. Thus even key political steps on the nuclear agenda loose, given the present shape of Russian statecraft, in drama in the transformation process.

Nuclear and Conventional Arms Race and Disarmament in Relations Between Russia and NATO

by Alexander I. Nikitin

Changing geopolitical context for the NATO-Russia Relations

Geostrategic changes resulting from the end of Cold War, partition of Soviet Union, establishing of political democracies in former communist states, dissolution of the Warsaw Pact and creation of the new independent states included both destabilizing factors raising international disorder and factors increasing prospects for the establishing of cooperative security system and promoting disarmament (both conventional and nuclear) in Eurasia. Certain positive outcomes were achieved in the 90's in terms of geopolitical context for relations between Russia and NATO. Among these outcomes the following are mostly important.

Division of the Soviet Union, its infrastructure and military heritage has been accomplished though uneasy domestic transformation but still without major open international clashes and didn't directly threaten European security.

Uncontrollability of nuclear strategic or tactical warfare or any parts of conventional armed forces in the FSU (which was a serious concern for the international community in the critical moments of partition of the Soviet Union) was finally prevented

System of **arms control and disarmament agreements** which has been challenged by the legal disappearance of Soviet Union and Warsaw Pact was saved and reconfirmed involving new independent states who shared responsibilities and inherited arms control and disarmament obligations.

Non-proliferation of nuclear weapons policy was reconfirmed, issue of "**inherited nuclear status**" for countries like Ukraine, Belarus and Kazakhstan resolved. These countries joined the Non-Proliferation Treaty in a status of non-nuclear states and accomplished by now passing of the nuclear weapons from their territories to Russia or dismantlement of them.

System of **export control** in FSU (so important to prevent further spread of most modern conventional and especially nuclear armaments) ruined by the partition of the country and 'open borders' between new independent states has been redesigned and mass leakage of nuclear materials and technologies from FSU has been basically prevented

System of **political and military integration** within the Commonwealth of the Independent States was initiated and developed on the principles which remain non-confrontational to the West and NATO.

These factors among other changes of geopolitical context provided a new foundation for a dialogue between Russia and NATO on the matters of political aspects of European security and military provisions for it in both nuclear and conventional spheres.

Nuclear Factor in Relations NATO-Russia

Post Cold War political and strategic environment has brought deep changes into the sphere of nuclear policy of NATO states as well as nuclear policy of Russia. Relations between NATO and Russia in the nuclear sphere couldn't be anymore interpreted as limited to mutual deterrence. Danger of direct massive nuclear confrontation has been dramatically decreased. At the same time logic of deterrence and of nuclear balance unfortunately continue to manifest itself in strategic concepts and policies of NATO nuclear states and of Russia.

One of the central places in 'nuclear' relations between NATO states and Russia is currently occupied by the intensive debates on the status and prospects of nuclear arms control and disarmament. Intensive process of implementation of START I agreement and of parallel (but unilateral) initiatives of reductions of tactical nuclear arsenals is partly blocked by the contradictions around START II treaty and unclear prospects of the announced START III process.

New security concerns and process of arms limitation and reduction

At September 1994 summit between Presidents Eltzyz and Clinton in Washington they agreed to expedite ratification efforts and postulated that once START II is in force, the sides would accelerate deactivation of strategic systems assigned for elimination. USA and Russia also committed themselves to have experts begin considering and examining further strategic arms reductions in form of prospective START III.

Between signing of the START II in January of 1993 and ratification efforts of 1995-1996 there were almost two years of pause caused among other reasons by formal grounds not to resume ratification process. By provisions of the Treaty, START II couldn't enter into force until START I was in force. And START I was halted by the unwillingness of Ukraine to join the NPT in a mode of non-nuclear country as meant by the May 1992 Lisbon Protocol to START I. Only when Ukraine after intensive domestic debates has joined the NPT in December 1994, and START I was empowered, serious ratification process for the START II resumed.

After about a year of debates on January 1996 the US Senate approved a resolution on ratification of START II by a vote of 87 against 4. Among unilateral declarations in-built into ratification resolution the one which has the most far-reaching influence onto future START debates is the one which argues that defenses against ballistic missiles are essential for new deterrent strategies and urges both countries to move forward "cooperatively" in their development and deployment. Knowing clear unwillingness of the Russian side to go along the way of developing missile defense systems and constant applies to preserve ABM treaty limiting such systems in its initial meaning, such declaration of the US Senate fueled the flame of debates in Moscow about the "disproportional consequences" of the treaty to two sides.

Basic concerns expressed and amendments proposed on the Russian side could be grouped into at least three categories: related to strategic balance, related to cost and period of implementation, and related to preservation of ABM treaty.

Concerns and debated suggestions of amendments and modifications of the treaty from the Russian side could be summarized as follows.

- **Reversible Strategic Potential** (rearmament potential) of the sides is to be balanced. Rearmament potentials concern deals with a possibility to reinstall for operational use of warheads which are removed but not destroyed (currently START II allows Russia to have

about 650 reversible warheads, while the USA could possess as many as 4,500-5,000). There are different possible methods of dealing with this imbalance. One would be allow Russia to retain and download all of its SS-19 missiles. Another is undertake measures making reversibility of American Trident SLBM downloading and nuclear reorientation of conventional bombers more difficult or costly.

- **Deadline** originally set for reaching START II ceilings (2003) was hardly realizable for Russia due to budgetary and technical constraints. In spring of 1997 the deadline was agreed to be shifted to the December 31, 2007. That was a part of compromise reached between President Clinton and President Eltzyin in Helsinki summit. This decision removes one of the most persistent argument of the opponents of ratification of the Treaty.
- **Compliance with ABM Treaty** in narrow meaning is to be guaranteed by both sides. It is recommended to formulate at the resolution of ratification that Russia would break its participation at START II treaty if the USA would essentially violate or leave or prepare to leave the ABM treaty. By preparations to leave ABM treaty it is meant essential upgrade of financing of R&D aimed at creation of strategic missile defense systems prohibited by the treaty, as well as creation, testing or deployment of defense systems (and their components) limited by the ABM treaty.
Again Jopint Statement of March 21, 1997 by two Presidents provide some space for compromise, though, ironically, both sides consider the Statement to be a unilateral victory: Russian side reads it as a further prohibition of violations of ABM Treaty while American side reads it as a permission to continue with current shape of missile defense research.
- Methods of liquidation of warheads and silos are economically and ecologically unfavorable to Russia and more favorable to the USA. It is suggested to try to modify at least procedures of destruction of silos as well as to receive technological aid in ecologically safe methods of elimination of toxic heptil fuel of solid-fueled missiles.
- **Destruction of silos** of missiles dismantled under treaty envisages sensible extra costs and in case of need of recovery new silos are too costly for current Russian economy. Critics of the Treaty propose to relax the START II limit of 90 on the number of SS-18 silos that may be converted, to allow all 154 silos left under START I to be converted for single-warhead ICBMs.
- Russia might try to negotiate a **permission to deploy at sea at least one new type of SLBMs or deploy of newly elaborated SLBM in silos on land** (downloaded to single warhead)

- **Window of vulnerability** at the end of first 7 years long stage of reductions is foreseen by Russian strategists if MIRVed launchers would be, as required by stages scheme, cut down to 120 at most (1200 warheads) while permitted SS-25s would be produced and deployed slowly (if at all), not sufficiently to close widening gap with US.
- To avoid window of vulnerability and to be able to meet time pressure Russian side might try to **re-negotiate or omit phases (stages) of reductions** within general length of treaty's implementation
- Finally, and most important from the point of view of NATO-Russia relations, there is a clear political linkage between NATO enlargement and Russia's readiness to reduce armaments. Such link has not only "ideological" meaning. Some Russian strategic planners are seriously frightened by the implications for the strategic balance of the probable deployment of tactical nuclear or/and high-precision medium- and long-range conventional weapons on the territories of new Central European potential NATO members taking into consideration significant counterforce potential which such weapons could have against weakened Russian nuclear arsenal.

More concerns and amendments are debated. At the same time it is clear that some of them are of different scale and importance than others. Basically, the final term of implementation is negotiable as far as Russian side is ready to the basic provisions of the Treaty. Some other concerns could be met "on the margins" without endangering the treaty as such.

The only two conditions which could bury the treaty are:

- 1) clear willingness of Russian side to link START II with full compliance of sides to ABM limitations multiplied by the clear willingness of the US side to proceed with elaboration of the national missile defense system;
- 2) linkage between fate of nuclear arms reductions and enlargement of NATO. "Norwegian model" (no nuclear deployment on the national territory in peace time) if applied to Central European countries and Belarus might serve as ground for compromise possibly in the long run suitable for both NATO and Russia.

Cooperation in the nuclear sphere (areas of relative consent between NATO and Russia)

Areas within a nuclear sphere where there is at the moment more or less elaborated recognition of the consent of the interests of NATO states and Russia could be summarized as follows.

First of all, there is a **shared interest in further non-proliferation of nuclear weapons and other types of weapons of mass destruction.**

USA, other NATO states and Russia acted in rather cooperative manner during preparations and review conference of the Non-Proliferation Treaty.

There is only one major point within non-proliferation field where interpretations of NATO and Russia diverge: this a case of possible deployment of nuclear weapons on the territory of future new NATO members from Central Europe. This possible broadening of geographical scope of deployment of nuclear weapons though legally similar to already existing arrangements between US and Western European allies, is interpreted by Russia as violating the essence and in some aspects concrete provisions of the NPT regime.

Further implementation of the Comprehensive Test Ban agreements reached in 1996 is also within an area of mutual consent between NATO states and Russia. In 1980's and 90's there were at least three periods when unilateral Russian and US temporary moratoria on nuclear tests coincided creating initial opportunities for negotiating a test ban. The pressure onto France at the last stage of negotiations to cut 'last-minute testing series' came from both other NATO states and from Russia. Currently neither three NATO nuclear states nor Russia show any signs of willingness to revise 'stop tests' policy. Necessity to assure technical reliability and maintenance of already existing arsenals in the absence of ground testing might lead to broadening of lab-to-lab cooperation programs between the USA and Russia on the matters of computer-simulated testing if such cooperation wouldn't be limited by the worsening of overall political relations between the West and Russia.

Verified cut-off of production of weapon grade materials is an important and promising area of arms limitations. Of course already existing stocks of weapon grade fissile materials first of all in Russia and the USA are excessive and thus cut-off of further production is not a dramatic turn of the policy. But still this is important area where common language between the sides is mostly found. The residual plutonium production in Russia on Krasnoyarsk atomic power plants does not represent a political problem; there is a political willingness on the Russian side to find alternative ways of electricity supply without producing plutonium as a side product of reactor operation, and cooperation exist on the matters of verification of cut-off of weapon grade materials production.

There is certain understanding on the necessity **of coordinated nuclear reductions and restructuring of triads:**

- if START II is still in dispute (ratified by US, put 'on hold' by Russia) implementation of START I proceed as planned accompanied by the significant cuts in tactical nuclear arsenals under parallel unilateral initiatives (1992) of the USA and Russia;
- Russia and USA committed themselves at the Helsinki summit of 1997 to open soon the START III negotiations on deeper cuts of arsenals (which is expected to remove obstacles from the way of START II ratification by Russia). These START III talks reflect a readiness of Russia and the West to try to compromise on the following matters:
 - lower ceilings for strategic arms limiting warheads by the level of 2000-2500 or even 1000-1500
 - inclusion of SLBMs and some other previously "untouchable» classes of weapons into the process of cuts and reductions;
 - expanding of agreement on reductions from strategic to tactical nuclear weapons area;

- elaboration of new methods of verification and inspections for the new classes of nuclear weapons and carriers;
- negotiating (at last!) scale and methods of liquidation of nuclear warheads (in contrast to elimination of mostly carriers and launchers only as envisaged by all previous nuclear disarmament treaties);

What is urgently needed in the sphere of nuclear disarmament additionally to possible START III negotiations is an elaboration and implementation of measures against accidental or non-intentional use of nuclear weapons. And finally, special set of measures should be aimed to provide peace-time safety of nuclear weapons; this is a point where cooperation between Russia and Western nuclear powers is critical and where transparency and technical cooperation could help a lot.

Contradictions of interests in a nuclear sphere (areas of contradictory interests and current debates between NATO nuclear states and Russia!

- Recognizing listed above cooperative possibilities in the nuclear sphere it is important to consider areas where interests and nuclear policies of NATO states and Russia currently are contradictory towards each other and might remain a source of tensions:
- **Reversible (upload reserve) nuclear potentials** keep to be a subject for complaints about unbalanced consequences of reductions;
- **Tactical nuclear weapons** continue to be out of any formal bilateral arms control patterns, agreements or negotiations;
- **Conventional disarming strike capabilities** (ability to destroy nuclear weapons of one side by conventional high-precision powerful weapons of the other) are growing, and NATO enlargement might seriously increase NATO's ability in this respect which is perceived as a threatening possibility by Russia;
- Willingness of the USA to develop quick **adaptive targeting capabilities** devalue announced postures of detargeting;
- New **Nuclear Guarantees** remain a subject of mutual concerns: US "nuclear umbrella" to new NATO members and possible Russian "nuclear umbrella" for Tashkent Treaty states
- **Missile Defense technology** development (and political strategies of their deployment) bring new complications to the arms control sphere:

TMD (theater missile defense) seems to be crucial for deterrence against regional and non-traditional (sub-strategic) threats, at the same time further upgrading it to the systemic NMD (national missile defense) could be lethal for existing strategic arms limitation regime.

NATO Enlargement: Beyond the Problem of Russian Security Interests

Enlargement of NATO (which has entered a practical stage after the July 1997 Madrid summit of NATO) is a multidimensional issue. It is obvious that enlargement decision and debates have become a major stumbling block on the way of further development of cooperative relations between Russia and NATO. It is important to analyze quite wide group of consequences of enlargement policies which are creating complications for the European cooperative security though are not directly connected with problem of Russian security interests. Going beyond Russian security concerns anyone still need to cope with such issues as speedy militarization of the Central Europe, new dividing lines between 'invitees' and 'non-invitees' to NATO, cost-benefit analysis and issues of inadequate transparency in a process of enlargement.

Militarization of Central Eastern Europe

In the time of peace and after end of Cold War this is NATO enlargement which becomes a reason of and a motivation for unprecedented growth of military spending in Central Eastern Europe. - President of Poland announced plans to increase country's defense spending by 100% till the year 2002. - Ministry of Defense of Czech Republic plans to more than double its budget for weapons procurement until 2000. - Hungary has announced a 22% increase of a military budget for 1997 and trend to keep growth during following years. - Slovenia has allocated \$493 million from its quite tiny national budget for 10-years long expenditures for military reform. But now it plans to spend all money allocated for ten years already before the end of 1998 under the pressure of requirements in case of joining NATO. - Lithuania motivates double increase of military spending from 3 to 5-6% of the overall national budget in 1997 by the necessity to prepare to future application for NATO membership.

Instead of demilitarization of the Central European part of the continent and in the absence of any recognized threat Central European region is entering a new spin of arms accumulation. This is not a peacekeeping aimed section of armed forces which receives most attention and investment. Instead Hungary, Poland, Romania are purchasing advanced weapons systems like Cobra attack helicopters, F-16 and F-18 fighters (Romania even is manufacturing in cooperation with US producer 96 Cobra helicopters on its own territory).

Under such trends it is extremely important to assure that both NATO and Russia give clear priority to CFE-II talks. Current conventional arsenals of NATO, Central European and European CIS countries are lower (with exception of Belarus) than allowed CFE ceilings. New even lower ceilings are to be introduced. NATO enlargement shouldn't become a fuel for intensified militarization of the region between current NATO states and Russia. **Arms limitations and reductions should become an important part of both NATO security 'package' for Central Europe and new compromise in Russia's relations with NATO.**

Cost of Enlargement

Existing analytical estimations of the potential costs of NATO enlargement for NATO itself and for new member-states remain quite underdeveloped.

The "Study on NATO Enlargement" issued in 1995 practically failed to provide any serious estimate of the costs. The most developed publicly open estimate is the one prepared by the US Congressional Budget Office (CBO) issued in March 1996. The study of US Congress estimates

the cost of enlargement of Visegrad for the first 15 years will be between \$ 60,6 billion and \$124,7 billion.

Potential new NATO members, according to existing CBO estimate, may be asked to increase their defense expenditures by at least 60% and possibly over 80% to meet costs of enlargement. It is estimated that existing NATO members would be requested to contribute between \$18,6 billion and \$72,9 billion, depending upon concrete configuration of enlargement. Potential new members from Visegrad countries would be requested to spend between \$42 billion and \$51,8 billion over 15 years.

Independent estimations of costs of enlargement are undertaken (besides US CBO) by RAND Corporation, British American Security Information Council and other think tanks. All of them show that such a scale of spending could quite significantly influence the configuration and trends of economic reforms and development of Central European countries. For some countries whose economy continue to be far from full revival (Baltic states, Romania, Bulgaria, FYROM, etc.) mentioned proportions of costs shares may be truly prohibitive, at least within a decade from now on.

Demand for transparency

Lack of transparency has become a feature of the relations between NATO and cooperation partners countries already on a stage of implementation of Partnership for Peace programme and this problem has been sharpened by preparations to enlargement.

