**International Security**
**Nonproliferation**
**Arms Control**

## DIGEST OF THE RUSSIAN JOURNAL

# YADERNY KONTROL

## (NUCLEAR CONTROL)

## № 10

Spring 1999

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# Contents

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## International Security. Nonproliferation. Arms Control.

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**Address**: P.O. Box 17, Moscow, 117454, Russia
**Phone**: +7+095-335-1955
**Fax:** +7+503-234-9558
**E-mail:** info@pircenter.org
**Internet:** http://www.pircenter.org

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## Hot Topic

# UNIFIED SUPREME COMMAND OF STRATEGIC DETERRENCE FORCES IS A SOURCE OF CONTRADICTIONS IN THE MINISTRY OF DEFENSE

**by Dmitry Litovkin,**
**PIR Staff Writer**


*Translation into English. Abridged version*

Due to objective and subjective political reasons - above all, a lack of finances and the political will to enhance combat capability and readiness of sub-divisions and units - military reform within the Russian Armed Forces primarily followed a path of restructuring the chain of command, inherently posing the danger of a number of contradictions within the leadership of the Ministry of Defense.

In late 1998 a serious scandal took place within the Ministry of Defense. In which Defense Minister Marshal Igor Sergeyev got President and Commander-in-Chief Boris Yeltsin to sign a document establishing the Unified Supreme Command of Strategic Deterrence Forces in 1999. As has been established, Sergeyev got the presidential stamp of approval on such a serious document by circumventing procedures required in such circumstances. It should have been first discussed by the Board of the Russian MOD, submitted for consideration by Chief of the General Staff General of the Army (GA) Anatoly Kvashnin, and studied at a meeting of the Security Council. Sergeyev also managed to avoid what would seem to be reasonable consultations with Prime Minister Yevgeny Primakov. Sergeyev's use of such a sophisticated bureaucratic trick apparently stemmed from two premises: first, the high degree of preoccupation with economic matters by a large part of political elite which made structural changes in the MOD appear of little importance in comparison; second, Sergeyev's close relationship with the President and the latter's obvious inability and unwillingness to make any changes in the MOD leadership.

Apparently, both conclusions were not entirely correct and didn't allow for the growing legislative interest in national security issues and for the relative weakness of structures of the presidential administration after apparently *losing face* in connection with their inability to influence US policy towards Iraq and Serbia. As a result, the scandal involving arbitrary changes in the system of strategic forces command and control spilt in the press, where proponents and opponents of the idea of unified command publicly accused each other of destroying the coherent system of Russian nuclear security.

Marshal Igor Sergeyev's plan called for setting up a single structure for Russian nuclear forces during the course of 1999 from the Strategic Missile Forces, nuclear components of the Navy, Strategic Air Force units, and the 12th GUMO (the Main Directorate of the MOD in charge of all nuclear munitions of the Armed Forces). According to the minister's plan, the new body should be headed by the current Commander-in-Chief of the Strategic Missile Forces, Colonel-General Vladimir Yakovlev, who would be promoted to First Deputy Defense Minister/Commander-in-Chief of the Strategic Deterrence Forces as part of his new duties and as a result become one of the main contenders for the position of Defense Minister. This tactical move would also sharply strengthen the position of Igor Sergeyev in his rivalry with the Chief of the General Staff, General Anatoly Kvashnin.

In suggesting the creation of the Strategic Deterrence Forces, Igor Sergeyev leaned on materials developed during the Soviet era. In 1991 the Chief of the General Staff received a proposal envisaging unification of all branches in charge of the use of nuclear weapons and the establishment of a single command. A similar structure had already been set up in the USA by that time. However, the idea was put off. In the first place, the problem of merging such diverse branches of the Armed Forces was very complicated and contained a number of organizational and bureaucratic difficulties. Secondly, interest in the

military sphere was relatively small in political circles, resulting in a vulgar understanding of the idea of an absolute diminishing of the military and, in particular, strategic nuclear threat for the USSR, which was reiterated in an even more exaggerated manner by the Russian political establishment. Moreover, on a purely bureaucratic level the General Staff leadership already understood perfectly well that in the process of merging the nuclear triad they could lose one of their most serious peacetime missions, i.e., planning for the use of the nuclear weapons. That would diminish their strategic importance in the view of political leaders and indirectly deprive them of the opportunity to contend for the post of Defense Minister. So consideration and implementation of the document were postponed, calling the concept of the creation of a unified command premature and incomplete.

Igor Sergeyev's interest in the given project is explained by two basic motivations. One of them is rather banal. The Defense Minister has fulfilled the established term for military service and must retire in 1999 due to age requirements. In this situation he needs a successor able to secure him suitable retirement (pension and privileges, dacha and personal automobile at the state expense, access to military resorts and hospitals). What's more, this successor should shield his predecessor from possible accusations in case of detailed examination of mistakes made in the course of military reform, which in fact was started by Igor Sergeyev. This is extremely important for the minister, since his measures permanently affected the interests of such influential groups as the Air Force and the Army and offended many who could seek revenge after his retirement.

The only successor for the minister could be Vladimir Yakovlev, who replaced Sergeyev as Commander-in-Chief of the SMF. This is quite natural since both officers have been making military career together, and Yakovlev has always been replacing Sergeyev at command positions, starting at the division level. It is clear that it would be advantageous for Igor Sergeyev to have a well-known and predictable person as his replacement.

The second reason why Sergeyev insists on unification is more serious and is connected with principles of national security. The thing is that all Armed Services of the Armed Forces cannot survive under the present level of financing. To put it simply, the largest share of the Department of Defense budget will go to that service from which the new minister comes. Yevgeny Shaposhnikov ensured the prosperity of the Air Force, Pavel Grachev - the airborne troops, and Igor Sergeyev - the Strategic Missile Forces. Theoretically, the project of a unified command set forth by Sergeyev should put an end to this sort of perverted bureaucratic *nepotism* and regulate the allocation of budgetary funding on developing all components of the nuclear triad within the framework of a coherent state policy. Nevertheless, in certain circumstances (depending on the specific implementation process) the plan may lead to simple legalization of existing lobbying of local departmental interests.

That is why the project did not raise too many objections or questions by Naval and Air Force chiefs since establishing the unified command will not mean limiting their command and control functions over the naval and air forces but only shifting responsibility for planning and employing nuclear weapons on the Supreme Staff of the Unified Command, an idea to which the General Staff and the 12th GUMO strongly object.

The General Staff's problem lies in the fact that taking away its primary peacetime function - the planning for the use of nuclear weapons - sharply decreases the status of its leadership. It is clear that General Kvashnin intended on becoming Defense Minister after Sergeyev's retirement. But if the plan for the unified command is realized, the General Staff will only control ground, naval and air forces that have been seriously weakened without strategic missiles and military and paramilitary units of other agencies like the Ministry of Emergency, the Ministry of Interior and the Frontier Guard. Although in this case the Chief of the General Staff will not lose hope of getting the ministerial post, his chances will depend mostly on enhancing combat capabilities and readiness of conventional forces (mainly, the ground forces) and succeeding in forming new large units. Obviously we cannot expect any major breakthrough in this area given the background of insufficient funding for the Armed

Forces and the top priority given to social benefits for servicemen and women.