Most of current negotiations between NATO and cooperation partners is tended to be organized at "16+1" format with clear denial of possibility to make content of negotiations publicly open though in many cases it clearly touches security concerns of the neighboring countries. Individual Partnership Programs were negotiated and adopted without making them available to other Partners (the only exception is Hungary which decided to make its IPP publicly available). A lot of mutual suspicions and questions could be avoided if development of IPP and negotiations with Central European candidates for membership wouldn't be kept semi-secret. This sets a dangerous trend and fuels unnecessary suspicions. Just as examples, content and formats of NATO's military interaction with Poland aren't irrelevant for Belarus and Ukraine, or plans for military exercises of NATO jointly with Baltic states are of concern for Russia.

Elaboration of a Baltic Action Plan in late 1996 in a mode of internal document and without any consultations to Belarus or Russia whose security interests are touched upon by the military developments in the Baltic region became another step in the wrong direction (plan as such is probably a useful cooperative tool but it is how it was developed and presented that matters). As a study published jointly by British, American and Belgian research centers points it, "secrecy in NATO relations with Partner countries already reflects a hierarchy of relations between those countries who are favored by NATO for early membership, and those who would be left out. In addition, this secrecy raises the level of anxiety in Russia about NATO's real intentions".

This trend could be reversed by **practice of IPP making available for Partner countries through NACC channels and by taking into consideration concerns of neighbor states in process of enlargement consultations**. And this is not only Russia which is raising concerns in this respect. As, for example, Defense Minister of Romania stresses that if Hungary were admitted to NATO ahead of Romania and without enough transparency, it would be "detrimental to the region's balance and could even lead to an arms race".

Measures for Promoting Disarmament in NATO-Russia Relations

There are some debates within NATO circles whether an Alliance is setting up a right or wrong precedent by concluding with Russia and later Ukraine at separate political and wouldn't this endanger collective cooperation mechanisms like NACC. At the same time basic foundations for concluding such a charter with Russia could be found in Article 4 of the Washington Treaty which presuppose possibility of developing specific relations between Alliance and individual states.

More than that: one of the main differences between PfP and NACC was that PfP openly aimed at differentiation in format, essence and scale of Alliance's relations with different partner states. In this respect concluding an individual framework charter of relations with Russia remains in accordance with partnership mainstream rather than contradicts it.

Analysis of preliminary debates and statements made by sides concerning the general political and more specific military-strategic framework of relations between NATO and Russia brings to the negotiations table certain list of more or less interconnected principles and measures which could promote a disarmament process in relations between Russia and the Alliance.

Steps on a doctrinal level

Further **reconsideration of military doctrines** (strategic concepts and postures) aiming at mutually non-threatening, non-offensive, transparent and cooperative military policies. Doctrines and operational manuals must deeply reflect change of character of challenges and missions of armed forces

Steps in the sphere of nuclear weapons and nuclear policy

- Moving Away from **Launch-on-Warning** Postures
- Measures to reduce the danger of **accidental or non-intentional** use of nuclear weapons
- Verifiable advanced **de-targeting**
- **De-alerting** measures
- **Responsible policy of non-proliferation** including possibly commitment of non-deployment of nuclear weapons on the territory of any states where they are not deployed now
- Enhanced **transparency** measures
- Cooperation in elaboration of more effective and ecologically **adaptable methods of elimination** of warheads, launchers and fissile materials
- Develop joint **mutual risk-reducing planning** for the case of deterrence measures against third parties ("rogue" states, terrorists, counterproliferation actions, etc.)

Steps in the sphere of conventional forces and armaments

- Adaptation of structure of armed forces and armaments to the changed character of challenges and missions
- Elaboration of further measures preventing sides from a possibility of an offensive massive use of armed forces (de-alerting, transparency etc.)
- Further adaptation of the CFE Treaty to new security environment
- Commitment of early mutual notification of all military exercises and of relocation of contingents/armaments exceeding certain agreed level
- Refusal from military exercises in immediate proximity of each other borders, territories and waters
- Orientation towards basic interoperability of Russian and NATO contingents for the cases of cooperation in conflict management (basing upon experience of IFOR)

Relations between NATO and Russia in the 90's went through different stages. Overall balance of the changes since the end of Cold War in these relations is definitely positive. Europe and the world became more secure and less tensed since NATO and Russia committed themselves by concluding a Founding Act on relations in 1997 to developing a partnership and assure non-confrontational mode of relations. But an intermediate period in NATO-Russian relations which lasted since collapse of the Soviet Union and till the full formation and security self-determination of the new independent states including Russia, is coming to an end.

Both NATO and Russia are staying on the threshold of new decisive turn in their security policies. The dialogue between Russia and NATO should be activated to upgrade NATO-Russian relations to a new level of strategic partnership. The alternative is a drawback to the confrontational mode of relations and that would be an unparalleled loss of historic opportunity and a step against basic security interests of Russia and of Alliances' nations.

Russian Public Opinion and the Russian Nuclear Legacy

by Phil Rogers

Abstract: This is an assessment of public opinion in Russia toward nuclear waste and nuclear power and an evaluation of the extent to which public attitudes have any effect on public policy in these two realms. Most of the analysis is based on interviews with Russian experts on this issue, including sociologists, environmental scientists, environmental journalists, and environmental activists. The point of the article is to define what we do and do not know about that topic so as to more effectively structure future research that the author hopes to conduct. The article concludes that even though Russian public opinion evinces a healthy sceptism about nuclear waste and nuclear power since Chernobyl and even though in the last year the public has been increasingly willing to voice that anti-nuclear sentiment in local referenda, at the present time, this opinion is ambivalent, parochial, and somewhat ineffectual. Whether or not this will continue to be the case is the subject for future research.

To make this determination, this future research should:

- make more specific distinctions on the issues (e.g. between attitudes toward the disposal of nuclear waste, attitudes toward the construction of new facilities, or operation of current nuclear power plants).
- make more specific distinctions as to the reasons why voters take an apparent "anti-nuclear" stance in local referenda separating protest votes on unpaid wages from real anti-nuclear sentiments.
- give more attention to the public's willingness to incur economic costs to sustain this anti-nuclear position.
- look for any evidence of a correlation between socio-economic status or perceptions of economic stability or instability and anti-nuclear sentiments.
- look for the depth of differences between those in effected areas (e.g. the so-called "Plutonium Cities") and those father away from the danger zones.
- look for generational differences in the attitudes of the "post Chernobyl" generation.
- pursue a more in-depth analysis of the sense of "political efficacy" in different segments of the public, and, most important of all,
- be careful of jumping from estimations of public opposition to prospects for real political change without taking into account the significant political obstacles in the way of anti-nuclear action.

Growing Nuclear Scepticism & Nascent Political Activism in the Russian Vox Populi.

From one perspective, there are grounds for real optimism in changing Russian attitudes towards the "nuclear issue." By all accounts, the Chernobyl tragedy was a catalyzing experience for the nascent Russian environmentalist movement (which really began with the first signs of Gorbachev's glasnost). After the Chernobyl incident, the membership in anti-nuclear environmental groups grew rapidly and spread throughout the vast Russian federation. In what is perhaps a classic Russian fashion, the number and location of environmental NGOs proliferated rapidly so that now today there are over 150 environmental NGOs scattered from the Western borders of Russia to the Pacific Coast. Moreover, there is growing evidence of an environmental concern in the general public and a cynical scepticism about nuclear issues that extends far beyond "professional" anti-nuclear activists to the general public. Between December 1993 and 1994, this political anti-nuclear sentiment, found fruition in a number of different events. For example, in a poll in Sept. 1994, Vadim Vinichenko concluded that environmental concerns were now a much more important issue than they had been in the past (Vinchenko: 1995). That new importance was reflected by the fact that Russian anti-nuclear groups increasingly brought nuclear issues to be considered before local referenda in Chelybinsk which may bring about the resettlement of 124,000 Tatars exposed to extensive radiation in what is possibly the world's most radiation-poisoned zone. (Kudrick, Igor, Bellona: Oct. 11, 1997). And in Krasnoyarsk Krai, anti-nuclear activists stopped the construction of a radioactive waste storage/disposal facility in the area. Possibly as a partial result of environmental pressure, Russia will shut down 18 nuclear reactors by 2010 (Reuters, January 10, 1997). For example, the VVER-1000 reactor at Kalinin NPP was 70% complete when work was halted in 1990. To date, the zenith of the environmental movement and the most important victory occurred in the referendum in Kostronoma in December 1996 when 87% of the people who voted in the referendum rejected the call to restart construction of a nuclear power station. This is significant because the Ministry of Nuclear Energy campaigned hard claiming that to stop the plant would cost 20,000 jobs. The public rejected such patently exaggerated claims.

Complicating Issues: Wage Disputes not Nukes and Reversible "Successes"

For all the apparent progress, the interpretation of these events is not as straightforward and positive as it might seem. In the first place, in interpreting the results one must separate anti-nuclear sentiments from other motivations. This has not always been done by some analysts and has led to major misconceptions and exaggerated claims. To take one example, there is good evidence to suggest - claims of some environmentalists to the contrary - that the strikes in the Amursky Shipyard in November, 1996, the Zveda Yard of the Trans-Siberian Railroad in June 1997, and the Nerpa Yard on the Kola Peninsula in June 1997 were *far* more a reaction to delayed wages than to concern with nuclear/environmental issues (Kudrick, Igor, Bellona, June 16-1, July 1). Indeed, there is good reason to believe that if the wages had been promptly paid, these political protests would not have occurred. Perhaps even more telling is that the success claimed by the environmentalists is often short-lived or overstated. For example, the "victories" which were claimed in places like Krasnoyarsk and Chelybinsk, were at least partly reversed by subsequent government actions which declared early decisions invalid or succeeded in significantly slowing their implementation (Robert Otrung.) Sometimes, the reaction to environmental initiatives made no attempt at subtle subterfuge. In July, 1997 plant workers and perhaps some local police physically attacked environmental protestors of the Rostov Nuclear Power Plant. Commenting on this picture of confused motives and pyrrhic environmental

victories, environmental activist Alexander Yablokov suggested that the claim of "pure" environmental motives was at best "paradoxical." (Yablokov: 1997: 219). How then should one properly interpret these mixed results?

Different Public Reactions to Three Different Nuclear Questions:

One of the first things to do to lend greater clarity to the analysis of this issue is to disaggregate public responses to "nukes" in general into three different manifestations of the nuclear question: (1) disposal of nuclear wastes (military and civilian); (2) nuclear power for generating energy and nuclear-related facilities such as enrichment plants, and (3) facilities for the development and deployment of nuclear weapons and weapons-grade uranium and plutonium. Russian public opinion is strongly and consistently anti-nuke on the first, "passive-aggressive" on the second, and either ignorant or apathetic (at best) about the third or responsive to Communist or Nationalistic cries "foreign control" on the third (at worst). The vehement, almost visceral reaction to toxic waste is the easiest to see. In every instance in which this is the only issue, - virtually all segments of the population consistently rally to defeat the construction or operation of local sites. This is especially the case when one speaks of "importing" nuclear waste from other states. Not so with the issue of nuclear power. There seems to be some ambivalence here. Consequently, the experts are split on the future public attitude on this topic. In short then, the public reactions to EITHER the environmentalists or the pro-nuclear power people seem to be "passive-aggressive." It may move in the direction of the more powerful or immediate flow but it always does so with some reluctance and ambivalence in the opposite direction. Finally, the general public knows very, very little about Russian nuclear weapons. Their general ignorance is not their fault; the Russian government has kept a tight lid on this issue. The public is consequently reluctant to get into this debate at all. With some exceptions, (usually related to nuclear dumping) it is not an issue which typically is raised. The differences on these issues are largely based on impressions of the various experts. It should be explored more systematically to see if this is, in fact, a real difference.

Political & Cultural Context for Russian Environmental politics: A world of a severe economic crisis & incomplete democratization.

One of the temptations for Western analysts of the Russian domestic debate on nukes is to extrapolate analysis from the West directly into analysis of Russia. This temptation must be resisted because the political and economic context in which the Russian environmental debate now occurs - is fundamentally and qualitatively different than anything in the West and these differences carry profound implications for the analysis of this issue. The starting point for analysis is to remind oneself that Russia is in a state of a severe economic recession. This recession is the backdrop against which all other political issues in Russia must be evaluated. What are the implications of this recession for the issues at hand? First, in relative terms, environmental issues simply do not top the agenda for most people. It is true that environmental issues have now moved up to the number three concern - but the gap between this issue and the first two concerns (crime and the economy) has not really narrowed. These have been the two primary areas of concern for some time. (79% listed organized crime and 70% listed the economy compared to 49% listing the environment). The only exception to this, and it is an important exception, is when the environmental concerns are literally at your backdoor e.g. nearby nuclear waste site. A second implication of the economic recession is that there are fewer educational, personal, and financial resources for local environmental NGOs to use in their

propaganda battles with the local nuclear power companies. If one peruses the list of regional Russian environmental NGOs it is striking how many of the office and home phone numbers are the same. In short, there is often little or no money for an office. The NGO may have shrunk to a literal handful of people operating in a mode of economic survival. Sadly, at the same time that the economic recession produces lethargy toward environmental issues and an financially anemic response by environmental NGOs, the economic recession exacerbates already dire environmental conditions. For example, the necessary maintenance of vitrification equipment has been neglected for financial reasons and the result is that liquid nuclear waste is pumped into the ground and solid nuclear waste is buried in a very unstable state.

The probability of contamination of local water tables is greatly increased as a result. Finally, the end result of a lack of funds is inertia in policy. In a few instances this is an environmental boon - construction of new nuclear power plants can slow to snail's pace or stop altogether as funds dry up. It may be this factor as much or more than nuclear protests and public opinion which has halted the construction of new nuclear power plants in Russia. But this inertia also thwarts more positive developments such as efforts to move nuclear waste sites away from heavily populated areas or water supplies. Apart from the economic recession, the second political backdrop to the Russian environmental movement is the fact that the democratic revolution is working its way only imperfectly - and only in fits and starts - into Russian environmental politics. In fact, there are at least four severe obstacles to democratic political participation in Russia. First, it is extremely difficult to get accurate information because the government has "securitized" the issue. The political scientist Ole Waever has warned of the dangers of such an action precisely because it gives the government immense power. To illustrate the extent of this power, one might simply point out that information about water supplies and water quality for Russian cities over 300,000 is considered a state secret. It is on these grounds that Alexander Nitkin was imprisoned. This "securitization" of environmental information is a product of both a federal law passed by the Duma and a Presidential Decree by Yeltsin. This is ironic because both the Presidential decree and the Duma Legislation violate the Russian Constitution. For this reason, the Socio-Ecological Union is taking this law to the Russian Supreme Court. It is not clear at this stage how successful they will be. Second, there is an absence of real procedural and political power that ensures adequate political participation in the local democratic process. A good example of this is the fact that even though two laws passed the Duma on this issue (Protection from Radiation and Nuclear Health) the laws were written only in the most general terms and they do not specify precisely how the public is to be included. As a result, the interpretation of the law was left up to local and regional authorities. Third, these local officials are often recycled party functionaries whose understanding of political participation is, to say the least, somewhat limited. Finally, and perhaps most importantly, the sense of political efficacy of some of the effected groups may be low. Political efficacy is defined as a belief that one's political participation in the system can be meaningful or effective. There is both external efficacy and internal efficacy. External efficacy is defined as the belief that the system will be responsive to the demands of those who participate. A sense of internal efficacy is defined as the belief that you as an individual have the requisite skills to get the system to respond. Several analysts argued that much of the public in the parochial areas - e.g. the Plutonium cities - may have a low sense of both external and internal political efficacy. The irony may be that those Russians with a higher sense of political efficacy - hence those more likely to do something - may be in places like Moscow and St. Petersburg which are less at risk for nuclear pollution. This is an hypothesis so far untested by empirical data. If it is correct, however, it has important policy implications which could give some direction to regional environmental NGOs. Specifically, it suggests that these environmental NGOs must do more than simply inform the local populace

about the dangers of nuclear pollution - they must convince the populace that something can be done about it and that those local people can do it.

Exploring Subsets of General public opinion

Finally, more empirical work needs to be conducted to look for evidence of differences within this broader public opinion (never a monolithic entity in any society) and factors that seem to correlate with these differences. This is the case first of all within the environmental activists themselves. Oleg Yavlinsky (*Russian Environmentalism: Leading Figures, Facts, and Opinions*, Moscow: Mezhdunarodnyje Otnosheniya Publishing House: 1993) has written a very interesting and important description of variations within the Russian environmental movement. But variations on specific issues - such as attitudes towards nuclear power and tactics for changing policy should be more explored.

There also seems to be a significant debate among Russian sociologists about the political legacy of Chernobyl. While everyone agreed that the political shadow of Chernobyl had caused public opinion to shift from supportive or neutral attitude toward negative or suspicious ambivalence toward nuclear power, the *continuing power* of the legacy seems to be the matter of dispute. How long the Chernobyl effect will last and whether it can be overridden by other concerns seems to be a matter of dispute among the sociologists. Some analysts see a future not unlike the US domestic case where the public increasingly realizes that nuclear power plants are financially unprofitable and begins to shift toward alternate sources of power. In the US, the construction of nuclear power plants has indeed stopped, and it is highly unlikely that it will be revived. Contrast that with the French system. A more cynical prediction of the future is one in which segments of the Russian public living near the plants are bought out by such things as free power.