There is one more person who is displeased with coming changes. It is First Deputy Defense Minister Nikolai Mikhailov, a civilian in charge of coordinating defense contracts. Nowadays the state budget provides only for funds to produce the Topol-M ballistic missile system for the SMF. And if Mikhailov loses influence in this area his role in the MOD naturally comes into question.

However, despite the lack of an appropriate decree by the Commander-in-Chief (i.e. Boris Yeltsin), first steps reportedly will be taken to establish the unified command in 1999 - the 12th GUMO will move from downtown Moscow to the suburbs. Assignment of the nuclear components of the Navy and the Air Force to the unified command is postponed until the completion of a detailed study of their possible mission within the new structure and until an appropriate Presidential Decree initiating the budgetary financing of the next stage of military reform.

According to officials of the SMF Supreme Staff, merging all land-, air- and sea-launched nuclear missiles, their warheads and nuclear munitions, as well as the development, maintenance and control of nuclear weapons, and establishing the Unified Command of the Strategic Deterrence Forces will enhance the combat potential of the country. If at present we do not have adequate financial means for reform and cannot provide for the maintenance costs of the Armed Forces on the whole, then we should focus in one major direction. Nowadays the SMF is the only Armed Service that ensures effective protection against aggression while remaining an instrument of political influence.

In 1997 on the basis of the SMF the first stage of establishing the would-be command was carried out. A unified command was set up for the SMF, the Aerospace Forces, and the System of Space Defense and Early Warning of Missile Attack. This single measure decreased the maintenance costs of the missile forces from 19.5% to 15% of the defense budget. In 1998 the MOD got 30 billion rubles, four billion of which were allocated to the SMF. The SMF managed to find some money for launching a number of new satellites for the early warning system. Thanks to these satellites, capabilities were enhanced so that the time of *blindness* in which the system could not track the launch and the flight of ballistic missiles of some states (South Korea in particular) was decreased from nearly eight hours to just several hours. The money was also enough to carry out tests and to commission 10 Topol-M ballistic missiles. This regiment will become the backbone of the Russian strategic deterrence forces in the next century.

The decision to develop a new ballistic missile for use by both the Navy and the Army is being fulfilled within the framework of the strategic deterrence forces unification as well. This approach will enable the MOD to cut down spending on research and development of new equipment. According to some estimates, concentration of all research and development programs on land-, sea- and air-based equipment and weapon systems in a single research center will economize not less than 25% of today's costs.

Operational costs of the Unified Command of the SDF will be even lower. If the 12th GUMO withdraws from the General Staff and is assigned to the Unified Command, the structure will be streamlined and some superfluous command and control bodies will be eliminated - i.e. about 1,600 established posts, 1,300 of which are taken by commissioned officers and generals. Thus, about 27 million rubles will be saved per year. If we add to it reduced expenditures on transport, free and ready-to-use buildings and other infrastructure, this figure will amount to 200 million rubles. It will not be necessary to set up a new system of command and control over strategic submarines and bombers. It already exists in the SMF structure. Moreover, if any difficulties of organizational character arise, they can be solved by attaching officers of the Naval and Strategic Air Force Command Posts to the General Command Post of the Unified Command of the SDF to ensure interaction and coordination of activities of the nuclear triad.

There is a problem with the missions of the unified command, or let's say its *manifest destiny*. First, despite all political declarations about the importance of tactical nuclear weapons for containing NATO superiority in conventional arms, the core of the MOD strategy continues to be strategic nuclear deterrence (which can be used only against

the USA and China). As a result, there is a lesser chance of resorting to the limited use of nuclear weapons. Secondly, the MOD leadership at different levels attaches too much importance to the development and financing of this very sector of military construction. Therefore, *de facto* the MOD still bases its military planning on the expectation of global conflict, though under new doctrine its primary task is to be able to counteract the menace of regional and local conflicts.

However, after Boris Yeltsin returned from Barvikha, where he had been receiving medical treatment for stomach ulcer, the argument between generals got its logical progression. President Yeltsin signed a decree establishing the commission that would study the problem of setting up the SDF Unified Supreme Command. Naturally, it is Marshal Igor Sergeyev who will head this advisory board. Of course, that does not mean that a final decision has been made. But bearing in mind Sergeyev's interest in taking the first step toward establishing the unified command this very year, we can presume that the Marshal's plans will be realized even though the defense budget for 1999 does not provide for expenditures on that. According to our information sources in the State Duma, at present the military is doing its best to convince the legislature on the necessity of financing such a measure important to the cause of military reform. And in accordance with assessments of the Duma experts, the military has a great chance of success.

At the same time it may happen that the current internal struggle for bureaucratic power within the MOD will only theoretically influence the race for the ministerial post. Obviously, if the President leaves office (either prior to or following the completion of the constitutional term of office), most of the commitments made previously will make no sense. Moreover, there is a chance for the Armed Forces to carry out their principal duties and to have lesser impact on domestic politics due to aggravation of the national security situation (US enforcement actions, instability in Chechnya, NATO expansion to the east). Under these circumstances there will be a need for changes in the ministerial staff that may *close the door* to the post of Defense Minister on the current contenders, who have become accustomed to working in the rather peaceful conditions of the transitional period.

## PIR Center News

### Spring 1999

**1999, February 18.** PIR Center organized a meeting with Ambassador of Israel Mr. Magen on "*Israeli View on the Middle East Security Agenda*". It was held within the framework of the regular PIR Center Research Council meetings. Besides Ambassador Magen, Embassy Counselor Mrs. Naomi Ben-Ami and 1st Secretary Mr. Oded Jozeph attended the meeting.

The informal talk covered the following matters:

- Security in the Middle East and Israeli view of it;
- Confidence-building measures in the Middle East;
- Ways to maintain the dialogue on military-political issues with the Arab side;
- Israeli position on creating a nuclear-weapon-free zone in the Middle East.

The meeting was held in off-record mode.

* * *

**1999, February 25.** PIR Center held the Conference "*Export Control in Russia: Legislation and Practice*" in the framework of Educational program on arms control and nonproliferation for the legislators and staff of the State Duma. The representatives of the State Duma and Council of Federation, the Ministry of Foreign Affairs, the Ministry of Atomic Energy, the Ministry of Trade, the State Customs Committee, the Currency and Export Control Service, and other institutions took part in the discussion.

Ambassador Nikolai Uspensky, Chief, Department of International Affairs of the Security Council Administration, made a report on "*Export Controls as a Key Element of Russian National Security*". Mr. Uspensky dwelled on the measures taken by the Russian Federation to improve export control mechanisms and touched upon the export control agenda of the Gore-Primakov Commission and the ways it was discussed at the international negotiations. Amb. Uspensky emphasized the importance of

legal acts of the Russian Government in the export controls area, aimed at fulfilling Russian commitments to the world community. He pointed out that proper system of control over dual-use goods and technologies would open foreign markets for the Russian producers and would strengthen confidence in our financial institutions and the Government as such.

Lieutenant-General Gennady Evstavief, who is a member of the Export Control Commission of the Russian Government, spoke on "*Actual Problems of Export Controls*". He argued that earlier Russia had made many concessions to the USA in export control issues. Those commitments should be adjusted in the light of the current situation. Lt.-Gen. Evstafiev stated that we should not reduce nonproliferation to export controls only since the latter would be unable to solve all the problems of the former. He also emphasized that Russia had practically no mechanism of sanctions against companies, violating the export control regime. However, he pointed out that law-enforcement activities in this area should be combined with encouraging those who fulfilled in good faith the provisions of export control regime, for instance, through a simplified procedure of customs registration and getting license.

Deputy Svetlana Gvozdeva and the State Duma representative Vladimir Misyuchenko told the conference about progress of the Bill "*On Export Controls*". According to them, many deputies back the Bill on the whole and the situation in general is quite favorable.

PIR Center Research Fellow Alexei Rey presented his work "*Sensitive Export and Export Controls in Russia*", published in the Study Papers of the PIR Center. The report is based on a considerable amount of statistical and other data and it is one of the first attempts to give a systematic analysis of such insufficiently explored topic for Russia as sensitive export.

Representatives of the State Duma, various ministries and agencies took part in the discussion that followed the reports.

## Summary

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The *Editorial* entitled "*Concept of Strategic Triangle in Asia: Result of Foreign Policy Illusions*" says that 'one of the most prominent initiatives of the Russian Federation in 1998 was the proposal to set up the strategic triangle: Russia, India, China. To understand the true meaning of this statement we must first question the possibility of such alliance. India and China as Russian partners? But the military of both countries regard each other as potential enemies.

The problem is different: is the alliance with Russia so attractive to reconcile the rivals, or at least to reduce mutual hostility? The practice shows that this initiative has failed to get positive response from would-be partners. The ruling political elite surely understands that Russia is a weak country and it has no military capabilities to attain its goals and prove its foreign policy ambitions. And the might Russia possesses is regarded by many experts as inadequate for the current situation in the world.

It may happen that the aforesaid move was merely tactical, while all talks about strategic alliance or partnership were not more than a glow to increase the effect of the measure.

Russia can't form any full-fledged strategic alliance: taking into account its extreme weakness it won't be able to claim for leading positions in such coalition with a large country. Any attempts to set up such alliance may result in foreign policy or even economic dependence. At present, it's equal partner is Byelorussia. Here it may take a lead and get foreign policy benefits. Byelorussian unwillingness to become the Western client after the collapse of the Soviet Union is a tremendous luck for the Russian foreign policy makers.

The process of setting a new balance of power in Asia is under way. We must take into account the intensifying contacts between India and Pakistan, exploring the ground for improving Indian relationship

with China. These measures are of bilateral character and are taken by the regional powers and the USA as well. The later has started to pursue a new engagement policy towards India which is far from the language of sanctions. We have to admit that Russia is supposed to play a more modest role in this initiative than it was planned by Yevgeny Primakov.'

First Deputy Minister of Atomic Energy Victor Mikhailov in his article "*Ministry of Atomic Energy and International Cooperation*" argues that 'nowadays the main objective is not only to preserve export potential of the industry but to increase it. By 2000 we planned to increase the share of our export production up to 50% of industrial output. I'm sure that the Minatom facilities will fulfil this task. Naturally, it is possible only if we preserve Minatom itself, don't split it into small independent enterprises, which now serve as our exporters. We should secure the consolidation of export as the basis for maintaining technological ties between our enterprises and scientific, research and development centers. Otherwise we will quickly dissipate the six-year experience of export and slow down the growth rate. Hence, we'll be unable to keep the pace and use the potential of new technological achievements of the industry.'

Vladimir Zakharov, Senior Research Associate of the Russian Institute for Strategic Studies, in his article "*Factors, Affecting the Russian Defense Doctrine*" says, 'After collapse of the USSR, 40% of strategic nuclear forces found themselves in operational and tactical depth of defense in possible areas of operations. In this circumstances attack of any country or group of neighboring countries (NATO member states or would-be members of the Alliance) will inevitably lead to destruction of some units of the Russian strategic nuclear forces, even if there is a mutual willingness to refrain from strikes against nuclear facilities. Here comes the question: would it give cause for Russia to use nuclear weapons?

In February 1997 Russia, reportedly, declared that it didn't rule out the possibility of preventive nuclear strike. However, these statements were later harshly criticized by the country's leadership. In this connection we can witness the problem of decision-making, when it comes to the employment of nuclear weapons. This problem results from the difficulties in foreseeing possible consequences of the planned actions, and specific importance of psychological factors.'

## Viewpoint

# POLICIES AND NEW TECHNOLOGIES: ROLE IN THE 21st CENTURY

**by Alexander Yakovenko,**
**Deputy Head,**
**Permanent Mission of the Russian Federation to the International Organizations in Vienna**

**[This article was originally published in Russian in *Yaderny Kontrol*, No. 2, March-April, 1999]**


The world today is undergoing unprecedented changes in terms of their scope and speed. Experts have noted that at the present time during the lifetime of one generation approximately four technological revolutions take place.

The international scientific and technical progress of recent years has given mankind a new qualitative status. Production is radically changing, and following it are several other areas of human activity. Knowledge, its accumulation, dissemination, and practical application are becoming a determining factor. Scientists share the opinion that human civilization is entering a qualitatively new and higher stage of its development. Some people call it the era of knowledge, thus stressing the role which science and its achievements are called upon to play in the evolution of mankind. The transition to this stage, also called the post-industrial era, entails a considerable number of changes of political and social nature.

The dynamically developing economy based on new technologies, first and foremost on electronics and communications, is becoming one of the main sources of influence in the world. Countries that export mostly products of human intellect, come out on top. However, as new materials and new sources of energy are emerging, the significance of countries whose well-being and position in

the world was based for many years on their role in the production of raw material and use of traditional sources of energy is decreasing. It is noteworthy that Bill Gates, whose fortune is based on a product of human intellect and computer programs, is at the top of the list of the world's wealthiest people.

The use of advanced scientific achievements has safely resolved the problem of food for industrial and some developing countries.

In fact, a new stage has begun in the socialization of production on a global scale. The capital and financial flows have also acquired a global character. Transnational corporations and international institutions, whose decisions exert a determining influence on the flows of money and goods and production, have appeared on the scene as new actors.

The trend towards interaction of economic mechanisms and integration at regional and intercontinental levels is gaining momentum. The exchange of technological knowledge, export of capital and cooperative ties of enterprises and transnational corporations constitute the material basis for interdependence in the modern world. The world economy in its main aspects is acquiring the character of a single organism.

The need to use knowledge as a direct productive force comes up as never before with absolutely new requirements to the quality of labor force, living conditions, education, labor force reproduction and conditions of its integration with the tools of production.

A person whose main productive force is the intellect *cannot but be free*. Therefore, this phenomenon has become precisely the basic cell of social mechanism which gives rise to one of the determining trends of modern times. The authoritarian approach becomes a counterproductive form of existence. However, the information society can generate a serious threat to human rights. Complete information on any person at work and at home and on the movement of income makes life so transparent that the access to information and its use can become a powerful lever of influence on practically every person.