A third possible division is based on proximity of the danger. There is some evidence that suggests that even the local environmental movements have an attitude characterized as "NIMBY" i.e. not in my backyard. When the danger is close and real to them, environmental issues rank high. However, when the danger is far away, the issues drop off in salience. The discussion is about moving nuclear waste to another site far away regardless of the comparative merits for disposal of such factors as geographic formations, etc. More exploration of this issue would be useful. It would be especially helpful to do comparative public opinion studies of, e.g. Moscow and Tomsk.

A fourth interesting subset would be the local officials and nuclear power plant workers. There is some reason to believe that they do not themselves have a totally uncritical attitude toward issues such as nuclear waste, though this needs to be explored. More importantly, the attitudes of these individuals towards democratic participation and the extent to which they might be persuaded to adopt a more progressive view are also quite important. Finally, it might be interesting to do more extensive work looking for any generational differences (before and after Chernobyl), gender differences, educational and socio-economic differences. While some of this analysis has been done, it has been somewhat limited in focus.

Conclusion:

The point of study is to identify what we know - and what we do not know about Russian public opinion toward nuclear issues. In summary form we can say that we know that the Russian

public is seriously concerned about the possible toxic effects of nuclear radiation especially from nuclear waste sites. They will no longer be easily duped by Government duplicity on this matter. We know that when nuclear waste sites are close that often the public tends to react to move or close the site. However, there are also a number of things about which we can only speculate as this article has done. First, the attitude toward nuclear power plants - as opposed to nuclear waste sites - is a little more ambivalent. Second, the impact of the economic recession and the undemocratic system on public attitudes needs further exploration. Finally, there are a number of subsets within the general public that must be examined, for example, the difference in attitudes of Tomsk versus Moscow.

Russia is faced with both the need to clean up the environmental legacy of the Cold War and the political legacy of centuries as an authoritarian state. Its ability to cope with the environmental nightmare it faces will be the single best test of the degree of real democratization it has attained. The legacy of the Cold War in the US and Russia is one characterized by three demons from the past:

- (1) The false faith in Nuclear Power as a cheap, efficient energy source and the economic and political investment in it which creates a political inertia hard to reverse. While it is quite possible to slow or stop new construction projects, it is much more difficult to get investments, subsidies for creating new plants or converting old ones.
- (2) A massive proliferation of hundreds of tons of nuclear waste including highly radiated material involved in the nuclear weapons including not only the fissile material and radiative "enhancement" material, and irradiated equipment.
- (3) The securitization of environmental energy policies and the consequent legacy of "secrecy" and "duplicity" from the government and public passivity which still persists.

The US Response to the Russian Nuclear Legacy

by Jo L. Husbands

An Introductory Note

This paper discusses the US approach to cooperative efforts to improve the security of nuclear weapons and fissile materials in the former Soviet Union (FSU). Given my own experience, it spends much more time on the issue of fissile materials. I also believe these problems are relatively more urgent -- and that it is possible to show greater evidence of success.

The two key US programs are the Cooperative Threat Reduction Program (a.k.a. Nunn-Lugar) of the Department of Defense and the programs on material protection, control, and accounting (MPC&A) now funded and managed by the Department of Energy. But the International Science and Technology Center run by the State Department, the agreement to purchase 500 metric tons of highly enriched uranium (HEU) from dismantled nuclear weapons, the options for disposition of excess weapons plutonium now under consideration, the programs to improve export controls run by a number of US government agencies, and agreements to exchange data on warheads and fissile materials stockpiles signed at the 1994 summit (and endorsed at subsequent meetings but not yet implemented) should also be considered part of the US approach.¹ I would argue that only this broad view genuinely reflects the degree of US engagement in addressing the problems of the Russian nuclear legacy.

1 For an overview of the programs devoted to fissile materials security, see Matthew Bunn and John P. Holdren, "Managing Military Uranium and Plutonium in the United States and the Former Soviet Union," Annual Review of Energy and the Environment (Fall 1997, forthcoming). An assessment of the DOE MPC&A programs, as well as of broad US nonproliferation export control programs can be found in National Research Council, Proliferation Concerns: Assessing US Efforts to Help Contain Nuclear and Other Dangerous Materials and Technologies in the Former Soviet Union (Washington, DC: National Academy Press, 1997); see also National Research Council, An Assessment of the International Science and Technology Center (Washington, DC: National Academy Press, 1996). Two studies by the National Academy of Sciences Committee on International Security and Arms Control became the foundation for the Clinton Administration's approach to excess weapons plutonium: Management and Disposition of Excess Weapons Plutonium and Management and Disposition of Excess Weapons Plutonium: Reactor-Related Options (Washington, DC: National Academy Press, 1994 and 1995 respectively). For an account and assessment of the HEU deal, see Richard A. Falkenrath, "The HEU Deal," in Graham T. Allison, Owen R. Cote, Jr., Richard A. Falkenrath, and Steven E. Miller, Avoiding Nuclear Anarchy: Containing the Threat of Loose Russian Nuclear Weapons and Fissile Materials (Cambridge, MA: The MIT Press, 1996).

Some General Observations

I believe it is fair to say that the US approach to the nuclear legacy of the former Soviet Union has been driven primarily by worries about proliferation, that is, the dangers of "loose nukes."² A second important motivation has been to ensure that the commitments undertaken in START I -- and the denuclearization of Ukraine, Belarus, and Kazakhstan -- were fulfilled. Very quickly it was realized that, given current conditions in Russia and the other FSU republics, these goals could not be met without substantial financial support from the United States.

Much of the energy and creative drive for dealing with the risks of the Russian nuclear legacy has come from Congress and from experts outside the Executive Branch -- including some who then entered government to carry out the programs they had advocated. As with many stories of US national security policy, personalities matter a great deal to understanding the policy choices that were made.³

The sense of urgency in the US government about the risks of loose nukes has risen and waned -- but has never been as high as some outside experts believe it should be.⁴ At the moment, thanks in part to General Lebed and his stories of missing "suitcase" bombs, we are in another cycle of press and Congressional attention to the risks in Russia, and of accusations that the US government is lagging in its efforts.⁵ The consequences of failure are so obvious and so great that it is easy to be critical of the US approach, but I end up on the side of those who argue that, given the circumstances and a 50-year legacy of secrecy and profound mistrust, the United States and its Russian and other FSU partners have done quite a remarkable job.⁶

Current Status of US Programs

The various US programs that require annual authorization and appropriations from Congress all survived the most recent budget process more or less intact, but as I will discuss below, the battles are difficult each year. Taken together, the US programs try to address the Russian nuclear legacy by efforts to improve the security and safety of (1) nuclear warheads; (2) fissile materials; and (3) people with critical knowledge and skills.

• **The Cooperative Threat Reduction Program** under the Department of Defense received \$382 million dollars for FY1998, which began October 1st. Not all of this will go to nuclear programs in Russia, since CTR now devotes considerable attention -- and expects to give an expanding share of resources -- to the other so-called "weapons of mass destruction," CW and BW. Congress has also restricted its mandate to nonproliferation, ruling out programs devoted to conversion. This has been a source of considerable frustration and tension with the Russians, since it has by and large precluded assistance for housing for retired officers, which many MOD leaders consider a critical problem.

2 For an early account of these dangers, which was very influential in the creation of the Nunn-Lugar program in 1991, see Kurt M. Campbell, Ashton B. Carter, Steven E. Miller, and Charles A. Zraket, *Soviet Nuclear Fission: Control of the Nuclear Arsenal in a Disintegrating Soviet Union* (Cambridge, MA: Center for Science and International Affairs, Harvard University, 1991).

3 A journalistic account of some of these personalities, which is focused only on efforts to prevent nuclear terrorism, can be found in Andrew and Leslie Cockburn, *One Point Safe* (New York: Anchor Books, 1997).

4 See, for example, *Avoiding Nuclear Anarchy*.

5 *One Point Safe* briefly discusses the Lebed story (p.250-51) and argues strongly that the United States should be doing more.

6 See *Proliferation Concerns*, for which the author served as a staff member.

As of mid-1997, the CTR program had helped to deactivate 4,500 Russian nuclear warheads, destroy 81 ICBMs, eliminate 125 ICBM silos, destroy 20 bombers, eliminate 64 SLBM launchers, and seal 58 nuclear warhead test tunnels. In addition, the program helped Ukraine, Belarus, and Kazakhstan to fulfill the terms of their accession to START I and the Nonproliferation Treaty as nonnuclear weapons states by returning some 6,000 nuclear warheads they inherited from the Soviet Union to Russia. Working with Russia to fulfill the terms of the START I and (it is hoped) START II treaty remain the focus of the CTR program.

From the outset, the Russian government was unwilling to permit the United States to have a role in the actual dismantlement of former Soviet/Russian nuclear warheads. The United States therefore cannot say with certainty how many warheads have actually been dismantled at the four Russian dismantlement facilities -- which is a source of criticism from Congress. As one looks ahead to the possibility of a START III agreement, the March 1997 Helsinki summit statements suggest that this situation will have to change. The US government, however, is just beginning to work through both the technical and political challenges this will entail.⁷

The CTR program (with some additional funds from DOE) will also support the recently completed agreements that will end Russian production of weapons-grade plutonium by converting the cores of three reactors so that they no longer produce significant amounts of plutonium. Progress is also being made on the fissile material storage facility at Mayak, the so-called "plutonium palace," although a number of important issues regarding monitoring have yet to be resolved.⁸

Perhaps the single biggest problem with the CTR program has been its inability to actually provide funds to Russians. Initially, explicit "Buy America" provisions meant that almost all the funds went to Western contractors; when those were removed, procurement regulations and the general obduracy of the DOD contracting bureaucracy meant that relatively little funding reached Russian scientists or facilities. In some cases, American equipment would be shipped to Russia or the three other FSU republics even if equivalent local equipment was available. The situation has improved substantially in recent years, but many Russians continue to criticize the program -- and frequently to regard it as the exemplar of the US approach.

7 See, for example, US Department of Energy, *Transparency and Verification Options: An Initial Analysis of Approaches for Monitoring Warhead Dismantlement*, 1997.

8 For example, the current plan would provide for unilateral US monitoring, bilateral US-Russian monitoring, and international monitoring through the IAEA. Some analysts are concerned that the US is emphasizing unilateral monitoring to the detriment of other approaches.

• **The Materials Protection, Control, and Accounting Program** at the Department of Energy (DOE) received its full requested appropriation of \$137 million for FY1998. This program has grown dramatically, from just a few million dollars 5 years ago. Its scope has also grown, particularly since 1994, as DOE finally found the key to success with the Ministry of Atomic Energy (Minatom): direct cooperation between US national laboratories and their Minatom counterparts in Russia. By keeping activities "below the radar screen" of the political process in Moscow, the "lab-to-lab" program was able to assess the extent of the problems with fissile material security, demonstrate approaches to resolving those problems to people who stood to benefit directly from solutions, and build sufficient momentum that the (continuing) reluctance from Minatom headquarters could be overcome.⁹ The DOE program was also able to avoid many of the contracting restrictions suffered by CTR, so that almost from the beginning significant funds actually reached Russian facilities and scientists.

As of now, DOE has some form of access and MPC&A upgrades programs at 44 "sites" in Russia, representing approximately 90% of the facilities with fissile materials, and has completed its upgrades work in Belarus and Uzbekistan. Cooperation to improve the security of materials during transport within and between facilities -- a major source of vulnerability -- is now underway. Cooperation with the Russian Navy and the icebreaker fleet to improve the security of materials for the power reactors used in their vessels has also begun.

These genuine achievements notwithstanding, daunting problems remain. All of the programs got off to an unconscionably slow start; for that, both the United States and Russia share responsibility. Citing the legacy of Cold War mistrust and suspicions brings understanding, but it does not excuse the failure to respond more quickly to obvious risks to international security posed by the deteriorating situation in Russia.

The largest single problem confronting the US government is how much it does not and cannot know. It is now accepted that the Russian government does not know how much fissile material was produced and how much is held at various sites -- and perhaps even whether all the storage sites are known. DOE estimates that *tons* of material are now under internationally acceptable safeguards and *tens of tons* are in partially acceptable systems, but MPC&A systems remain to be installed for *hundreds of tons* more.¹⁰ As of mid-1997, there had been no confirmed cases of thefts or attempted thefts of nuclear materials in over two years, but that could simply be due to thieves becoming more skilled.¹¹ In particular, the flow of goods across the borders of the Central Asian republics is essentially unmonitored and uncontrolled. It is very easy to be frightened by the risks that remain, particularly given the continuing economic problems in Russia and the growing threat from organized crime.

In spite of this grim picture, the MPC&A program has nonetheless achieved genuine successes, and I find myself agreeing with those who argue that it is unrealistic to expect that more have been achieved before now.¹² The real test will come over the next few years as the programs to take advantage of the greatly expanded scope and access are put into place. This is the time at which substantial additional funding might be absorbed and used well.

9 See Proliferation Concerns and Avoiding Nuclear Anarchy for accounts of the lab-to-lab program's development.

10 Proliferation Concerns, p. 69.

11 In a meeting with the committee that produced Proliferation Concerns in Moscow in May 1996, a senior Minatom official said that there had been 23 cases of theft or attempted theft of nuclear-related materials at Minatom facilities during 1993 and 1994, but that only 3 had been successful. He also reported that there had been no thefts or attempted thefts in 1995 and 1996.

12 See Avoiding Nuclear Anarchy for a different assessment.

It is worrisome, however, that a number of the most skilled and effective people in the US government with MPC&A responsibilities have left. Their replacements are not yet all in place, and there is a general sense that the urgency accorded the issue by the White House has declined. If MPC&A issues do not regain high priority and, even more important, sustained high-level attention, then progress could easily stall.

Suggestions for MPC&A

I want to offer two general suggestions for the US approach to the MPC&A, based on the work done at the Academy over the past five years on these issues. In that I am drawing on the work of by many others, both staff and members of our volunteer committees.¹³

- **Recognition of the ultimate Russian responsibility** needs to infuse all US programs. We invented a terrible, bureaucratic verb -- to "indigenize" -- in our effort to convey the importance of finding ways to ensure that, when US funding ends, and when US experts no longer work regularly with their Russian counterparts, the systems they helped put in place will be maintained. This involves everything from political work at the highest levels to create greater recognition of the importance of nonproliferation, to building a culture within Minatom that will enforce and support the new systems, to buying and promoting Russian equipment.

- **Recognition of the need for clear goals and an "exit strategy"** is growing slowly within the DOE program, but there is still a tendency to count the easily quantifiable and not enough thought about what "success" really means. When DOE declared the upgrades completed in Belarus and Uzbekistan in 1996, it was not possible to get a clear statement of what the new "internationally acceptable" standards were to which these facilities now conformed. Nor did there appear to be a plan in place for how those countries would keep those facilities at that level. One finds the same tendency in the programs in Russia. There is an obvious tension between gaining access to as many facilities as possible in Russia while the opportunity exists and finishing the job at any one facility. So far, DOE has continued to emphasize breadth.

The true measure of overall success of the US approach must be the extent to which the vulnerability of nuclear weapons and materials is reduced. As noted above, the US role in addressing the Russian nuclear legacy cannot and should not continue indefinitely. Achieving the goal of the highest possible standards of security is ultimately the responsibility of Russia. The appropriate measure of the effectiveness of specific US programs is thus how well they contribute to achieving security for warheads and materials -- and to enabling Russia to do so on its own. The question of the success of the US approach should be evaluated by such measures as: Did the United States take advantages of opportunities to increase cooperation? Was an appropriate balance found between depth and breadth? Were projects and technical improvements appropriate to Russian needs? Did the projects encourage and support a sense of Russian responsibility, of "ownership" of the programs? These measures are most directly relevant to the programs directed toward improving security for fissile materials and for people with critical knowledge and skills, but it is relevant to the entire US approach.

Domestic Politics and the Future of the US Approach

¹³ See, in particular, Proliferation Concerns.

Every year, the various elements of the US approach to the Russian nuclear legacy face a difficult passage through Congress. The Nunn-Lugar program originated on Capitol Hill, but that enlightened leadership is matched by a group of Senate and House members who remain deeply skeptical of, and in some cases openly hostile to, CTR and other programs.

Part of the Congressional opposition is to spending Department of Defense funds on anything but "real" military programs. Secretary of Defense Perry's eloquent arguments for "defense by other means" failed to persuade these critics, who oppose even such seemingly obvious benefits to US security as cooperation in the dismantlement and destruction of strategic delivery vehicles.¹⁴ Other opposition is part of a general rejection of "foreign aid," no matter what the program. Finally, there is a core in Congress who remain profoundly suspicious of Russia, and who therefore do not want the United States to become engaged in cooperative ventures with a nation they simply do not trust. These people have their counterparts in the Russian Duma, and each frankly serves the interests of the other by reinforcing their mutual suspicions.

So far, the urgency of the problems in Russia and the sustained leadership of a number of members of Congress have saved the programs. But the struggle will continue unless the 1998 Congressional elections result in a significant shift in party alignments or change the composition of the membership. I do not want to end on a pessimistic note, but there is certainly plenty of work for those who advocate US engagement and support for Russian efforts to cope with its nuclear legacy.

¹⁴ See for example, William J. Perry, Annual Report to the President and Congress (Washington, DC: US Department of Defense, March 1996).