As a result of rapid changes of revolutionary character, the foundations have been laid during this century for rethinking traditional perceptions of the ways to ensure in the most efficient security of states. The role of political means has increased with appropriate relative reduction of military and technical factors.

However, the drastically increased volume of human activity has brought the environmental problems to a critical level. A real threat has emerged to the natural reproductive capacity of the environment at local and regional levels. If this threat is not duly recognized and removed it may acquire a global character. Nevertheless, even without speaking about the possibility of the environmental collapse of the planet, the tension at the regional level is such that environmental problems may become a source of international conflicts in the foreseeable future.

The involvement of large populations in political life has different implications for countries at different stages of development. Together with the movement for progress, the social and spiritual aspirations of the population acquire the form of national demands, especially where material conditions are not sufficient, and turn into religious movements in the backward countries. This is a new factor, and it seems that it will persist and probably grow for several decades.

By the end of the 20th century the political mosaic of the world is undergoing sweeping changes. A multipolar arrangement of the world has substituted the bipolar system. Two new centers - Japan and Western Europe - have emerged among the industrial countries. The leading group of industrial countries of the West is rapidly increasing its economic and financial strength, and political influence in the world based on advanced scientific and technical achievements. With the end of the Cold War the motivation of Western solidarity that was formed during the confrontation has disappeared, which leads to more obvious manifestations of

political and economic contradictions among developed countries.

The West is ceasing to be a military and political notion in the sense of traditional power, but remains one of the most important centers of the global economy, international relations and the global civilization process.

The struggle between the policentrism of global policies (United States, Western Europe, Japan, and states claiming the role of regional centers) and the desire of the United States to maintain its leadership will be one of characteristic features of the political picture of the 21st century.

The problems experienced by the countries of Central and Eastern Europe, first of all in the economic area, may become a source for the revival of nationalism and social upheavals. The difficult process of seeking a new political identity has been mainly completed by the end of the 20th century. Together with the prevailing pro-Western trend and the desire to obtain guarantees of security and join the West European integration arrangements as a full-fledged participant, the tendency towards renewal of relations with Russia on a new basis will increase. It should be noted that breaking with Russia, especially in the economic area, will play a negative role for quite a long time.

New industrial countries have emerged in the Third World. It looks as if two simultaneous processes are taking place that go in opposite directions, i.e. the number of decision-making centers is multiplying in parallel with the integration process, which is accompanied by attempts to develop common policies among the nations on the basis of regional, political, and even religious principles.

The G-8, the group of leading countries whose leaders are developing quite efficiently their common approaches to the management of fundamental issues of policies, is occupying a certain place among the numerous groups.

At the same time many countries of Africa and Latin America have found themselves unable to take steps toward modern society, a development that was long impeded by the legacy of colonial past, undeveloped systems, lack of professionals, the growing burden of foreign debt, and involvement in destructive conflicts.

The Third World, with its deep socio-economic, national, and civilizational problems, is becoming the main source of global and regional threats for the first decades of the 21st century. The risk of regional conflicts, the arms race, including the attempts of a number of countries to get access to weapons of mass destruction and their means of delivery, outbursts of social and ethnic strife, terrorism, drug dealing, hunger and epidemics are threats of a global character and will dominate the agenda of the next century.

The sharp decline of industrial output, growing instability and a painful period of transition to a market economy are observed on the vast territory of the former Soviet Union.

The polarization of a certain kind, i.e. the establishment of global center and global periphery, is one of the results of the 20th century. The gap between them is growing practically by all indicators.

This quite schematic description of factors that determine the outlook of the modern world leads to two conclusions that seem to be extremely important for analysis.

First of all, the developed countries that have entered the post-industrial period are at the stage of transition to such a form of civilization where non-violent resolution of emerging contradictions is becoming both an objective possibility and an objective requirement due to their interaction and interdependence.

Secondly, the developing countries, the world periphery and the countries in transition are still undergoing and probably will have to undergo for quite a while a period in which contradictions will persist and entail crises, which may turn into conflicts and wars.

In this respect, there is a quite interesting assessment of the world after the end of the Cold War by Professor S. Hoffman of Harvard University. From a structural point of view, i.e. from the viewpoint of distribution of possibilities, this world will be a multipolar world. However, the centers of power will differ by the means of securing their strength: Each will use its own currency: Russia - the military, Japan and Germany - economy, China and India - demography, the United States - the military and economy, and they all will have different weights.

The fate of this new world will depend on the ability of the centers of power to ensure a sufficient degree of cooperation to prevent or attenuate conflicts, including regional ones, and to settle the crises that may emerge in the world economy.

There is also another dimension of interstate relations that symbolizes the realities of the end of the 20th century. This is the dimension of interdependence. Since the time of ancient Greece, power was understood as military and economic strength. However, modern problems such as the greenhouse effect cannot be resolved by classical methods and means. As a rule, the potential of one state alone - even the most powerful - clearly is not sufficient. This leads to an important task, which is to learn how to manipulate interdependence, to use and transform the structure of international systems for one's own goals.

Under these circumstances the development of a realistic understanding of the limits of one's own possibilities is an important element in the concept of national security for the states. It determines the limits of opportunities for diplomacy as an instrument of national policy. As a rule, they should correspond optimally to the real capacity to exert a decisive influence on the course of events.

The question is how to measure power in a changing world. There is an interesting point of view that the greatest mistake throughout the centuries was the attempt to determine one or two indicators for its measurement.

The evidence of power is not the possession of resources, but the capacity to change one's behavior. Quite often the winner is not the one who began the game with many stakes. Therefore, the most important issue of the future is not whether, for example, the United States or Russia will enter the next century as superpowers with the greatest number of stakes, but to what degree will they be able to control their environment and achieve their goals. In other words, the game becomes increasingly complex with a wider sphere of goals and a greater number of players. However, scientific and technical progress, with all its implications, will remain the focus of all efforts.

Two hundred years ago, the world witnessed the first technological revolution. The power of steam found its application in transport and industrial production.

One hundred years ago, the second technological revolution took place. It was associated with the advent of electricity and development of chemistry which, for the first time, allowed mankind to start production of synthetic products.

Mr. Bell, the author of *The Advancement of Post-Industrial Society*, believes that by the year 2013, the third technological revolution will occur.

One can argue about the precise date of the beginning of the next technological revolution, which is called more often the information revolution. However, it is difficult to deny the fact that the developed countries have almost reached that level.

In fact, we are dealing with a qualitative leap in the development of production forces when the application of computer techniques of storage, processing and transfer of information in all spheres of human activity will ensure a drastic increase of the efficiency of labor.

Today, one can speak about the accumulation of quantitative indicators of science and production that are gradually leading us to a qualitative breakthrough.

Although the revolution in information and technology and the conceptual

understanding of its implications for the life of human civilization and international relations are still at their initial stage, we can already state with certainty that this is an issue of a major qualitative leap in the development of productive forces. It may change all our basic perceptions of the future development of mankind and, thus, our policies.

The conditions and possibilities have been created in the area of real development of economies of the countries that have mastered the information technologies for achieving abundance in the production of material wealth and ensuring traditional spiritual values in the next century.

Comprehensive automation and robotization of industrial and agricultural production combined with optimum technology choice will in the future allow resolution of any problem of satisfying human needs.

Such problems as the use of hydrogen as fuel, desalination of sea water, production of synthetic food products, synthesis of efficient substances for treating cancer, development and utilization of material and power resources of outer space are mentioned in scientific publications as problems to which solutions may be realistically achieved in the next 15-20 years.

Problems of the artificial extension of the lifetime of the human species and the creation of man-identical biological artifacts are considered to be solvable in principle in the more distant future. The first experiments with so-called cloning confirm such a possibility.

Therefore, we are dealing with the total disappearance of material limitations to human existence and, thus, the emergence on this basis of a new form of the movement of matter whose main subjective motive will be the cognition of the world we live in.

The abundance of mass consumption products as well as information technologies in the management of industrial and social processes will exert a constant pressure on policies, as means of power struggle, so as to move them from the limits of national societies to the area of interethnic and international relations, and within national societies to upper echelons of social structures.

The content of political struggle will be determined by the choice of priorities and goals of that or another social group or society as a whole. In due course of time, free and rapid access to the most wide and complete banks of reliable information, as well as the possession of expert potential for competent and qualified assessment of information received, will become the main object of struggle as well as the attribute of political power.

A relatively small elites will emerge as actual possessors of real political power in the societies saturated with information technologies. It can be stated already that there is an emerging trend of establishing these elites from leading representatives of financial capital and scientific community. The importance of services, crafts, and individual creative activity is increasing. The reliance on the information sphere, or the network of computer telecommunications that would connect the producers with data banks, with each other and with consumers will become the main feature of all professions.

Serious changes in the area of education will also take place. During the industrial era, specialization was the most important element of production. A technical specialist was not simply a technical worker, but an employee with deep specialization who knew practically everything in a narrow technological area. In the era of the information and technological revolution, many special skills will be better managed by computers and robots. A wider knowledge that would allow the person to combine knowledge with information will be required instead. All this will lead to a radical rethinking of the system of education and its adaptation to a society where information rather then industrial technologies will dominate.

The last two centuries quite often generated ideologies of extreme political character. In many respects, this was due to the fact that

socialism and capitalism became the product and result of industrial technology and, accordingly, the relations of production that characterized that society.

With the advent of new technology, new conditions are also emerging. The importance of knowledge as a factor of production consists in the fact that it is not fully identical to the process of production, which provides a new dimension in the relations of production.

The safeguarding of human rights and civil liberties will be even more focused on accessibility of information, education, and issues of professional training and retraining. The protection against the invasion of privacy will be of particular importance for the protection of human rights of citizens.

A qualitative leap in the technological development of civilization along with its positive results is reflected also in the number of negative aspects.

A general theoretic and probabilistic analysis of these aspects leads some scientists to believe that a time of existence of technologically developed civilization objectively cannot last for too long. One can expect no later than the year 2030 a disruption of the gigantic manmade information technosphere due to the exacerbation of that or another global problem. From this viewpoint, the greatest danger for mankind is represented by the problems whose social and material origins have not been studied and therefore are not subject to control.

Hypothetically, one can assume in particular that the experimental failure in the area of genetic and molecular engineering could provoke an explosive proliferation of some contagious viruses before any substances to neutralize its effects will be created.

Among Soviet scientists this hypothesis of short-term technological development of civilization was shared by astrophysicist I.S. Shkolovsky who stressed, however, that a constructive social and political program could be opposed to astronological determinism to define the destiny of civilization.

The influence on the life of society of the above-mentioned tendencies of information technologies will most probably be reflected in the international relations in an acute politicized form. The threat of manmade self-destruction is perceived, in particular, not in the form of an abstract theoretical probabilistic model, but rather as a specific risk that will grow as the system of adoption and enforcement of military and political decisions will be saturated with computer means. This is a political reality without a precedent in the world history. Objectively, it gives an impetus to international cooperation for the prevention of nuclear war, protection of technological and environmental sphere, and the solution of other global problems.

At the same time, the information technologies create a material basis for an interdependent and unique world by promoting the development of international cooperation in the political and economic areas. In the future, this will constitute a basis for the establishment of a mechanism of management of the integrated world community. The old political system of the world, the main element of which is the nation-state, will impede the full use of the potential of such cooperation.

Ironically, the national state is a twin of the industrial society. Industrial technology and the large national entity are two sides of the same coin, since the industrial society can function only on the basis of a definite form of collectivism or, in particular, a major state sector.

The spurt in the industrial development of Russia in the beginning of the 20th century was based mainly on the concentration of tremendous physical efforts of the population of the country on the production of steel, rolled metal, iron, which at that time were the key indicators of the economic development. Socialist realism in art became a kind of a symbol of that time. How radically the situation had to change by the end of the century when quantitative indicators have given way to quality factors.

Information technology eliminates most of the above-mentioned limitations. As a result, from the viewpoint of production, the need for a nation-state in its traditional perception is decreasing.

Probably, one can agree with the idea that the classical nation-state is too big to address many of the problems of tomorrow that can be resolved more efficiently at a regional level. At the same time, it is too small to address other issues that require an international format.

The sovereignty that was historically established as a legal means of collective protection of interests of civil society, including human rights and liberties, is transforming into its antithesis, since under the conditions of scientific and technological revolution it can be easily turned into a protective roof for the activity of political gamblers. Making a fetish of national sovereignty can, in the final analysis, lead to infringement of the most basic human right, i.e. the right to live.

Everywhere, the leaders of states have recognized that a sound economy is not only a critically important condition of internal stability and external influence. As never before in history, the rapid growth of economic interdependence has brought together domestic and foreign policies. Domestic policy both in its economic and political dimension exerts a direct influence on other countries and therefore is a subject of greater legitimate attention than it was in the past.

Issues of interdependence are becoming extremely complex. For example in Asia, the economic areas often transcend the political borders. At times they are the result of government policy. On another occasions they are the result of efforts and initiatives of the private sector. However, basically, they are the result of the combination of the first and the second factors. In any case, they become substantial elements both in economic and political terms.

In parallel with the growth of manageability of the modern world and strengthening of its integrative trends and establishment of national political and technological elites the process of establishment of quite limited world elite is beginning from the number of the most prominent representatives of national elites and transnational corporations. One cannot exclude that this tendency, in the absence of necessary control, can in the future lead to a *technological dictatorship* over the world by certain ruling circles under a plausible pretext of the struggle for the preservation of life on Earth, for example.

In the foreseeable future, interstate relations will develop under a sign of contradiction between objective common interest in survival and the need to counteract the desire to establish technological hegemony of any kind over the world. Under these circumstances it is extremely important for the success of foreign policy of every state to possess one's own potential of high technologies as well as diversified system of diplomatic relations with other states in all areas.