European Assistance Programmes to Russia and the Newly Independent States

by Annette Schaper

Motivations and triggers of cooperation

There were several motivations for the cooperation programs between Russia and other Newly Independent States (NIS), and Europe. One of them were security and safety concerns of the nuclear complexes in Russia and the NIS. A major trigger were the nuclear-smuggling incidents in Summer 1994, that caused big headlines especially in Germany.¹ The reasons are the involvement of weapon-grade materials for the first time, and simply the timing: because of the summer holidays, there was a shortage of other interesting news. Another factor was the German public that was already very sensitized, mainly because of environmental concerns. Especially the case of the MOX-finding at the Munich airport caused a tremendous press echo² and a substantial scandal. But while in the US the proliferation concerns are predominant and the activities aim mainly at the prevention of leakage of materials, technologies, and nuclear weapon-relevant knowledge, and of a rearmament of any NIS or of a future state in case of a further breakup of Russia, European concerns are much more in the field of ecology and safety. Also, the smuggling incidents fuelled concerns more in this direction: the major public worry was not a new nuclear weapon state somewhere in East Asia or elsewhere far away, but scenarios of terrorists polluting the environment in Europe.

Memories of the Chernobyl experience are still lingering in the European public, and the public acceptance of nuclear energy is low. Therefore, also the nuclear industry has a strong interest to prevent any other incident in Russia because this would kill all remainders of acceptance immediately. In addition, ecological concerns have a longer tradition in Europe, especially in Germany, than in the US.

Another motivation for cooperation are simply prospects for new markets. Firstly, all cooperation would help to promote the prerequisite which is the transition to market economies in the East. This automatically would create new business opportunities. Secondly, the European nuclear industry is a market leader in safety technologies, and the NIS can become a major customer. Security technologies can play a similar though smaller role, since they are less costly, but on the other hand are practically applied in Europe for many decades already. A potentially big field of cooperation is seen in plutonium recycling technologies, especially MOX, in which the Europeans have long practical experiences in contrast to the US who have a policy of discouraging others from a closed fuel cycle because of nonproliferation.

However, within some elites, the problem of the deteriorating security and the lack of modern standards of material protection, accountancy, and control is also considered important. The

1 A. Schaper, Nuclear smuggling in Europe – real dangers and enigmatic deceptions, Paper presented at the Forum on Illegal Nuclear Traffic: Risks, Safeguards and Countermeasures, Como, Villa Olmo, June 11-13, 1997, proceedings forthcoming 1997; William C. Potter, Before the Deluge? Assessing the Threat Of Nuclear Leakage From the Post-Soviet States, Arms Control Today, October 1995, p. 9-16

2 See for example the summarizing documentation of the Deutsche Welle: Der Atomschmuggel und seine Hintergründe (The atomic smuggling and its backgrounds), October 7, 1994

security of the Russian nuclear production complex is estimated to be far below Western standards and in danger of deteriorating even further.³ Also, a modern State System of Accountancy and Control (SSAC) which is the prerequisite for IAEA safeguards is still lacking in Russia. But it is an official foreign policy goal of Germany and several other European states to implement international safeguards universally, e.g. also in nuclear weapon states.⁴ Therefore, also a foreign policy motivation to raise the standards in Russia exists. Another motivation is simply the pressure of the international community on industrialized states to share the burden in a necessary international task.

Scope of cooperation

In principle, the cooperation with the NIS covers a lot of fields similar to that of non-European states. Tasks of all international cooperation can be distinguished in three areas: disarmament, security and management, and other related topics.

Disarmament cooperation takes place in the fields of weapon systems storage, transportation, dismantlement and destruction of warheads, components and materials storage and disposition of plutonium (Pu) and highly enriched uranium (HEU). A problem of disarmament is the difficulty of verifying the dismantlement of nuclear warheads, because all technical aspects are highly classified. But also the technical irreversibility of the disarmament process is still low: so far, the nuclear components still remain intact, and it is easy to refabricate new ones. Naturally, projects that are close to classified and proliferation relevant information on warheads are not taken up by non-nuclear weapon states such as Germany. Russia has a special tradition of secrecy that goes beyond that of the US, so that even cooperation between these two states is sometimes slow and difficult. However, US-Russian workshops on the verification of dismantling of warheads are said to have produced useful results.⁵ European participation in this field focuses on storage, transportation and disposition. Especially the field of disposition is noteworthy where a joint project of constructing a pilot MOX plant for Russian weapons plutonium is taking place (more details are explained further below). Additional projects aim also at other nonnuclear weapons of mass destruction. There are especially German efforts to destruct chemical weapons.

The area of security and management involves projects on physical protection and management technologies, material control and accountancy (MC&A) which is the technical prerequisite for a legal SSAC, safeguards training and cooperation, national legal systems, export control consultancy, and cooperation on the development of common international standards. Most plants in the US, Russia, China, and in the SON have not been planned to take up safeguards. Therefore, designated measurements points, designs that specifically facilitate an overview on material flows and define strategic points, access for taking samples, installations that enable the applications of tags and seals, limitations for human entries, and other favourable prerequisites

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- 3 V. A. Orlov, Accounting, control, and physical protection of fissile materials and nuclear weapons in the Russian Federation: Current situation and main concerns, Paper presented at the International Seminar on MPC&A in Russia and NIS, Bonn, April 7-8, 1997; Gennadi Pshakin, Security of nuclear materials and installations in Russia, presentation at the Confernece on Nonproliferation, Carnegie Endowment, Washington, D.C, June 10-11, 1997
 - 4 On December 15, 1993, the German Foreign Minister published the "10-Point-Initiative", outlining the goals of German nonproliferation policy, Summary in: Nuclear Proliferation News, Issue No. 5 - Friday, 10 June 1994.
 - 5 A. Schaper, Report of 4th Pugwash-Workshop on The Future of the Nuclear Weapon Complexes of Russia and the USA, Meeting in Sneshinsk, September 11-13, 1997, to be published in the Pugwash Newsletter

for the installation of control equipment might be lacking. Similarly, SSACs compatible with IAEA standards are still lacking.⁶ Russia, at the time being, is reforming its system. Before, the key element was control over people but not technical control over nuclear material. In November 1995, the new Law On The Use Of Atomic Energy was put into force in Russia introducing the internationally recognized principle of measured material balance as a basic concept of the Russian SSAC in contrast to controlling people. It is not yet clear which Russian agency will be responsible for which kind of controls and regulations.⁷ In general, the present concept specifies the following: Minatom is responsible for effecting the MC&A of nuclear materials intended for civil and defense purposes, the Ministry of Defense for effecting the MC&A of nuclear materials for defense purposes, Gosatomnadzor for the oversight of nuclear materials intended for peaceful purposes, and the State Customs Committee controls the transport of nuclear materials across Russian borders.

Other related cooperation programs cover a wide variety of projects, some of them not dealing with nuclear matters at all. But they must also be mentioned because they are extremely costly and constitute the main reason for the obvious imbalance between US and European financial efforts on assistance for the NIS in the nonproliferation and disarmament field. Other projects are defense industry conversion, the International Science and Technology Center (ISTC), a large fraction is spent on reactor safety, and environmental protection and cleanup. And there is special German spending on officers resettlement and retraining, and housing. This has been motivated by the German desire to end the presence of Russian soldiers in Germany after reunification. The sum spent on resettlement, retraining and housing since reunification is estimated to many tens of billions of German mark, which is several times multiplied by thousand of what is spent on the disarmament aid. It can be understood that such exceptional historical circumstances create much stronger motivations than those described in the beginning of this paper. Unfortunately, in the perception of the majority of the public and the parliament, a saturation of spending on Russia has been more than reached. The present economic difficulties add to the unwillingness to increase any funding, despite the insight, that the Russian problems also affect European security.

Who cooperates?

Comparisons between US and European activities are not only difficult because of the emphasis on different cooperation fields but also because of the large number of actors, who often act independently from each other. There is no institution that coordinates or simply has a comprehensive overview on the various activities. Bilateral programs exist at least between NIS and Denmark (Dk), Germany (D), France (F), Great Britain (GB), Italy (I), the Netherlands (Nl), Norway (N), Finland (SF), Sweden (S), and some others. There are additional European and international institutions and programs that run similar projects. The most important ones are:

6 A. N. Roumyantsev, Establishing a SSAC in Russia: structural, organizational, budgetary and political problems, Conference on Fissile Material Security in the CIS, DGAP, Bonn, April 7-8, 1997.

7 Y. G. Volodin, Russian Efforts to Improve Regulation and Maintenance of the Account, Control and Safeguards of Nuclear Materials at Nuclear Installations, Bonn Conference (fn. 6). Volodin is a Gosatomnadzor official. In this paper, the SSAC is called "State MC&A system".

- A cooperation program between Euratom and the Russian Federation that aims at training of inspectors and implementing of safeguards.⁸
- A cooperation program between the Joint Research Center and the Russian Federation that runs a training center in Obninsk in order to develop materials accountancy and safeguards for Russian collaboration. A remarkable aspect of this project is that it made use of Russian technology and work as much as possible from its very beginning in February 1994 and avoided the bitter lesson of the early US-Russian cooperation that initially imposed US technologies on Russia.⁹
- Also, NATO helps funding scientific cooperation on nuclear and other disarmament projects between NATO and former Warsaw Treaty countries.¹⁰
- The ISTC in Moscow has originally been proposed by the former German Foreign minister Genscher. It is jointly funded by the US, the EU, Japan and other states, and aims mainly at preventing proliferation-relevant brain drain,¹¹ by funding projects for Russian nuclear weapon scientists. A similar center has been set up in Kiev.
- A large program is the Tacis program of the EU. It covers not only nuclear cooperation but also many other fields.¹² A large fraction is devoted to nuclear safety and cleanup projects. Disarmament and nonproliferation is only about 1-2 %.

8 Commission of the European Communities, DG XVII, Euratom-Russian cooperation in Nuclear Materials Accountancy and Control, Luxembourg, 31 March 1997

9 European Commission: Communication from the Commission to the Parliament and the Council. Illicit Trafficking in Nuclear Materials and Radioactive Substances – Implementation of the guidelines laid down in the communication from the Commission of 7 September 1994 (COM(94)383) and in the conclusions of the Essen European Council, COM (96) 171, Brussels, 19 April 1996

10 See: <http://www.nato.int/science/sfp01.htm> (NATO Science for Peace Program), October 15, 1997

11 Annual Report of the International Science and Technology Center (ISTC) 1996, Moscow 1997

12 Tacis Contract Information, Published by the European Commission, DGIA, December 1996; Tacis Interim Evaluation Synthesis Report, European Commission, July 1997

Funding of bilateral programs

The following table covers the period of about mid 1992 – Feb. 1997 (in million US \$, unless noted otherwise) according to information provided by the governments. It must be emphasized that more assistance takes place in those NIS where additional European countries are active, e.g. Sweden has a large cooperation project with the Baltic states. For comparison, also Canada (Ca) and the US are included in this table. A distinction is made between the categories of nuclear disarmament, security, and nonproliferation and all others.

Country	category	Russia	Ukraine	Belarus	Kazakhstan
Ca	weap. dism./	–	–	–	–
	other	14.15 Ca \$	16.3 Ca \$	–	–
D	weap. dism./	26.5*	4.4*	–	–
	other	4578*	565*	679*	3.5*
Dk	weap. dism./	–	–	–	–
	other	–	1	–	–
Fr	weap. dism./	?	–	–	–
	other	–	–	–	–
GB	weap. dism./	63	–	–	–
	other	3.3 £	–	–	–
I	weap. dism./	7.5	–	–	–
	other	–	3.7	–	–
N	weap. dism./	–	–	–	–
	other	–	0.8	–	–
NI	weap. dism./	–	–	–	–
	other	–	1	–	–
US	weap. dism./	567.5	266.1	38.9	83.5
	other	213.8	131.7	76.5	60.6

* only 1995 – Feb. 1997

The large number in the category "other" in the German funding can be explained by the housing and officer resettlement program. It is still only a small fraction of the total spending because it is only the sum after 1995.

A comprehensive overview on the various projects would fill many pages. Therefore, just some illustrative examples will be listed.

- US – Russia: Dismantlement and destruction of strategic arms: \$231 million
- D, I, US – Russia: emergency response equipment/training: \$12.7,\$ 7.5, \$15 million. respectively
- ISTC: US \$45 million , EU: \$29 million
- D – Russia: Officers resettlement, housing: \$4520 million (1995-97)
- US – Ukraine: nuclear infrastructure elimination: \$23.4 million
- D, US – Ukraine: nuclear reactor safety/environmental protection: \$43 million (D), \$11 million (US)
- D – Belarus: housing: \$670 million (1995-97)
- D – F – Russia: Pilot plant for MOX fabrication from W-plutonium (joint technical study completed, funding pending)

Two examples will be explained in more detail: the MOX pilot plant and the Tacis program.

The pilot plant for MOX fuel from weapons plutonium

While the largest success in US activities so far is a purchase of large amounts of HEU from dismantled weapons¹³, less progress has been made in US-Russian cooperation on Pu disposition. The main reason is the incompatibility of Russian and American plutonium policies.¹⁴ In Russia, plutonium is regarded a precious recourse that has been expensive to produce, and the US view, that it should be treated as a dangerous waste is not accepted in Russia. On the contrary, a prevailing view holds that in contrast, an elaborate civilian plutonium recycling industry should be installed, including reprocessing and fast breeders. A compromise is a joint Russian-French-German project on a pilot MOX plant for plutonium from dismantled weapons between Minatom, Cogema, the Gesellschaft für Anlagen und Reaktorsicherheit (GRS), and Siemens. So far, a feasibility study has been completed: it designs a pilot plant that would process about one ton W-Pu per year. In a first step, plutonium pits will be dissolved and a powder of uranium oxide and Pu-oxide will be produced as feed material. This part is still close to classified nuclear weapon design, and it will be accomplished by the Russian and French partners. The German partner contributes the technology and the equipment necessary for the fuel rod fabrication, made from the feed material. The German equipment will be used only for WWER-1000 fuel fabrication (light water reactors), while Russian equipment will be used for BN-600 fuel fabrication (breeders).

One ton per year would be just sufficient for the four Russian WWERs, but the amount of Russian excess plutonium is estimated to be about 50-100 tons. The plant will therefore only be a first step that will demonstrate some action and progress. For a larger-scale disposition campaign, additional consuming reactors would be needed. Canada and Japan have already expressed some interest in collaboration. Canada has no domestic closed fuel cycle, but Candu-reactors seem to be easily convertible to MOX fuel. The authors of the feasibility study claim that the scale of the plant could be enlarged rather easily. The costs of the building and equipment of the MOX part are an estimated DM190 million, the cost of the fuel is estimated at about DM2800/ kg heavy metal. A German condition for participation is that the facility and the consuming reactors will be submitted to IAEA safeguards.¹⁵

13 R. A. Falkenrath, *The US-Russian HEU Purchase Agreement: Achievements, Problems, Prospects*; Report of the Center for Science & International Affairs, Harvard University, July 1995

14 Described in detail in: National Academy of Science and German-American Academic Council (GAAC): *US-German Cooperation in the Elimination of Excess Weapons Plutonium*, Bonn and Washington, July 1995. See also *Joint United States/Russian Plutonium Disposition Study*, Washington DC, September 1996

15 In 1995, the proposal was discussed to make use of the abandoned German MOX facility at Hanau which would have secured more transparency than in Russia. But a realization was not pursued because of lacking public acceptance. See: A. Schaper, *Using Existing European MOX Fabrication Plants for the Disposal of Plutonium from Dismantled Warheads*, in: W.G. Sutcliffe (Ed.), *Selected Papers from Global '95*, UCRL-ID-124105, Livermore, June 1996, p.197

Tacis

Tacis is a EU initiative for NIS assistance "which fosters the development of harmonious and prosperous economic and political links between the EU and the NIS".

Its main priorities are:

- public administration
- restructuring of state enterprises and private sector development
- transport and telecommunication
- energy
- nuclear safety and environment
- effective food production, processing, and distribution
- social services and education

More than 2200 projects were funded from 1991 – 1995 with a total of ECU2268 million. About 1 - 2 % were related to nuclear disarmament, nonproliferation, MC&A, and similar projects. This reflects the priorities of interests explained in the beginning of this paper.

Criteria for assessment

There are several questions that must be asked for the evaluation of projects. However, it is unlikely that all questions can get a positive answer simultaneously.

1. Does a project promote military-civilian conversion?

For the sake of nuclear disarmament, this is an important criterion. An example that does not fulfill it is an ISTC project (No. 074) on scientific collaboration between Sarov (Arzamas 16) and Los Alamos on "Shock Waves and Extreme States of Matter". This is typical nuclear weapon physics. However, this project helps to fulfill the second criterion.

2. Does it prevent proliferation-relevant brain drain?

Funding of projects alone is not sufficient for the situation of highly specialized and qualified experts. They also need a professional satisfaction, which makes the conversion difficult. A project that helps to provide individual satisfaction is the above quoted project No. 074 which is therefore effective in preventing brain drain. However, satisfaction could also stem from intelligent scientific conversion.

3. *Does it promote the transition to market economy?*

Not all projects that can be positively evaluated with the other criteria fulfill this one. Basic science does rather not, projects directed at technical applications are more likely. Especially many Tacis projects fulfill this criterion.

4. *Does it help combatting nuclear proliferation?*

Especially projects that promote the security of fissile materials and nuclear installations fulfill this criterion. An important task is the transition of MC&A to international standards.

5. *Does it promote nuclear disarmament?*

Nuclear disarmament is promoted when the irreversibility of disarmament is enhanced. Political irreversibility means the introduction of IAEA safeguards and verification by way of internationally binding commitments. Technical irreversibility is enhanced by the disposition of materials according to the "spent fuel standard", conversion, physical warhead destruction and similar projects. The long term goal must be universal international safeguards.¹⁶

16 W. Walker, Reflections on Nuclear Transparency and Irreversibility: the re-regulation of partially disarmed states, Background paper for the Conference on the Fissile Material Cutoff, Schlangenbad, Germany, 25-27 July 1997

The Nuclear Legacy and the International Community: Ukraine

by Victor Zaborsky

The nuclear legacy of the former Soviet Union in Ukraine is two-fold: nuclear weapons, and nuclear facilities for peaceful purposes. So, in my brief comments I would like to touch upon international efforts in two major areas: withdrawal of nuclear warheads from Ukraine, and ensuring that the civilian nuclear facilities would not become a proliferation threat.

Nuclear weapons. Ukraine inherited 130 SS-19 ICBMs and 46 SS-24 ICBMs with a total number of about 1,800 warheads. The international community faced two challenges at that point - Ukraine's ratification of START I, and Ukraine's joining the NPT as a non-nuclear-weapon state.

As you may recall, Ukraine put forward three major conditions to its ratification of START I and joining the NPT: security guarantees from the nuclear weapon states; financial assistance in dismantling nuclear weapons; and financial compensation for nuclear materials contained in the tactical warheads withdrawn to Russia in 1992. While the third condition was left mostly at the discretion of Russian and Ukrainian governments, the first two requirements were to be met by Western nations. The United States took a lead in that.

Security guarantees. The US administration launched a series of consultations with Ukraine, Russia, as well as with Great Britain, France, and China on this matter. Certain security guarantees for Ukraine were provided in the US-Russian-Ukrainian Trilateral Statement of January 14, 1994. On February 3, 1994 the Ukrainian Parliament voted in favor of exchanging the instruments of ratification of the START I treaty and the Lisbon Protocol. On November 16, 1994, the Ukrainian Parliament approved Ukraine's accession to the NPT, however, contingent upon receiving security guarantees from the nuclear nations in a form of separate documents. Guarantees from the United States, Russia, and the United Kingdom were provided in a memorandum at the Conference on Security and Cooperation in Europe on December 5, 1994 in Budapest. France and China provided security guarantees to Ukraine in separate documents. Thus, Ukraine formally became a non-nuclear weapon state party to the NPT on December 5, 1994.

Financial assistance. The CTR program provided Ukraine with \$175 million assistance, conditional, however, upon Ukraine's ratifying the START I treaty and joining the NPT. Later on, in July 1993, the US decided to begin delivering the dismantlement aid dropping this condition. In March 1994, during President Kravchuk's visit to Washington, President Clinton announced that the US would double its aid for dismantling the nuclear weapons in Ukraine to \$350 million.

The bottom line: On June 1, 1996, the last of some 1,800 nuclear warheads was moved to Russia.

Remaining problems. Although all warheads have been removed, the missiles are still in Ukraine. The Ukrainian government has committed itself to destroy both SS-19s and SS-24s. In 1996, a three-year operation began to dismantle 130 SS-19s. In May 1997, during his visit to Washington, President Kuchma announced a decision to dismantle SS-24s as well. But Ukraine lacks the necessary funds. To facilitate dismantlement, in May 1997, US Secretary of Defense Cohen and Ukrainian Defense Minister Kuzmuk signed a document to add \$47 million to the dismantlement projects in Ukraine. However, due to the project's complexity and high costs, these funds may not be sufficient.

Ukrainian civilian nuclear legacy: The five nuclear power plants in Ukraine are located at Chernobyl, Khmelnytsky, Rivne, Mykolaiv, and Zaporizhye, with fifteen operational units. There are two research reactors in Ukraine: at the Institute for Nuclear Research in Kiev and at the High Marines School of the Ukrainian Ministry of Defense in Sevastopol. Also, Khar'kiv Physical-Technical Institute possesses about 12 kilograms of uranium in bulk form enriched up to 90%. There are two principal uranium mining districts in Ukraine, both located near Zhovti Vody (Yellow Waters): Kirovograd region, and Kryvyi Rig region. All in all, there are about sixty facilities in Ukraine, producing nuclear-related goods and technology. In September 1994, Ukraine signed agreement on full-scope safeguards with the IAEA. This agreement came into force on January 13, 1995. The agreement provides IAEA inspection on all Ukrainian peaceful nuclear activities. The first ad-hoc inspections began in February 1995. The Ministry of Environmental Protection and Nuclear Safety is formally responsible for inventory and control over nuclear materials in Ukraine. In late September 1995, the Ukrainian government set up a body within the Ministry of Environmental Protection and Nuclear Safety to monitor safety precautions at nuclear power plants, nuclear waste storage sites, and nuclear fuel production facilities. The new body is called the Main State Directorate for Control Over Nuclear Safety.

There are other international programs to make Ukrainian civilian nuclear facilities safer and more "proliferation proof." The United States has been the key driving force of these programs. The Cooperative Threat Reduction (CTR) Program provides for a number of nonproliferation tools, the most important of which are MPC&A and promoting effective export controls.

MPC&A - The amount demanded from the US Congress is \$22.5 million. As of May 1997, the amount obligated by Congress is about \$21.5 million, and the amount disbursed is \$6 million. MPC&A improvements have taken place at several sites in Ukraine, including Khar'kiv Physical-Technical Institute, the South Ukraine Nuclear Power Plant in Mykolaiv, the Sevastopol High Marines School Research Reactors, and the Kiev Institute for Nuclear Research.

Problems remaining. Employees at nuclear facilities remain underpaid, which increases the risk of smuggling.

Export controls - After months of difficult negotiations, Ukraine and the United States signed the Nunn-Lugar umbrella agreement on October 23, 1993. The **Agreement Between the Department of Defense of the United States of America and the Expert and Technical Committee of the Cabinet of Ministers of Ukraine Concerning the Provision of Assistance Related to the Establishment of Export Control System to Prevent the Proliferation of Weapons of Mass Destruction From Ukraine** was signed in Kiev, 5 December 1993 authorizing assistance in the establishment of an export control system in Ukraine.

Under the provisions of the Agreement, the US Department of Defense will provide assistance to Ukraine in any or all of the following areas:

- a) Bilateral and multilateral policy and technical level discussions on establishing and implementing multipurpose export control system;
- b) Bilateral discussions and advice on the features of specific multilateral export control regimes and the technical parameters of their control items;
- c) Classroom and on-site training for licensing, enforcement, and other related officials;
- d) Identify organizations and activities in Ukraine which possess, manufacture, or have the potential to produce controlled items;
- e) Provide experts to assist, when appropriate, in the drafting of export control legislation and implementing regulations;
- f) Evaluation and improvement of export control enforcement programs and policies;
- g) Computerized systems and related training to improve tracking and control of controlled items and technology.

The initial amount set for export control assistance to Ukraine was \$2.26 million. On March 21, 1994, the Department of Defense amended the agreement to propose an increase of its assistance up to \$5 million. The total amount of \$7.26 million was obligated in March 1994. In December 1995, this assistance was increased to \$13.26 million resulting from the extension of the agreement for another two-year period. As of May 1997, the total amount obligated by Congress is about \$9.5 million, and the amount disbursed is \$6.3 million.

Remaining Problems. First, on the working level, Ukrainian representatives have pointed out that the assistance reaches Ukraine very slowly, and sometime not in the most effective way. Second, there was a misunderstanding between the State Service of Export Controls (licensing body) and the Customs Committee over the Nunn-Lugar funds. The most recent information indicates that both agencies have come to an agreement. Third, Ukrainian export control officials express fears that, beginning from 1998, when DoS will replace DoD in being in charge of allocating Nunn-Lugar funds, the US assistance policy may change. In private conversations they point out that the State Department demonstrates the intention to make assistance to Ukraine conditional on certain changes in Ukrainian arms sales policy. The Ukrainian government strongly opposes this approach.

US non-governmental assistance to export control developments in Ukraine. Two US nuclear facilities - the Argonne National Laboratory and Los Alamos National Laboratory - have established programs on nuclear export controls in Ukraine. The Argonne National Laboratory has allocated \$40,000 to train nuclear export control experts, and the Los Alamos National Laboratory has allocated \$65,000 to create a database on Ukrainian nuclear enterprises for the State Service on Export Control. Their major counterpart in Ukraine is the Kiev-based Institute for Nuclear Research. Both programs are operated through the US Department of Energy.

Other countries' assistance programs.

Japan. On March 24, 1995, Ukraine and Japan signed a document of cooperation on control of export and import of nuclear materials in order to prevent the proliferation of nuclear weapons. The document was signed by Ukrainian Environmental Protection Minister Yuri Kostenko, and officials of the Japanese Committee on Cooperation in Elimination of Nuclear Weapons. The Committee will make available equipment and services for improving the use and maintenance of control over the export and import of nuclear materials to Ukraine free of charge. Ukraine will also receive aid to improve its state system of monitoring and protection of nuclear materials. The Japanese government also allocated \$16 million to assist with dismantling nuclear weapons in Ukraine.

Canada. In April 1994, Canada announced that it would grant Ukraine \$15 million to assist with nuclear safety, disarmament, and environmental cleanup of military facilities.

Germany. In 1994-95, Germany invested DM 3.5 million into equipment and services to jointly develop environmentally safe silo destruction technologies. A hydroabrasive cutting method was developed and has been used since December 1995.

International Science and Technology Center

The International Science and Technology Center (ISTC) is relevant, though indirectly, for cooperation in the export control area, since it is a multilateral nonproliferation program that provides peaceful employment opportunities to scientists and engineers in the former Soviet Republics who were previously involved with weapons of mass destruction and missile technology. The Science and Technology Center in Kiev was established in July 1994. Canada has pledged to provide \$2 million for the support of the STC in Ukraine, and the executive director position is to be filled by a Canadian; Sweden has pledged \$1.5 million, and the United States \$15 million.

III. Next Steps

The Future of Nuclear Disarmament

by Thomas Graham, Jr.

I would like to thank the Berlin Information-centre for Transatlantic Security for hosting this event and Otfried Nassauer and Oliver Meier especially for asking me here to discuss the future of nuclear disarmament. Nuclear arms control is at a turning point. Remarkable progress has been made over the last few years; goals beyond our reach for decades have finally been achieved: the Comprehensive Test Ban Treaty has been signed and an initial reversal of the superpower arms race has been negotiated through the Strategic Arms Reduction Treaty process. The Nuclear Non-Proliferation Treaty has been strengthened and made permanent, and South Africa, Ukraine, Kazakstan, Belarus, Argentina and Algeria have all forsworn nuclear weapons forever by becoming parties to the Nuclear Non-Proliferation Treaty (NPT).

Amid all this important progress, we are in at least as much danger from nuclear weapons as we have ever been. We face a new nuclear threat today, that the next bomb under the World Trade Center in New York City, or in any other major city in the world, could be a nuclear device. Not long ago, I was at a conference at which a recently retired US general, a man who was thoroughly familiar with the US nuclear weapon program, opined that if substantial progress toward the elimination of nuclear weapons is not achieved in the next ten years, then we can be sure that at some point in the not too distant future a nuclear weapon will be exploded in anger on the territory of the United States. Such words are alarming, but cannot be dismissed. The threat is real.

While nuclear arms control does not offer an easy solution to this problem, it is the best of a very few tools with which we can even begin to address this threat. It falls on the nuclear arms control community, those with the most relevant experience in this area and the most acute awareness of it, to bolster the international nuclear nonproliferation regime so that the use of nuclear weapons can be avoided.

The Treaty on the Nonproliferation of Nuclear Weapons, the NPT, is the cornerstone of international efforts to prevent the further spread of nuclear weapons. The NPT is often criticized as being less than perfect. But having been integrally involved in the negotiation of its indefinite extension in 1995, there is no doubt whatsoever in my mind that the NPT is the only agreement of its kind that we are going to get in the foreseeable future -- it binds all but five of the world's nations to the idea that the further spread of nuclear weapons is illegitimate and illegal. We cannot afford to play philosophical or academic games with our best defense; we need to keep faith with its commitments, strengthen it, and move towards its full implementation as quickly as we are able.

The NPT defined the international nonproliferation regime. The United States acquired nuclear weapons in 1945; the Soviet Union followed suit in 1949, followed by the United Kingdom in 1952, France in 1960, and China in 1964. This increase in the number of nuclear weapon states took place against the background of predictions during the 1960s of 25 - 30 nuclear weapon states -- meaning states with nuclear weapons being integrated into their military arsenals -- by the late 1970s. If such a trend had continued unchecked that number could probably be doubled for 1997. Imagine for a moment a world in which 60 countries had independent nuclear arsenals. That is the reality we averted by negotiating the NPT, and that is the reality we could face again

if we do not keep faith with our disarmament commitments under the NPT. But today the threat would be immeasurably worse because if we cannot limit the spread of nuclear weapons among states we also cannot limit the spread of nuclear weapons to terrorist organizations or criminal conspiracies. We cannot stop the diffusion of 1945 technology forever. And, as we discussed yesterday, fissile material may be for sale. If we deal with nuclear proliferation as a technical problem, we will, eventually, fail.

Proliferation is a political problem, and it demands a political solution, of which the NPT is a solid foundation. Advancing the cause of nuclear disarmament may not, in the end, be enough to avert disaster, but it is the only approach that offers any hope of limiting the problem; it is the only proven technique. The change the NPT made in the international consciousness regarding nuclear weapons was marked. Before the NPT entered into force in 1970, the acquisition of nuclear weapons had been a point of national pride. The NPT, by establishing a norm of international behavior, converted this former act of national pride into a violation of international law. The first French nuclear weapons test was greeted with banner headlines in Paris. Fourteen years later, after the NPT entered into force, the first Indian nuclear test was conducted, figuratively in the middle of the night, and euphemized as a "peaceful nuclear explosion." The number of declared nuclear weapon states is still the same as it was in 1968 when the NPT was signed -- five. There remain three states outside the NPT world system with unsafeguarded nuclear facilities, and compliance problems have occurred with two or three parties -- but 185 countries have become parties to the NPT. There are now only five states that are not part of the NPT regime -- Brazil, Cuba, India, Pakistan, and Israel, and Brazil has announced that it will join soon. The NPT changed the way the whole world thinks of nuclear weapons.

This change was not limited to the non-nuclear weapon states; the commitments of the nuclear weapon states are crucial to the health of the NPT regime and to the future of nuclear arms control. The indefinite extension of the NPT became an invaluable tool with which to promote specific nuclear disarmament objectives. "Keeping faith with New York" was a critical argument for the United States moving to closure on the CTBT and becoming a protocol signatory to the South Pacific and African Nuclear Weapon Free Zone Treaties. The international nonproliferation regime depends at least as much on what happens in Washington, Moscow, London, Paris and Beijing as it does on what happens in New Delhi, Tel Aviv, Islamabad, Pyongyang, Baghdad, or Tehran. The NPT defines a balance of obligations between the nuclear weapons states and the non-nuclear weapons states. The non-nuclear weapons states agree to never acquire nuclear weapons. The nuclear weapons states agree to engage in nuclear disarmament negotiations with the ultimate objective of the elimination of nuclear weapons and also to share the benefits of peaceful nuclear technology. This is the essential bargain that has made all subsequent nuclear arms control possible for the nuclear weapon states and necessary to their security from the standpoint of preventing proliferation.

The NPT is unmistakably a Treaty on the abolition of nuclear weapons. Good faith negotiations toward nuclear disarmament are explicitly mandated in Article VI of the Treaty and the process by which the Treaty was indefinitely extended made that clear. During the NPT indefinite extension debate I spoke with several Ambassadors from countries in the developing world who told me that their countries could not accept second class status forever. In going along with an NPT of indefinite duration they did not agree to the indefinite extension of special privileges for the five nuclear weapon states. They understood that the abolition of nuclear weapons is not conceivable today, a year from now, and perhaps not for several decades. But it is the obligation of all States Parties to the NPT to work toward a world free of nuclear weapons; and this means doing everything that is possible under current conditions to minimize the role nuclear weapons

play in the world. The NPT is the principal line of defense of the civilized world against the increasing risk that nuclear weapons might actually be used by unstable states, dissident sub-national groups, terrorist organizations, and criminal conspiracies. In order for the NPT regime to remain strong and viable the crucial commitment embodied in Article VI and the New York Principles and Objectives -- continued vigorous pursuit of nuclear disarmament -- must be met.