The most efficient guarantees against the destabilizing impact of computer systems on the political situation in the world are provided by the international cooperation with the use of information technologies for the maintenance of international stability. Moreover, the prevention of information terrorism will become one of the most important elements of international cooperation. Information technologies will become the focus of attention of international law scholars. A new area of activity, information law, will emerge. Some of its elements have been already incorporated in the space law. It will take less than a decade for the development of an international convention on the prevention of hostile influence on global and national information resources, on the prevention of incidents of information character, and the repression of information terrorism.

The revolution of information has a complex and contradictory impact on the relations among different economic centers of the world. The general strengthening of the global integrated economy is accompanied by the increasing competition among

individual transnational corporations and national monopolies.

In its competition with Japan, the United States is moving much faster in the areas of information technologies and computer science, where the maximum scientific and intellectual inputs as well as capital are required. At the same time, the gap between Western Europe and Japan is growing to the advantage of the latter. However, the strengthening of the US technological domination among the seven leading capitalist countries is compensated to a certain degree by integration processes in the world capitalist economy and the participation of Japanese and West European monopolies in the share of profits of the United States and transnational corporations.

In the future the settlement of contradictions that are the result of uneven development of individual centers under the conditions of information revolution will be achieved spontaneously by complex integration of the capitalist world economy and the establishment of a unified international political elite of modern Western civilization.

Generally, the information revolution destabilizes the relationships between the leading centers of power. The sudden breakthroughs by individual monopolies and scientific centers can substantially modify the configuration of relations within the group of developed countries and contribute to the establishment of the new and the reduction of influence of the old sources of political influence.

The information revolution by itself is not conducive to equivalent exchange and does not preclude the growth of indebtedness in the relations between the developed capitalist countries and developing countries. Moreover, for the next 10-15 years one can expect the conservation of unequal exchange and the increase of the gap between the rich North and the poor South.

Partially, this imbalance will grow as a result of the outflow of intellectual politically active elite from Third World countries to the international organizations, transnational corporations and private companies of the industrial countries. There is a possibility that the so-called problem of North-South relations will become more serious and turn into one of the most acute problems of the future world order under the influence of the world technological revolution. This will be contributed to by the emerging monopoly on advanced information technologies, which, most probably, will preserve the social and political status quo of the modern world.

The impact of the revolution of information on the sphere of international relations has acquired a global character and is breaking stereotypes on the correlation of forces and the character of their antagonism both at the international arena and within the national societies.

However, the main contradiction of the modern world that is emerging under the influence of new scientific and technological revolution is the contradiction between the unity of human environment and the increasingly integrated and interrelated technological sphere of mankind and the alienation of the world and the medieval political mechanism of combining the political wills of nation-states and classes of society.

As the technological sphere becomes more complex with growing interdependence and integration of the world, this contradiction will be more acute, while the attempts to resolve the problems of interethnic and social relations by old political means will entail a much greater risk of global technological catastrophe.

With the continuation of the present sustainable trend towards the developed political superstructure of the modern world that would lag behind the galloping technological sphere such a catastrophe seems unavoidable. Therefore, given such a view of historical process, the establishment of an efficient and universal mechanism of world community management seems to be an essential condition of human survival rather than just a possible word development option.

If, during many centuries, foreign policy was only a continuation of domestic policy and

the international situation was the result of confrontation or interaction of efforts of nation-states, such a cause-and-effect relationship between the national and international aspects has changed its polarity as a result of the revolution of information. Mutual dependence of international political processes based on global flows of information, that exclude national fragmentation, is based on the assumption that the center of decision-making is shifting from the sphere of national policies to the area of international relations. Naturally, the speed of transformation into a subject of policies will not be equal among different states, because the most powerful nations will preserve for quite a long time the tendency towards preserving their sovereignty in the view of the scope of their information potential which, ironically, by its development and its contribution to the integration of the world information makes their independence or isolation impossible.

However, this is not what matters most. The increasing probability of crises associated objectively or subjectively with conflicting interests of the international community and the use of modern and future information and scientific and technological capabilities shows that most likely the main hardships await mankind not within the framework of international confrontations. Precisely, the havens of the nation-state can turn into an abyss of technological catastrophe where the entire mankind may disappear. That is to say, there is a risk that national sovereignty could be identified with the maximum danger. Therefore, the containing factor of pure reason of international relations is the only counter-weight to diverse forms of extremism under the flag of national sovereignty. Thus, the international policy breaks the umbilical cord that binds it to national views and interests and reflects as a mirror the general objectively ready requirements for the survival of mankind and its aspiration to the stars. The area of international relations becomes precisely a theater of mankind where the most dangerous yearnings of its pre-information national conscience should be neutralized and reliable guarantees of its non-violent development should be established.

## Analysis

# RUSSIA'S NUCLEAR DETERRENCE: A LOOK INTO THE NEXT DECADE

**by Vladimir Medvedev, Lieutenant-General (retired)**

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With the end of the Cold War, Russian military and foreign policy tended to be less motivated by the nuclear factor. Obviously, this was connected to Russia's course toward integration in the world system, in which the issue of top priority was economic, social and political modernization of the country. It was also due to some problems facing the military nuclear complex: its sudden division into four parts and the necessity to overcome structural difficulties in the process of eliminating the nuclear arsenals of Ukraine, Kazakhstan, and Belarus.

However, by the end of 1993, this line of thinking was reviewed. The officially proclaimed military doctrine of the Russian Federation included among its guidelines the principle of nuclear deterrence and withdrawal from the previously adopted concept of non-use of nuclear weapons first. In his *Address on National Security to the Federal Assembly of the Russian Federation* of June 13, 1996, President Yeltsin stated, 'The Russian Federation is consistent in pursuing the policy of nuclear deterrence. The key factor contributing to its implementation is maintaining a sufficient level of nuclear potential both on the global scale (strategic nuclear forces) and on the regional and local scales (substrategic and tactical nuclear forces), as well as the deterrence capabilities of non-nuclear forces.'[1].

**Does Russia need nuclear forces?**
Many military experts, statesmen and public figures, regardless of their political

affiliation, argue that Russia should preserve nuclear forces at present and in the future[2]. The reasons for such unanimity seem to be the following.

First of all, Russia's former Cold War adversaries (the United States, Great Britain and France) and China maintain considerable nuclear arsenals. The US strategic nuclear forces, reduced under START I, will be able to carry about 6,000 nuclear warheads. By the end of this decade, US tactical nuclear weapons will amount to 480 nuclear air bombs on 13 air bases in Europe (in Germany, the UK, Turkey, Italy, Greece, Netherlands, and Belgium). Moreover, the number of other nuclear munitions at nearly 20 storage units on US territory is unknown because of recent reductions but ranges from 1,150 to 7,000[3]. Great Britain has approximately 200 sea-based and 100 airborne strategic warheads at its disposal. France possesses about 500 strategic nuclear warheads, attributed mainly to sea-based launchers, and 100 tactical nuclear warheads. China has about 270 strategic warheads (on chiefly intermediate-range missiles and airborne launchers) and up to 150 tactical nuclear warheads[4]. There is no doubt that the nuclear forces of the above-mentioned countries will exist in the 21st century.

Secondly, Russia's ability to maintain its national security with conventional means has sharply shrunk. After the collapse of the Soviet Union, the combat readiness of the conventional forces of the Russian Federation has diminished. The previous defense structure has lost 6 major military districts (Belorussky, Kievsky, Prikarpatsky, Odessky, Pribaltiisky, Zakavkazsky), which previously deployed the most battle-ready and efficient units, modern materials and military equipment, large arsenals, airdromes, command and control points, and other important facilities. The Russian Navy also finds itself in a very difficult situation: It has lost most of its shipbuilding and ship-repair facilities, as well as sea bases in general. The same thing is happening to the Russian Air Force. The anti-aircraft defense (AAD) system is no longer a single whole. In many places Russia has no protected or officially delimitated frontiers. In many border regions there are continuous tensions. The military industrial complex is in deep crisis, which impedes the development of new perspective means of combat, high-precision weapon systems in particular[5]. We must add to that such factors as the loss of allies in Central and Eastern Europe, the NATO enlargement eastwards and the approaching of the border of potential East-West military confrontation to Russian boundaries.

The third factor is the necessity to preserve Russia's Great Power status. Now that the Russian economy is extremely weak, it's impossible to accomplish this task without preserving its nuclear status. Russia cannot back its Great Power ambitions with a mighty economy the way nuclear-free Japan and Germany can. Russia needs this status to influence global developments in the interests of maintaining the comprehensive balance of power and ensuring strategic stability in the world.

The fourth factor is the increase in the number of states possessing weapons of mass destruction and missile technologies. Despite the NPT provisions and all the measures taken by the international community (including the Russian Federation) to strengthen the NPT regime, there is a constant threat of new nuclear weapon states that may emerge in the future. Two countries (India and Pakistan) have already tried to legalize their nuclear arsenals and obtain *de jure* the benefits of nuclear weapon states. We can't rule out the possibility of an Israeli decision to follow the same course. According to SIPRI estimates, at present Israel has about 100 tactical nuclear munitions[6]. In certain situations, nuclear weapons may be developed by countries that have acceded to the treaty (so called *threshold states*). There is a potential menace that there will appear new countries capable of using chemical and biological weapons. At the same time, there is a danger of proliferation of WMD delivery means, in spite of the unceasing endeavors of the international community to restrain the MTCR.

Thus, the current political situation implies that Russia will have to preserve its nuclear weapons in the foreseeable future. In this connection, it would be reasonable to analyze the quantitative aspect of the problem and its

correlation to the negotiations on nuclear arms reduction.

**Providing for Strategic Deterrence**

Since the nuclear might of the United States and Russia tremendously exceeds that of other nuclear powers, strategic deterrence is traditionally referred to in terms of Russian-US relations. It is believed that any nuclear forces capable of containing the US or Russian nuclear potential would be sufficient to deter Great Britain, France or China.

During the last 50 years of nuclear weapons existence we witnessed the evolution of strategic rivalry between the United States and Russia (the USSR). In the 1950s, mutual deterrence was provided for with the threat of massive retaliation. The 1960s are characterized with the attempts to make nuclear weapons be a *subtle* tool to attain political goals. In the 1970s and 1980s - the period of active talks on strategic arms limitation - the priorities shifted from victorious nuclear warfare (the US doctrine) towards realization of political objectives by threatening to start a nuclear war. What is the current state of affairs then?

The existence of the US and Russian nuclear arsenals leads to the good old, although slightly transformed, concept of deterrence. However, on June 17, 1992 the US and Russian presidents signed the joint charter, stating that the Russian Federation and the United States of America would no longer regard each other as adversaries and would develop partnership and friendship[7]. Despite all further attempts to clarify, specify or transform this partnership, we have to admit that it will continue to be the core principle of coexistence for two powers in the next decade. This conclusion is drawn by many Russian political scientists, saying that the possibility of large-scale war (above all, nuclear war) between the United States and Russia is minimal in foreseeable future.[8].

This conclusion is unambiguously proven in the *Concept of National Security of the Russian Federation*, which was approved by Presidential Decree No. 1300 of December 17, 1997. 'There are prerequisites for demilitarization of international relations, for strengthening the role of international law in the settlement of disputable inter-state problems. The danger of direct aggression against the Russian Federation has decreased. […] Taking into account sweeping change in the relations between the Russian Federation and other leading powers, it is possible to conclude that there is practically no threat of large-scale aggression against Russia in the foreseeable future.'[9].

Therefore, at the present stage of US-Russian strategic relationship, when the prospects of unleashing nuclear war against Russia are distant, deterrence acquires a new qualitative aspect. It somehow moves on the background of Russian-US relations, while importance is attached to economic, cultural and other non-military factors. Now we may give a different look at nuclear arsenals, upon assessing the quantitative levels necessary for deterrence. At the same time, the general scheme of deterrence remains the same.

Classical models of the exchange of nuclear strikes comprise the bulk of technical parameters. They include the type of strike and the readiness of nuclear launchers, their reliability, the probability of penetrating enemy's defense system, the probability of explosion of nuclear charges upon reaching the target, the scale of destruction of enemy forces with the nuclear attack, etc. The determining factors are the type of strike, the strategic missile defense system availability and the scale of enemy's destruction that will satisfy the attacking side.

Even in the most severe periods of the Cold War strategic adversaries - the Soviet Union and the United States - preferred to speak mainly about retaliatory nuclear attacks, although various American nuclear doctrines envisaged a pre-emptive nuclear strike against the enemy. However, in November 1997, President Clinton issued an executive order declaring a new US nuclear concept, which was mostly devoted to a retaliatory strike[10]. The Russian strategic nuclear forces are also guided by the strategy of retaliatory strike. This is proven by longstanding activities on improving protection of silo launchers and promoting mobile ICBMs, thus, implying greater survivability of missile systems after the enemy's pre-

emptive nuclear strike and enhanced capabilities of response strike. As Russian strategic offensive forces are being reduced, the number of mobile systems in their structure increases. Therefore, their orientation on retaliatory nuclear strike will be even more evident.

As for strategic missile defense systems, neither party possesses them, carrying out its commitments under the ABM Treaty of 1972. For several years, the US Congress has been passing acts that do not exclude the development of a US strategic missile defense system. Nevertheless, the Russian-US summit in Helsinki (March 20-21, 1997) gave hope that there would be chosen another option - further US compliance with the ABM Treaty of 1972. These agreements were confirmed in documents signed in September 1997 in New York by Russian Foreign Minister Yevgeny Primakov and US Secretary of State Madeleine Albright. The parties recognized the fundamental significance of preserving the viability of the treaty with the aim of maintaining strategic stability and international security. They emphasized the importance of the treaty for further reductions in strategic offensive arms and committed to prevent the circumvention of the ABM Treaty and enhance its viability. For that purpose, the parties came to an agreement that modern and would-be TMD systems should not pose a realistic threat to strategic nuclear forces of another party, be tested to give such systems that capability or be deployed for use against each other[11]. In general, it may be regarded as a US pledge not to deploy its strategic missile defense system at least in the next decade. As for Russia, it has neither plans nor intentions to deploy that system in the nearest future.