As important as the progress to date has been, more progress is essential in the near term if we are to keep the NPT regime strong. The US National Academy of Sciences has recently released a report recommending that nuclear forces be reduced far more and limited to the "core deterrence" role of simply deterring the use by others of nuclear weapons. The report urges that the United States and Russia reduce as soon as practicable to 1,000 total nuclear weapons -- as opposed to 3,500 strategic weapons each under START II and 2,000 contemplated under START III. The Report urges that promptly thereafter the other three nuclear weapon states be drawn into negotiations aimed at a residual level of 200 - 300 total weapons for the United States and Russia (less for the other three) until the world has changed sufficiently for the ultimate abolition of nuclear weapons to become possible. The Academy further recommends that the United States adopt a "no first use" policy with regard to nuclear weapons as part of the limiting of nuclear weapons to the "core deterrence" function and downgrading their political value (most important for non-proliferation objectives). These are prudent and timely objectives on the long road to a world free of nuclear weapons.

Now, however, domestic politics within Russia and the United States threaten the momentum toward nuclear disarmament built since the end of the Cold War. If the Duma fails to ratify START II, the US Senate has made clear its desire that the United States not reduce its nuclear arsenal below START I levels. Strident criticism of the US stockpile stewardship program threatens the ratification of the CTBT in the Senate; this program was explicitly part of the bargain that allowed the US to sign the CTBT and without it the Treaty likely will fail to secure US Senate approval. Critics of deep cuts in the nuclear arsenals on both sides raise the specter of a renewed Cold War at some time in the future; apparently they would prefer to face renewed tension with more rather than fewer nuclear weapons, although I, for one, would not. An abundance of transient political problems are threatening to derail the nuclear disarmament process.

Mutual unilateral reductions, like those proposed by Presidents Bush and Yeltsin in 1991 for tactical nuclear weapons, could offer a possible way to sidestep the current impasse in the Duma if it is not soon resolved. Russian officials have indicated willingness to consider further reductions. We must seek further progress in disarmament, such as the conclusion of a no first use agreement among the five nuclear weapon states and over time deep cuts in the nuclear arsenals down to minimal levels of nuclear weapons maintained only for the purpose of "core deterrence," as recommended by the National Academy of Sciences. This should be the next phase in the disarmament process. Of course, strategic nuclear arms reductions below START II levels cannot take place unless each side has total and complete confidence in the actions as well as the intentions of the other. Unprecedented and comprehensive transparency measures will be necessary. The nuclear disarmament process will grow ever more complex as we move toward lower and lower levels of nuclear weapons. As we approach zero, arms control verification will take on an entirely new character. Considerations of enforcement will play an ever increasing role. We will not solve all these problems overnight, and that is why we must continue to apply ourselves to them constantly. The arms control community bears special responsibility because we are aware of the problem. There is no higher security priority.

A strong NPT regime is our best defense. And disarmament progress is absolutely essential to the strength of the NPT regime. The good news is that views regarding the role and utility of nuclear weapons can be changed; the NPT has demonstrated that. But change will almost always occur gradually and at the margins. We must keep the pressure on and keep our ultimate goal of a world free of nuclear weapons always in sight, if we are to survive this period in which the world can neither control nor abolish nuclear explosive technology. Today, it is technically possible for a terrorist organization with a nuclear weapon to cause death and destruction on a scale that only a major armed conflict could have caused half a century ago. We will be judged very harshly by future generations if we do not do everything in our power to prevent that from happening.

The Future of Nuclear Disarmament: START II/III and De-alerting Measures

by Nicola Butler

The nuclear arms reduction process is now moving much more slowly than in the early 1990s. No new strategic arms reduction treaties have been negotiated since START II was signed in January 1993.

START I, signed by Presidents Bush and Gorbachev in July 1991 reduced weapons on each side to no more than 6,000 accountable warheads on 1,600 strategic nuclear delivery vehicles. It was closely followed by START II, signed by Bush and Yeltsin, which is intended to reduce strategic warheads to 3,000-3,500 on each side.¹

In January 1996, the US Senate finally ratified START II, but the lower house of the Russian parliament, the State Duma, has yet to ratify the Treaty. At the Helsinki summit of March 1997, Presidents Clinton and Yeltsin agreed a Joint Statement on Parameters on Future Reductions in Nuclear Forces, outlining a framework for START III negotiations.² However, progress on START III remains blocked, with the Clinton Administration refusing to negotiate on START III until the Duma has ratified START II.

1. Obstacles to Duma ratification of START II

Over the last year, Russian officials have highlighted several obstacles to START II ratification in the Duma. These include:

- NATO enlargement;
- US discussion of Ballistic Missile Defense and its effect on the Anti-Ballistic Missile (ABM) Treaty;
- An imbalance in the Treaty against Russian strategic nuclear forces (ie that to maintain parity with the US, Russia would have to build new land-based, single warhead missiles to replace the multi-warhead missiles which must be eliminated);
- Cost of implementation;
- US sub-critical tests;
- and the timescale for implementation of the Treaty.

1 For further details on START I and START II limits and negotiating history, see Institute for Defense and Disarmament, *The Arms Control Reporter*, 1996, pp. 611.A.1-611.E, and 614.A.1-614.E.4.

2 The White House, Office of the Press Secretary, Helsinki, Finland, "Joint Statement on Parameters on Future Reductions in Nuclear Forces", 21 March 1997.

Several steps have been taken to address some of the Duma's concerns. The Joint Statement on Parameters on Future Reductions in Nuclear Forces, lays the groundwork for further reductions to 2,000-2,500 strategic nuclear warheads on each side. In addition, a Joint Statement Concerning the Anti-Ballistic Missile Treaty,³ prepared the way for two further agreed statements on ABM demarcation, signed in New York in September 1997.⁴ In May, the NATO-Russia Founding Act was signed⁵, and a NATO-Russia Permanent Joint Council was established, with arms control and nuclear safety as areas for consultation and cooperation.⁶

In addition, the date by which START II must be implemented has been extended by five years to 31 December 2007, in a protocol to the Treaty signed in September 1997.⁷ Letters were also exchanged on deactivation of all strategic nuclear delivery vehicles covered by START II by 31 December 2003, for which a program of US assistance to Russia will be provided.⁸

However, it remains to be seen whether these measures will be sufficient to convince the Duma to ratify START II.

2. The Future of Strategic Arms Reductions

The Duma is not now expected to act on START III until Spring 1998. This may be particularly difficult timing given that it is exactly when the US Senate will be considering ratification of the first round of NATO enlargement. US Senator Jesse Helms (Republican - North Carolina), chair of the Senate Foreign Relations Committee, has indicated that he has 10 conditions for ratifying NATO enlargement, including that the US Administration must:

- “agree that no limitations will be placed on the numbers of NATO troops or types of weapons to be deployed on territory of new members states (including tactical nuclear weapons)...”
- “explicitly reject Russian efforts to establish a ‘nuclear weapons-free zone’ in Central Europe...”
- “establish a clear delineation of NATO deliberations that are off-limits to Russia (including but not limited to arms control, further Alliance expansion, procurement and strategic doctrine)...”
- “reject any further Russian efforts to link concessions in arms-control negotiations (including the antiquated ABM treaty and the CFE treaty) to NATO expansion...”
- and “develop a plan for a NATO ballistic missile defense system to defend Europe...”⁹

A public debate in the US of this nature is potentially damaging to prospects for Duma ratification of START II.

However, the Duma is not solely responsible for the logjam on strategic arms reductions. The Clinton Administration's insistence that START II must be ratified before START III negotiations can begin is inconsistent with previous practice (for example START II was

3 The White House, Office of the Press Secretary, Helsinki, Finland, “Joint Statement Concerning the Anti-Ballistic Missile Treaty”, 21 March 1997.

4 United States Information Agency (USIA), “Text: Fact Sheet on First Agreed Statement on ABM Treaty”, 26 September 1997; USIA, “Text: Fact Sheet on Second Agreed Statement on ABM Treaty”, 26 September 1997.

5 “Founding Act on Mutual Relations, Cooperation and Security between NATO and the Russian Federation”, Paris, 27 May 1997.

6 “Work Programme of the NATO-Russia Permanent Joint Council until the end of 1997”, excerpts reproduced in BASIC Reports, Number 60, 6 October 1997.

7 USIA, “Text: Fact Sheet on START II Protocol, Letters on Early Deactivation”, 26 September 1997.

8 Ibid.

9 Senator Jesse Helms, “New Members, not new Missions”, Wall Street Journal, 9 July 1997.

negotiated prior to START I ratification by the Senate and the Duma) and has contributed significantly to the slowing of the START process. The quickest way to make progress on strategic arms reductions remains for the US Administration to drop its opposition to beginning START III negotiations immediately.

The effects of deteriorating Russian strategic forces

Many Western observers now believe that the deterioration of Russian nuclear forces, will result in Russia's level of strategic forces falling in the next decade to between 600 and 1,000 warheads. The implication is that Russia will not be able to maintain parity with the US even with a START III agreement at a level lower than 2,000-2,500 (as currently favoured by the Yeltsin administration). Instead, the level of Russian strategic nuclear forces may fall closer to that of some of the smaller nuclear powers.

Indeed, the slowing of progress on START underlines the question of how and when the three smaller nuclear powers should become involved in the process. In the past, bilateral negotiations have been justified on the grounds that they could be completed quickly and efficiently. However, the United Kingdom, France and China cannot be left outside the strategic arms reduction process indefinitely.

Given both US and Russian concerns about the potential threat posed to their respective countries by China, it should be in both their interests to engage China in the process of nuclear arms reductions. Although US nuclear force levels remain high, Russian strategic forces look set to fall to the level at which France and the United Kingdom have previously indicated that they would be prepared to join negotiations.¹⁰

Parties to the nuclear Non-Proliferation Treaty have suggested that the three smaller nuclear powers should contribute to the process. For example, Canada has suggested that these states should make a "political commitment not to increase their nuclear inventories", coupled to START III and has encouraged "discussions now designed to more forward negotiations among the five nuclear-weapon states after the launch of negotiations on START III".¹¹

10 United Kingdom Mission to the United Nations New York, "Statement by the Rt Hon Douglas Hurd CBE MP, Secretary of State for Foreign and Commonwealth Affairs of the United Kingdom of Great Britain and Northern Ireland", 18 April 1995.

11 Permanent Mission of Canada to the United Nations New York, "Statement of Ambassador Mark Moher, Representative and Ambassador of Canada to the United Nations for Disarmament, to the Preparatory Committee of the 2000 Review Conference of the States Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)", New York, 8 April 1997.

START III negotiations

The framework for START III agreed in Helsinki, includes many new areas, which will be important for the future of the strategic arms reduction process. These include measures on transparency and on the destruction of strategic nuclear warheads.¹² This is particularly important since START I and START II did not require destruction of warheads, allowing the US in particular to maintain a “hedge” of additional non-deployed warheads in its stockpile.¹³

In addition, in the context of START III talks, the parties will explore as separate issues, possible measures relating to nuclear long-range sea-launched cruise missiles (a long standing concern of the Russians) and tactical nuclear systems (an issue of concern to both the Russians and NATO).

Both sides, and perhaps particularly the Russians with their goal of parity with the US, have high expectations for START III. With a large number of new issues on the table, concerns have been expressed about how long it may take to negotiate START III and whether a quick agreement should first be reached simply to reduce the aggregate level of warheads on both sides. However, unless this lower aggregate level was immediately agreeable to both parties in spring or summer 1998, perhaps as a protocol to START II, there is a risk that breaking the process into separate steps like this will simply prolong it further.

Another problem with splitting up START III talks is that on the question of tactical nuclear warheads, the US, with only 100-200 tactical warheads remaining in NATO Europe, has little with which to bargain. The answer for US negotiators may be to accept a lower aggregate level of strategic nuclear weapons under START III in exchange for reduction or preferably elimination of tactical nuclear weapons. It may therefore be difficult to separate the question of aggregate levels from other concerns which both parties have indicated that they would like to address.

Ratification of future arms control agreements

Future strategic arms reduction treaties may face similar problems in the Senate and the Duma to START II. Both the Senate and the Duma are currently hostile environments for arms control treaties, often constraining the efforts of their respective administrations. The Russians face the particular problem that it may be difficult to retain parity with the US in the future. However, Russian interests will not be served by blocking START II since Russia is even less likely to be able to retain its nuclear forces at START I levels. Whilst the US could retain nuclear forces at START I levels, the cost of this option on the long term is likely to be unpalatable.

Many NGOs have suggested ways forward on nuclear arms reductions. For example, the National Academy of Sciences Committee on International Security and Arms Control suggests a “regime of progressive constraints”, including an immediate step to 2,000 deployed warheads on each side, limiting all types of warheads, de-alerting measures, revising targeting policy and war planning and relating reductions and ballistic missile defenses.¹⁴ George Bunn and John B. Rhinelanders suggest ways of moving forward despite the Senate-Duma logjam using methods

12 The White House, Office of the Press Secretary, Helsinki, Finland, “Joint Statement on Parameters on Future Reductions in Nuclear Forces”, 21 March 1997.

13 US Department of Defense and Joint Chiefs of Staff, “Nuclear Posture Review”, 22 September 1994.

14 National Academy of Sciences, “The Future of US Nuclear Weapons Policy”, National Academy Press, Washington DC, 1997.

which do not require parliamentary ratification such as reciprocal unilateral measures, “political” commitments, and executive agreements.¹⁵

3. De-alerting

The slowing of the START process has also raised the problem that large numbers of nuclear forces on both sides are still on high levels of alert. Even if START III is negotiated quickly a large number of nuclear weapons will remain, and implementation of strategic arms reductions will stretch well into the next century.

There has been “no significant change” in the alert status of United States (US) intercontinental and submarine launched ballistic missiles since the end of the Cold War.¹⁶ Likewise the UK and France continue to maintain their nuclear armed submarines on patrol at all times. Russia meanwhile has abandoned its policy of no first use of nuclear weapons.¹⁷

In the 1980s NATO countries argued that the first use option was necessary in response to superior Soviet conventional forces. Now Russia plans to compensate for conventional inferiority and crumbling armed forces with nuclear weapons. Russian strategists believe that they could be forced to initiate the use of tactical nuclear weapons during a regional crisis involving NATO or China.

Moreover, Russia is responding to the short flight times and high accuracy of US and British Trident submarine-launched ballistic missiles, by increasing its reliance on strategies such as “launch on warning”. The deterioration of Russia’s strategic nuclear forces mean that it can no longer be confident of retaliating effectively after an overwhelming US first strike. Russia therefore plans to launch missiles after an enemy attack is detected, but before the incoming enemy missiles arrive.

The potential for accidents on both sides as a result of retaining nuclear weapons on hair-trigger alert is obvious. According to many reports, a strategic alert of Russia's “launch on warning” forces was triggered in 1995 by the firing of a Norwegian scientific rocket.¹⁸ Recent reports indicate that deteriorating Russian command-control systems may have caused more incidents when missiles were switched to “combat mode”.¹⁹

Since 1994, the US and the UK have each had bilateral agreements with Russia on detargeting nuclear weapons. France announced in September 1997 that “none of the nuclear missiles in the French deterrent force is now targeted”.²⁰ However, the US states that its missiles could “be returned to their previous targeting status on short notice”.²¹ Likewise the UK can “quickly to

15 George Bunn and John B. Rhinelander, “Viewpoint: The Duma-Senate logjam on arms control: what can be done?”, *The Nonproliferation Review*, Fall 1997, Volume 5, Number 1, Monterey Institute of International Studies.

16 William S Cohen, Secretary of Defense, “Annual Report to the President and the Congress”, US Government Printing Office, April 1997, p.209.

17 “New Russian Doctrine includes Nuclear First Strike”, *Russia Today*, 12 May 1997.

18 Tim Zimmerman, “Is World War III just a false alarm away?”, *US News*, 10 February 1997.

19 Bill Gertz, “Mishaps put Russian missiles on combat mode”, *The Washington Times*, 12 May 1997.

20 Mission Permanente de la France auprès des Nations Unies, “Address by the Minister of Foreign Affairs, Mr Hubert Vedrine: Russia-NATO Permanent Joint Council”, New York, 26 September 1997.

21 William S Cohen, Secretary of Defense, “Annual Report to the President and the Congress”, US Government Printing Office, April 1997, p.209.

restore operational targets” to its missiles should the need arise.²² Russian missiles could be retargeted just as quickly.

In response, a number of NGOs have been promoting the idea of de-alerting to reduce the possibility of an accidental nuclear launch by increasing the time it takes to launch nuclear missiles. Proposals for de-alerting include removing warheads from missiles, disabling missiles by pinning their safety switches open, and keeping nuclear armed submarines out of range of their targets.²³

4. Russian attitudes to de-alerting

At the NATO-Russia summit in May 1997, Russian President Yeltsin appeared to suggest that Russia was now ready to move beyond detargeting, to de-alert nuclear forces by removing warheads from missiles targeted at NATO countries.

On 5 June, speaking to reporters after addressing the United Nations disarmament conference in Geneva, Russian Foreign Minister Primakov outlined a two-staged program. In a first step Russia would detarget all missiles aimed at NATO countries. Then, it could move on towards removing the warheads from the missiles if the US, Britain and France did the same with their weapons.²⁴

Both the US and Russia have agreed to “deactivate” all strategic nuclear delivery vehicles covered by START II by removing their nuclear reentry vehicles or other jointly agreed steps.²⁵ However, Russian officials have indicated that they are cautious about further steps on de-alerting. Russian concerns include:

22 Letter from the Ministry of Defence Directorate of Nuclear Policy to the Campaign for Nuclear Disarmament, 23 February 1994.

23 See Bruce G. Blair, Harold A. Feiveson and Frank N. von Hippel, “Taking Nuclear Weapons off Hair-Trigger Alert”, *Scientific American*, November 1997.

24 E. Primakov in Geneva, from the Embassy of the Russian Federation, Washington DC, 5 June 1997 (unofficial translation).

25 USIA, “Text: Fact Sheet on START II Protocol, Letters on Early Deactivation”, 26 September 1997.

- the time it would take to restore “de-alerted” nuclear delivery systems (especially any which had been deactivated by removal of the warheads) to a state of operational readiness in an emergency;
- the cost of de-alerting (including the cost of building suitable, secure facilities for storage of any separated warheads);
- verification of de-alerting measures;
- and the level of transparency required.

The Russian military is particularly resistant to the idea of de-alerting.

Nonetheless, in September 1997, the US Coalition to Reduce Nuclear Dangers wrote to Foreign Ministers of the NATO nuclear-weapon states and Russia, proposing the establishment of a technical working group of the NATO-Russia Permanent Joint Council. The response from Primakov was that he agreed with Coalition members on “the necessity to take into account the presence of nuclear arsenals in other nuclear powers besides Russia and the US. Inviting the United Kingdom, France and China to discuss problems of nuclear safety, including the issue of lowering the alert status of strategic forces, would undoubtedly have a positive influence on the process of the further reduction of nuclear arms, strengthening mutual trust and cooperation... The specific ideas stated in the letter of the Coalition in this regard will be most definitely taken into account by the Russian representatives in the pursuit of these objectives.”²⁶

This view contrasts with the usual NATO approach that discussions on nuclear arms reductions should be bilateral between the US and Russia, rather than involving the other three nuclear-weapon states. However, there is now an opportunity for all NATO member states to become involved in the discussion on de-alerting as NATO proceeds with the revision of its Strategic Concept over the next year.

5. Conclusion

Whether the route ahead for nuclear arms reductions is through treaties, dealerting or other forms of agreement, the most important thing is that the nuclear arms reduction process should not be allowed to stagnate any longer. The Duma must act promptly to ratify START II: it is clearly in Russia’s interest for reductions to resume quickly. The US Administration must also act promptly to resume negotiations aimed at further nuclear arms reductions and a reduction in the alert status of nuclear weapons.

26 Statement from the Embassy of the Russian Federation, Washington DC, delivered 23 October 1997.

Tactical Nuclear Weapons: The Next Step in Nuclear Arms Control?

by **Oliver Meier**

Tactical nuclear weapons (TNW) have often been cited as the obvious next step in nuclear arms control.¹ However, this argument has not been followed by political action yet. TNW arms reductions are still a unilateral affair. The disarmament initiatives of Presidents Bush and Gorbachev/ Yeltsin have not been codified yet, even though both sides have stated the intention to include TNW in nuclear disarmament regimes.

This paper has three goals: I first want to briefly list the reasons why a treaty on TNW is long overdue, secondly give an explanation why such a treaty does not yet exist and finally develop a proposal how such a treaty could be negotiated. I argue that TNW arms is difficult because these weapons are closely linked to different areas of security policy. Therefore, reductions in TNW are hard to achieve in isolated negotiations. Rather, negotiations on TNW should be part of a broader, comprehensive arms reduction treaty.

1. Why should TNW become part of the nuclear arms control process?

A bi- or multilateral treaty on TNW is both necessary and feasible. Such a treaty could eliminate or at least diminish several dangers. There still exists the danger of a TNW arms race and TNW are the category of nuclear weapons most likely to be stolen or launched by accident. A formal agreement to reduce the number of TNW has become possible because both the US and Russia have recognized the need to control this category of weapons and TNW have lost their primary function, i.e. warfighting.

First, starting immediate negotiations on a treaty on TNW is necessary because such a step would make a new nuclear arms race impossible. TNW are the only category of nuclear weapons still uncontrolled by arms control treaties. After the conclusion of the INF- and START-treaties only short-range nuclear forces remain unchecked. If the nuclear weapons states chose to increase their nuclear weapon capabilities, they could do this only in the tactical field.

Recent developments in both the US and Russia have shown that such a new qualitative or quantitative nuclear arms race is a real danger. The US recently introduced a new type of nuclear weapon into its arsenal, the first new deployment since the end of the Cold War. The B61-11 is a modification of an existing TNW, but it possesses unique capabilities.² With its earth-penetration, bunker-busting abilities the B61-11 is tailored to the new international environment

1 Nikolai Sokov: "Tactical Nuclear Weapons Elimination: Next Steps for Arms Control", in: *The Nonproliferation Review*, Winter 1997, pp. 17-27; William C. Potter: "Next Steps in Nuclear Disarmament: The Challenge of Tactical Nuclear Weapons", Paper prepared for the Seminar on Nuclear Disarmament After the Indefinite Extension of the NPT, Kyoto, Japan, December 2-5, 1996.

2 See Greg Mello: „New bomb, no mission“, in: *Bulletin of Atomic Scientists*, May/ June 1997, pp. 28-32.

as it is seen in the US-defense establishment. Furthermore, the B61-11 will be deployed on a strategic delivery vehicle, the B-2-bomber, and therefore can be delivered world-wide.³

Russia is not only modernizing its tactical nuclear arsenal,⁴ it is also threatening to drastically increase the number of TNW.⁵ These threats have to be taken seriously, because they are part of larger trend to re-emphasize the role of nuclear weapons. With the general deterioration of its economy and armed forces, nuclear weapons are seen by some in Russia as an "equalizer" for the superiority of the West. NATO expansion threatens to amplify these tendencies.

Secondly, negotiating reductions in TNW is necessary because these weapons pose a real threat to international security. TNW are most likely to be stolen or launched by accident. This is especially true for the thousands of Russian TNW. Even though the withdrawal of these weapons to Russian territory has been successfully completed, safe storage remains a problem.⁶

If there nuclear use were to occur, TNW are the type of weapons most likely to be employed in battle. Low-yield nuclear weapons are named as a deterrent for weapons of mass destruction (WMD). Military and civilian command authorities in the West and in Russia still contemplate the use of nuclear weapons in a wide range of counterproliferation scenarios. If such use were to occur, either preemptively or in retaliation for WMD use by other states, TNW are most likely going to be the weapons of choice.

Thirdly, a treaty covering TNW is feasible because both the US and Russia have recognized that the number of these weapons has to be limited. This, after all, was the overriding motivation for the unilateral initiatives of 1991/92. Presidents Clinton and Yeltsin have repeated their intention to establish upper limits for TNW during their bilateral summit in Helsinki in March 1997, when they paved the way for an inclusion of TNW in the bilateral arms control process.⁷

In the US, domestic pressure to move in such a direction is rising. The majority of the arms control community is strongly in favor of including TNW in nuclear arms control. The most recent study of the National Academy of Sciences is just one example for this. The study recommends that "the United States, in full cooperation with its NATO allies, should give serious consideration to seeking an agreement with Russia and other affected states that would prohibit the forward deployment of nuclear weapons in Central Europe. Foreclosing such deployments in a binding, reciprocal, and verifiable manner would be a clear signal that both Russia and NATO were committed to denuclearization of their relationship."⁸ Russia has

3 David A. Fulghum: „Standoff, Penetrating Nuclear Bomb Seen for B-2“, Aviation Week & Space Technology, April 7, 1997, p. 38.

4 Russia is currently developing a new tactical nuclear weapon code-named SS-X-26. Steven J Zaloga: "Russia's SS-X-26: the son of 'Sudc'", Jane's Intelligence Review, March 1996, pp. 102-103.

5 For example in September 1996, Minister of Atomic Energy, Viktor Mikhailov suggested to develop and produce 10,000 "fourth generation" nuclear weapons and threatened cancel the INF-treaty to deploy new SS-20 and SS-23, Sese Nikolai Sokov: "Tactical Nuclear Weapons Elimination: Next Steps for Arms Control", in: The Nonproliferation Review, Winter 1997, pp. 17-27, p. 18.

6 See Oliver Meier: "Russische Atomwaffen: Unsichere Relikte", in: antimilitarismus information, Oktober 1997, S. 27-33.

7 "Joint Statement on Parameters on Future Reductions in Nuclear Forces", Helsinki Summit, 21 March, 1997.

8 National Academy of Sciences: "The Future of US Nuclear Weapons Policy", Washington, DC: National Academy Press 1997, pp. 39-40.

basically recognized the need to eliminate TNW from Europe as well when it lobbied for the establishment of a Nuclear Weapon Free Zone in Central and Eastern Europe.⁹

Could such negotiations become multilateral, involving the other three declared nuclear weapon states? Such a step is possible because the UK and France have all but eliminated their TNW capabilities. France possesses "only" 60-80 air-based TNW, the UK will entirely eliminate these weapons by April 1998.¹⁰

Finally, a treaty limiting TNW has become feasible because these weapons have lost their core function. Both the US and Russian TNW were designed for a large scale conventional conflict in Central Europe - a scenario that clearly does not exist anymore.

2. What are the obstacles on the way to a treaty on TNW?

Why has a treaty on TNW not yet been negotiated if there are such good reasons why it is both necessary and feasible? There are a number of reasons such as difficulties of verification, bureaucratic resistance etc. that generally make arms reduction difficult which certainly also apply to TNW. There is however another factor, that specifically complicates conclusion of such a treaty: TNW - like few other weapon systems - are linked to many different issue areas of security policies. This fact in itself makes TNW reductions or elimination so difficult. While for example, strategic nuclear deterrence in a sense was decoupled from the "ordinary" world of security policies, TNW are closely linked to other topics like conventional security and intra-alliance burden and risk sharing. Any radical and lasting change in TNW postures would therefore necessitate changes in other fields of security policy.

In NATO, for example, the existence of TNW is the basis for nuclear sharing arrangements. Nuclear sharing is one of the basic political compromises underlying NATO policies. To withdraw TNW would therefore necessitate renegotiation of the nuclear bargain between the US and its European allies.¹¹ This is made clear by NATO itself:

9 See Oliver Meier: "A Nuclear Weapon Free Zone in Central and Eastern Europe - Viable Option or Lost Opportunity?", Presentation for the Kyoto International Conference of World Conference Against A-Bombs and H-Bombs, Kyoto, 1-2 August 1997.

10 Jean-Paul Philippe/ Ezio Bonsignore: „Shaping France's Future Defence“, in: *Military Technology*, 6/96, pp. 167-171, p. 171; "Trident takes overall nuclear responsibility", *Jane's Defence Weekly*, October 15, 1997, p. 6.

11 This is true even though the US currently probably deploys no more than 200 nuclear weapons in Europe. See Nassauer, Otfried/ Oliver Meier/ Nicola Butler/ Stephen Young: „US Nuclear NATO Arsenal 1996-97“, Berlin, London, Washington: Berliner Informationszentrum für Transatlantische Sicherheit/ British American Security Information Council (BASIC-BITS-Research Note 97.1), February 1997.

"The security of all Allies is indivisible: an attack on one is an attack on all. Alliance solidarity and strategic unity are accordingly crucial prerequisites for collective security. The achievement of the Alliance's objectives depends critically on the equitable sharing of roles, risks and responsibilities, as well as the benefits, of common defence. The presence of North American conventional and US nuclear forces in Europe remains vital to the security of Europe, which is inseparably linked to that of North America."¹²

New definitions of "burden sharing" and "risk sharing" would have to be found within the Alliance. Discussion about the possibility of nuclear weapons deployment on the territory of new NATO member states has shown how deeply entrenched nuclear defense is in NATO-thinking.

In this context, it is also important to realize that withdrawing TNW from Europe would necessitate a restructuring of large parts of the defense bureaucracy in NATO countries and NATO itself. While it is true that all weapons reductions lead to bureaucratic restructuring (and therefore usually trigger bureaucratic resistance), this resistance is probably much stronger in the case of TNW. After all, elimination of TNW in Europe would make the whole nuclear bureaucracy within NATO superfluous.¹³

Withdrawing the remaining US nuclear weapons from European soil and eliminating the "prestrategic" functions of British and French nuclear weapons in a sense would also require a redefinition of deterrence. TNW are still "last resort" in case of an attack with WMD.

"Prevention of proliferation remains our primary aim, but we noted that NBC proliferation poses a direct military risk to the Alliance and must be taken into account to maintain NATO's ability to safeguard the security of its member states. Alliance military preparedness to deal with this risk is an important aspect of NATO's adaptation to the new security environment. (...) An appropriate mix of conventional response capabilities and passive and active defences, coupled with effective intelligence and surveillance means, would complement Alliance nuclear forces and would reinforce the Alliance's overall deterrence posture against threats posed by proliferation."¹⁴

Eliminating the possibility of nuclear response would therefore make a dialogue on "existential", "minimum" or maybe even "conventional" deterrence necessary. As a result, political answers to proliferation threats would have to become more important.

Limiting TNW or maybe even eliminating these weapons in Russia is so difficult, because these weapons are linked to Russia's conventional security. TNW are seen as "equalizers" for conventional superiority of NATO. E.g. Russia still plans to use nuclear weapons first in the case of danger of the escalation of a regional armed conflict into a larger war to carry out a disarming strike against military objects.¹⁵ "The aim of the Russian Federation's policy in the sphere of nuclear weapons is to avert the threat of nuclear war by deterring aggression against the Russian Federation and its allies."¹⁶ This links any discussions about TNW reductions to negotiations about an adjusted treaty on Conventional Forces in Europe. Only if Russia will get the

12 "The Alliance's New Strategic Concept", Rome, November 7.-8. 1991.

13 For a summary of nuclear planning after the end of the Cold War see Hans M. Kristensen: "Targets of Opportunity", in: Bulletin of Atomic Scientists, September/ October 1997, pp. 22-28.

14 NATO Defense Planning Committee, Bruxelles. November 29, 1995, NATO-Press Release M-DPC(NPG-2(95)117).

15 Igor Korotchenko: "Changes in the Procedure of the Nuclear Weapons Planning", Nezavisimaya Gazeta, February 13, 1997.

16 "Basic Provisions of the Military Doctrine of the Russian Federation", quoted in Jane's Intelligence Review, January 1994, p. 6.

impression that its conventional security is not threatened by an enlarged NATO, would it be willing to accept limitations on its tactical nuclear arsenal.

Talks about TNW reductions are further complicated by the fact that nuclear weapons in Russia are increasingly linked to its status as a global power. In a time of political and economic collapse, the military increasingly is seen as a symbol international importance. Since the Red Army itself is in a very difficult situation, nuclear weapons particularly are being used as status symbols. Even though nuclear weapons do have symbolic functions in all nuclear weapon states, this function may be more important in Russia at the moment.¹⁷

Finally, just like in NATO, Russian TNW are more and more closely linked to threats resulting from proliferation of WMD. For example, recent statements by Russian officials indicate that security along the Southern border of the Russian Federation is supposed to be guaranteed also with the help of nuclear weapons.¹⁸

3. A possible approach to reduce TNW in Europe

What then needs to be done? If it true, that it is hard to agree on deep cuts in TNW because such reductions would have severe consequences in many different areas of security policy, the obvious solution would be to devise an approach that is as comprehensive as possible. This way, many of the consequences resulting from TNW reductions could be taken care of in the context of such talks. Comprehensive nuclear Arms Reduction Talks (CART) should link strategic to tactical disarmament issues, while at the same time opening up a dialogue on nuclear doctrines to enable a new consensus on the role of nuclear weapons.¹⁹

Such an approach is different than current one of separately negotiating different nuclear disarmament issues. While separate, focused negotiations have the advantage of possibly achieving faster progress than more comprehensive talks, their results are often also much harder to implement. The difficulties of getting START II ratified because related issues have not been dealt with in these negotiations can serve as a warning example here. Similarly, the unilateral disarmament initiatives of 1991/92 have not been fully implemented yet because of technical problems and domestic opposition.

17 See Stephen P. Lambert/ David A. Miller: "Russia's Crumbling Nuclear Weapons Complex: An Opportunity for Arms Control", Colorado: USAF Institute for National Security Studies (INSS Occasional Paper 12, Regional Series), April 1997.

18 Nikolai Sokov: "Tactical Nuclear Weapons Elimination: Next Steps for Arms Control", in: The Nonproliferation Review, Winter 1997, pp. 17-27

19 For such a proposal see Berlin Information-center for Transatlantic Security (BITS): "Next START by CART: Breaking the disarmament deadlock", Berlin: BITS Policy Note 97.1, March 1997.

Comprehensive Nuclear Arms Reduction Talks on the other hand have the advantage that they can anticipate difficulties with implementation and ratification. In that sense, the fact that START III is a kind of basket, where all the unresolved issues have been put in, may actually be an advantage because it opens up the possibility of linkages between the different security issues. The newly founded NATO-Russia Permanent Joint Council would be ideally suited for such talks since it has a broad mandate and four out of the five declared nuclear weapon states are participating in the 16+1-process.²⁰

20 See for example Berlin Information-center for Transatlantic Security (BITS)/ British American Security Information Council (BASIC)/ Centre for European Security and Disarmament (CESD)/ Centro de Investigación para la Paz (CIP): "A Fresh Start for START - NATO Summit Faces Options for Change", Berlin/ London/ Washington/ Brussels/ Madrid: Summit Briefing Paper 97.2, July 3, 1997.

Problems in Identifying the Tactical Nuclear Weapons Arsenal of the Russian Federation

by Georg Schöfbänker

Introduction

Since the end of the Cold War, huge arsenals of tactical nuclear weapons (TNWs) have been withdrawn unilaterally from Europe or have been taken out of active military service. Russia withdrew its tactical nuclear arsenal from the former Warsaw Pact Member States and from all former Soviet Republics outside the Russian Federation (RF). This information seems to be widely shared and known in the arms-control community. It is known in the open literature that the RF still has a huge arsenal of TNWs stored in military depositories under the custody of the Russian Department of Defense (DoD), or in the stage of dismantlement down to the primary elements of the so called pits¹ in one of the nuclear weapons production facilities operated by the Russian Ministry of Energy (Minatom).

The unilateral disarmament and dismantlement initiatives about TNWs during the Gorbachev, Bush and Yelzin administrations have erased from public awareness the relevance of TNWs. To put it frankly: The only two nuclear weapons ever used in a war (against Japan) had a yield in the range of 15 and 20 kTs of conventional explosives. This yield equals today's TNWs. The destructive power of these weapons is widely known and has been investigated for decades.

The problem of Russian TNWs assumes dramatic dimensions when one seriously starts to analyze the 'loose nukes-debate'. Stolen or diverted tactical warheads - not secured by electronic permissive action links (PALs) - could be in the hand of terrorists or rogue states. Both, Western experts and their Russian colleagues, are for a few years extremely concerned about such a scenario. Even Hollywood cannot stand aside and devoted a recent production, the movie 'Peacemaker' to this case. The more, a discrimination between facts and fiction seems necessary.

1 A 'pit' is a warhead in the state of dismantlement after the conventional explosives have been removed, but the basic geometry of the warhead design remains untouched and the fission and fusion components are stored on shelves. Verifying the destruction of 'pits' seems possible in case the concrete design information of weapons physics would not proliferate to the verifying party.

From Opacity to Transparency?

Whereas in the field of strategic nuclear weapons, since the beginning of the START negotiations, more or less exact figures are available, all estimates for TNWs are extraordinarily vague. Such prominent sources as the SIPRI Yearbook 1997 or IISS's 'The Military Balance 1996/97' even go as far as not to mention the Russian TNWs. A publication from the Carnegie Endowment for International Peace, Washington DC stated in 1995: „Estimates of the total number of warheads on tactical nuclear weapons in Russia range from 6.000 to 13.000. Proportion deployed vs. proportion held in storage or dismantlement facilities not known.“² Neither in 'Arms Control Today' nor in the 'Bulletin of the Atomic Scientists' has there been an article in recent years dealing with the Russian TNWs. The 'Bulletins' *Nuclear Notebook*, compiled by NRDC, counted in Sep/Oct 1996 about 3.200 active TNWs (Navy, Air Force and Army) and in May/June 1997 it states: „Because the size of operational nonstrategic forces is limited to the number of delivery systems, the actual number of fielded warheads is probably about 4.500. The status of an additional 10.000 warheads is unclear. Most are probably awaiting dismantlement but some could be retained as part of the Russian 'hedge'“.³ Pugwash sources counted in October 1996 some 3.900 Russian TNWs.⁴ NRDC's homepage currently counts 3.300 TNWs.⁵

French Sources are counting TNWs in the range of 18.000 to 20.000. „In a report published in May 1997 the French Ministry of Defense is concerned at the number of Russian tactical nuclear missiles -- between 18,000 and 20,000 -- and doubts Russia knows their exact number or is destroying those it should, according to an official French report.“⁶ Official NATO sources, e.g. the Nuclear Planning Group, on her 12th June 1997 meeting, are also not very helpful in identifying Russian TNWs:

„Russia still retains a large number of tactical nuclear weapons of all types. We renew our call upon Russia to bring to completion the reductions in its tactical nuclear weapons announced in 1991 and 1992, and to further review its tactical nuclear weapons stockpile with a view towards making additional significant reductions.“⁷

The 'US News and World Report' reported in June 1997 on the basis of research from Nikolai Sokov, former Russian START delegation member and currently fellow at the Monterey Institute of International Studies in California: „For now, only about 3,000 of Russia's tactical nuclear weapons remain deployed with operational units, while some 10,000 have been consolidated in secure storage areas.“⁸

2 Spector, Leonard S; McDonough, Mark G.; Medeiros, Evan S. (1995): Tracking Nuclear Proliferation, Carnegie Endowment for International Peace, Washington DC, 37.

3 Nuclear Notebook (1997). Estimated Russian Stockpile, End of 1996. In: The Bulletin of the Atomic Scientists, Vol. 53, No. 3, May/June 1997, 62-64, here 64.

4 Cochran et al (1996): Pugwash Meeting No 221, 25th Workshop on Nuclear Forces. London, 25-27 October 1996: Progress in Nuclear Weapons Elimination, Paper.

5 <http://www.nrdc.org/nrdcpro/nudb/datab13.html>

6 Reuters, Paris, May 2.

7 PRESS COMMUNIQUE M-DPC/NPG-1(97)70, 12th June 1997: Ministerial Meetings of the Defense Planning Committee and the Nuclear Planning Group on 12th June 1997, Final Communiqué, para. 11

8 Zimmermann, Tim: Russia's ace in the hole. Resurrecting a nuclear Maginot line. US News and World Report. June 2, 1997.

TNW-counting in the Russian Federation still seems to have some characteristics of what was formerly called 'Kremlin astrology'. Members of the scientific community are quoting each other's numbers. More or less reliable sources are exchanged. There is absolutely no public information on tactical nuclear weapons from the Russian official sources. „All information available is unofficial, provided by nongovernmental organizations: treaties and official exchange of information covered only delivery systems.“⁹

What has been achieved in strategic arms control, a reliable source based upon the official information exchange between the US and Russia, should be of interest in the field of TNWs as well. It could prohibit further rumors about Russian 'loose-nukes' and open negotiations on reducing TNWs, as it has been announced at the Helsinki summit statement by the presidents Clinton and Yeltsin:

„The Presidents also agreed that in the context of START III negotiations their experts will explore, as separate issues, possible measures relating to nuclear long-range sea-launched cruise missiles and tactical nuclear systems, to include appropriate confidence-building and transparency measures.“¹⁰

The 'loose-nukes' Syndrome

What is good for Hollywood and the media is bad for serious science. Clearly contradictory reports about the state of 'loose' Russian nuclear weapons and fissile materials have been published. The well received MIT-Study from *Allison, Coté, Falkenrath* and *Miller* 1996 was entitled: 'Avoiding Nuclear Anarchy. Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material.'¹¹ Their central message is:

„As the result of the dramatic events since the fall of the Berlin Wall, has the likelihood that a nuclear weapon will explode on US territory gone up, or gone down? Our answer is unambiguous: it has gone up. Even as the probability of large-scale nuclear war between the United States and Russia has *decreased* dramatically, the probability that a nuclear weapon will detonate in Russia, or Europe, or the Middle East, or even the United States has *increased*.“¹² The authors apparently blame the Russian nuclear legacy and 'leakage' for this *increased* likelihood.

9 Nikolai Sokov to me.

10 20-21.3.1997 Joint Statement on Parameters of Future Nuclear Reductions.

11 Allison, Garham T / Owen R. Coté / Richard A. Falkenrath / Stephen Miller (1996): *Avoiding Nuclear Anarchy - Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material*. The MIT Press. Cambridge.

12 *Ibid*, 3.

Another US estimate concludes in June 1997 exactly the opposite:

„'Loose Nukes' - a Myth That Distorts US Policy. Since the Soviet collapse, the United States' public has been bombarded with the 'loose nukes' myth. The myth is that Russian nuclear weapons and materials are leaking to terrorists or rogue states, such as Libya, Iran, Iraq, or North Korea. Despite warnings from the Clinton administration, Sens. Sam Nunn (D) of Georgia and Richard Lugar (R) of Indiana, the Russian government, editorial pages, the Central Intelligence Agency, and a March 1996 General Accounting Office publication report that the "loose nukes" myth is not credible for several reasons:

1. Fissile materials are not leaking from Russia. The myth is that bomb-grade materials - highly enriched uranium or plutonium - are leaking. In fact, there is no evidence of any significant leakage. Contrary to media reports since 1992, low-level radioactive isotopes smuggled into Europe, notably Germany and the Czech Republic, cannot be used for nuclear weapons. Occasional leakages involve such minuscule amounts - fractions of grams, not the kilograms necessary - that building nuclear weapons is technically impossible.
2. Nuclear weapons are not leaking from Russia. Rumors in 1992 that Kazakstan sold two tactical nuclear weapons to Iran have been discredited by US, Russian, Iranian, and Kazak officials. Russia's security and intelligence organizations remain quite large and competent. The real threat to US interests is Russia's sale of nuclear technology to rogue states. This Russian policy is vastly more hazardous than "loose nukes" and continues unabated."¹³

The 'Lebed-ADM-case' in September 1997 again raised the question of the fate of Russian TNWs. Lebed had stated that perhaps 100 atomic demolition munitions (ADMs) might be unaccounted for.¹⁴

Conclusion

This short analysis intended to demonstrate how complicated it is to estimate the Russian TNW-arsenal. The most reliable independent academic and expert sources are counting the number of deployed and active TNWs in the range of 3.000 to 4.500. The 'Lebed-ADM-case' certainly revealed that ADMs are existing in the Russian arsenal, because official Russian sources were instantly denying that one single ADM was missing. The existence of ADMs in the Russian arsenal was assumed, as early as 1989. Then, the Nuclear Weapons Databook, Vol. 4, stated: „There have been reports that the Soviet army possesses land mines, or atomic demolition ammunition (ADMs). These would presumably be used by special forces (Spetsnaz) or KGB detachments behind enemy lines.“¹⁵ As long as the independent arms control circles don't pay more attention to the Russian TNWs, if only with the simple goal of counting and identifying type, location, yield, mission, security systems, delivery system, the two typical myths will

13 William C. Martel, Christian Science Monitor, 16. June 1997

14 The Independent, (UK) 6 September 1997.

15 Cochran, Thomas B. / Arkin, William M. / Norris, Robert S. / Sands, Jeffrey I. (1989): Nuclear Weapons Data Book, Volume IV. Soviet Nuclear Weapons. New York: Harpers and Row, 56.

perhaps proliferate faster than any warhead, relevant fissile material or relevant threat to rogue states: that 'There are absolutely no warheads or nuclear material missing (official Russian version), and that 'These problems apply solely to the Russian nuclear legacy' ('semi-official' US-version). The truth cannot be identified, neither by quoting each other's sources, nor by proliferating these types of convenient myths. Accurate research is needed.

An Assessment of De-Alerting Proposals from a Russian View

by Igor Sutyagin

The mere fact that the Russian Federation is not very much interested in de-alerting of strategic nuclear forces must be the starting point for any discussion of de-alerting measures. This has nothing common with xenophobia or Russia's lack of interest in further nuclear disarmament. The main reason for such an attitude towards an idea currently popular in the West is the obvious absence of concerns about American or any other nuclear postures on the Russian side.

Indeed, with the end of the Cold War it becomes absolutely clear for Russian politicians that the West - even in the sharpest possible scenario - is really not going to sacrifice its well-being and launch a preventive intercontinental strategic nuclear exchange with the Russian Federation. Needless to say Russia does not have plans to carry out such a suicide move either. It could sound like propaganda but the Soviet Union never planned to begin a nuclear war - without being forced to do it. And the only thing which would have forced the USSR to launch its strategic forces was a US nuclear strike.

Due to the "mirror effect" the Communist leaders believed the American Imperialists must hate the historical enemy - the victorious Soviet Communist system - as unconditionally as they did. The advantage on the Communist side was the fact that according to the Leninist theory the Communist system was to win (in historical perspective) and hence did not have to speed up the process. At the same time, the losing Capitalists would have to recognize at some moment the absence of choice to survive as a social system - and undertake the last desperate action, a world-scale nuclear war.

Don't smile at this point, dear reader - this is not a wild fantasy. One should not forget about the KGB's infamous "RYaN" operation ordered by Vladimir Kryuchkov (then-chief of the KGB First Directorate - "Foreign Intelligence") in 1982 to collect clear signs of imminent US preventive strategic nuclear strike against the Soviet Union ("RYaN" stands in Russian for "Nuclear Missile Strike") to provide for timely strategic warning to the Soviet leadership. There were no doubts in the Kremlin at that time that the decision to start a global nuclear war against the Soviet Union had already been made by US leaders and that the precise timing remained the only detail to be determined.

It is instructive that the "RYaN" operation had not been officially cancelled until the dissolution of the Soviet Union and the eventual destruction of the KGB - when there was no one left to cancel it. And even Mikhail Gorbachev - Gorby, "the best German" - did not move a finger during all of his term to stop the nightmarish (while stupid, as one can see today) activity.

In this sense, independent Russia has gained a lot as the result of the dissolution of the Soviet Union: it could drop the painful suspicions about the Western intentions inherited by the late Soviet-time leaders to some extent from the period of the Cold War peak. The time for the "RYaN" operation-like fears has gone - to our great satisfaction - and the Russian political leaders in general have not much concern left for US missiles - de-alerted or not.

This is not the same with Western politicians: it seems sometimes that, not having to survive dramatic changes of self-identification, they along with their countries turned out to be unprepared to live without fears and enemies. When it became clear that the threat of a Soviet nuclear strike was not justifiable anymore, other reasons - possible internal instability in Russia this time - were used to continue to focus on Russian strategic nuclear forces.

Definitely the author does not call to stay calm about the real threat of internal instability in a country full of nuclear weapons. Meanwhile one should not underestimate too much the Russian leaders' - with all their shortcomings - and security analysts' ability to recognize trends and make prognoses. As early as in 1989, the KGB research service predicted dramatic increase of separatist moods in the Soviet republics and suggested the withdrawal of all the most exposed Soviet nuclear weapons - the tactical ones - to the reliable and stable Slav regions. The plan was almost immediately put into life and the withdrawal began in the early 1990s.

The Soviet military-political leadership even ordered in an unprecedented move the disarmament of a regiment of strategic bombers after all nuclear-armed cruise missiles for the Mozdok-based Tu-95MS-6s were withdrawn from the Northern Caucasus to a storage site in a more stable region deep in Russian territory. According to some analyses of Gorbachev's statement, the willingness of the Soviet Union to withdraw her tactical nuclear weapons from combat units to centralized storage sites and to eliminate the essential part of its TacNuc arsenal was to a big extent dictated by the necessity to deal with the separatist threat.

Better or worse, the move was successful enough: two years later the Soviet nuclear weapons turned out to be stationed only in republics ruled by responsible politicians. And this net result is not changed a lot by the fact that some of these politicians - namely the Ukrainian leaders - tried to trade off their responsible approach to the nuclear weapons for additional funds they badly needed to recover their republic's economies from the crisis. After all, the scandals which periodically damaged the Russian-Ukrainian relations in the nuclear field were resolved effectively within the framework of civilized political methods and to mutual satisfaction.

The current situation in Russia is basically the same as it was for the Soviet Union: the political leadership is inclined to responsibly resolve problems related to the Soviet Union's nuclear legacy on their own - when possible - and ask for Western assistance (which is mainly money) - when necessary. In general, the situation is under control today, and the Kremlin does not have urgent needs to further withdraw nuclear weapons from well-defended combat launch positions to the currently over-loaded centralized storage sites which would worsen the safety situation. If need appears, it will most probably be resolved by some sort of unilateral (i.e. independent of everything but Russia's own needs) move. Meanwhile the Russian leaders will definitely try to "catch" the US (and, probably, other nuclear powers') nuclear forces in a situation that allows them to draw some additional advantages from their own, in any case inevitable self-restrictions.

It seems to the author to be quite clear that Russia does not have today urgent needs in additional confidence-building or/and stability-enhancement measures - and due to this reason it is very much not interested in the de-alerting business. Hence almost all actions that could be undertaken by Russia in this field are mainly related to the necessity to prevent a complete stall of the nuclear disarmament process (after all, this is Russia's obligation under the Non-Proliferation Treaty) or of Russia's readiness to contribute to the resolution of concerns which still exist on the American (and, in general, the Western) side.

Therefore one can draw from the above analysis some basic conclusions on possible Russian attitudes to probable proposals on de-alerting of nuclear forces and other confidence-building measures. To be affordable for the Russian side, such proposals, first of all, have to be cheap enough to be put into life. Hence the idea of complete (or even very considerable) withdrawal of nuclear warheads from their strategic delivery vehicles, which means for the currently overloaded and underfunded centralized storages of the 12th Main Directorate a worsening of the safety situation, because, in current conditions, weapons on missiles are safer than in centralized storages, does not have a chance to be realized. Indeed, this step will be too costly for Russia in both direct and, possibly, indirect sense to be accepted as a "good-will step" while not meeting current Russian needs.

The second important point is that de-alerting proposals have to be well-balanced and reciprocal: the set of proposals that was listed by Sam Nunn and Bruce Blair in the "Washington Post" this June (Nunn, Sam, Blair, Bruce: From Nuclear Deterrence to Mutual Security. As Russia's Arsenal Crumbles, It's Time to Act /The Washington Post, June 23, 1997, pp. 21-22.) in the best case will be rejected as irrelevant. In the worst case, it could undermine Russian confidence in the responsibility of American attitudes and thus lead to quite the opposite result: additional misunderstandings and increased tensions instead of better mutual confidence and increased stability.