The scale of destruction, or let's say the level of damage (so called unacceptable damage), and the number of nuclear warheads necessary to reach the enemy's territory and accomplish this task are the most arguable parameters of the above-mentioned models. It is known that former US Secretary of Defense Robert McNamara laid down his vision of the problem. To contain the enemy from aggression, you should threaten him with elimination of 60-70% of his economic-industrial potential and 25-30% of population. To fulfill this mission, the retaliatory strike should provide for the delivery of approximately 1,000 nuclear warheads of medium yield. Or according to another concept, the targets should be hit by 500 nuclear charges of megaton yield. These criteria were elaborated at the dawn of nuclear confrontation, at the peak of Cold War and were of *maximalistic* character. Generally speaking, it is impossible to clearly define the unacceptable damage since it requires the consideration of many qualitative parameters of the country's might. However, these parameters, as a rule, are difficult to calculate in formal mathematical way.

In practice, the damage, inflicted to an enemy in retaliatory strike, is assessed, taking into account real combat capabilities of the specific group of nuclear forces. In fact, the issue is confidential and is not open for discussion. Nevertheless, we can presume that the level of damage is determined by the intention to achieve a complete defeat of the enemy in the nuclear warfare, i.e., to deliver hundreds of nuclear warheads to the targets in retaliation.

Russian experts, analyzing the consequences of the START II implementation for Russia, argue that the Russian strategic nuclear forces even after reduction to the levels, provided for in the treaty, will be able to inflict unacceptable damage to a potential aggressor in the retaliatory strike. These assessments imply that the enemy doesn't have the strategic missile defense system[12]. At the same time, they say nothing about the scale of this damage. Therefore, it presumably will stick to the above-described pattern.

Meanwhile, it's not difficult to imagine - it hasn't been disproved yet - that several dozens of nuclear warheads delivered to their targets would be enough to ruin any modern civilization. This attack may also cause secondary environmental disasters if the warheads hit nuclear power stations, dams of hydroelectric power plants, large oil and chemical depots. This damage can be regarded as unacceptable if we speak about deterrence not between irreconcilable rivals fighting to the death, but between civilized

countries that are planning - at least in normal conditions and at least on the surface - to maintain a partnership.

This gives us reason to think that there is still room for further strategic offensive arms reduction, even if the United States and Russia sign START III. In this connection we may ask how far Russia should move in reciprocal reduction of strategic arms. It seems to us that the optimal level for the Russian Federation for the next decade would be that which provides for *natural diminution* of Russian weapons and feasible within the country's economic capabilities.

Taking into account limited financing, by 2010 the Russian SNF will have several hundreds of RS-12M Topol single-warhead stationary and mobile ICBMs, about 105 RS-18 ICBMs (converted to carry one warhead instead of six) and some SLBMs. Other weapons, if not eliminated under START II (first of all, MIRVed ICBMs), will be decommissioned, due to expired lifetime and inability to replace them, for Russia lacks industrial capacity and facilities to produce these weapons[13]. If we presume that SLBMs will be capable of carrying several hundreds of nuclear warheads, the overall amount of Russian nuclear charges attributed to ICBMs and SLBMs will not exceed 1,500 by the second half of the next decade. The exact number is arguable but the approximation (referred to in the articles of Russian experts[14]) can be accepted for our further discourse. We could also mention additional number of air-launched nuclear missiles in the Russian SNF. However, we should take into consideration the difficulties, confronting aviation in Russia: the out-of-date types of strategic bombers, the lack of programs on construction of new heavy bombers, the drastic decrease in the number of training flights, etc. Hence, we have to admit that the prospects of preserving heavy bombers in the SNF are becoming more and more gloomy, if not completely unrealistic[15].

Thus, there is an objective necessity to cut down nuclear arsenals of both Russia and the United States by the end of the next decade. Russia will *naturally* reach this level of strategic offensive arms. Mutual reduction of the nuclear weapons would ensure the balance of power and hence, effective mutual deterrence[16]. That is the reason for the Russia's interest not only in the START II ratification, but in concluding a new START III and in further negotiations on strategic offensive arms reduction.

The above-produced proofs are true in the case of both parties' commitment to the ABM Treaty of 1972. However, if the United States makes another attempt to revise it, that should not be the cause for Russian refusal to cut down its SNF as it is called for by some Russian political experts. In its movement towards reduced mutual levels of nuclear forces Russian will have less to sacrifice than the United States. The initial level of strategic arms for reciprocal measures on increasing Russian nuclear might (if we have to respond to the deployment of the strategic missile defense system) would be the same, regardless of any obligations or their absence. Moreover, the Russian withdrawal from the *START* treaties in these conditions [deployment of MDS and reciprocal increase of nuclear might - **Ed.**] will be legally justified, unlike the current situation.

**Conclusion**

Thus, in the foreseeable future, nuclear weapons will continue to be Russia's means of deterrence from large-scale aggression of any kind and from any direction, either with the use of WMD or conventional armed forces. The basis of Russia's nuclear potential will continue to be strategic nuclear weapons as it has always been before.

The provision of deterrence should follow the existing and would-be Russian-American treaties on the strategic arms reduction (START I, START II, START III) and mutual measures to cut down tactical nuclear weapons. The reduction of the US nuclear potential to a level economically justifiable for Russia will enable it to maintain strategic equilibrium in relations with the United States.

At the same time, it is necessary to strive for US compliance with the ABM Treaty through further agreements on separating strategic and tactical missile defense systems, defining conditions and limitations for the deployment of tactical missile defense systems, preventing their use as strategic.

Further Russian steps on strategic nuclear forces' reduction in the framework of START II and START III could be always linked to the ABM treaty. This may happen either through preliminary refusal to carry out the

reductions (in the case of unclear US attitude towards the ABM treaty) or in the process of implementation of the concluded agreements. In any case, the initial level of strategic arms for reciprocal measures on increasing Russian nuclear might would be the same. However, the second option means that mutual reductions (taken before Russia's decision to start reciprocal measures) will lead to the considerable decrease in American nuclear arsenal. That will enable the Russian Federation to take less costly countermeasures.

Russia's decision to rest on nuclear deterrence to provide for national security and defense is transitory in the long-term perspective, although it is tremendously important for present Russian defense system. This conclusion can be drawn, taking into consideration not only the future of the Russian-American strategic arms reduction process, which seems to be irreversible, but the increasing pressure on nuclear weapon states on the part of non-nuclear weapon states, participating in the NPT.

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[1] *Presidential Address on National Security to the Federal Assembly of the Russian Federation*, Moscow, 1996, p. 24.
[2] See: The Concept of National Security of the Russian Federation. *Yadernoye Rasprostranenie*, No. 21, December 1997, pp. 88-105; *Military Reform: Armed Forces of the Russian Federation*, Moscow, 1998, pp. 12-14; I. Safranchuk, Nuclear Weapons in Post Cold-War Era: Are They Still Needed for the World and Russia? *Yaderny Kontrol*, No. 34-35, October-November 1997, pp. 23-26.
[3] *SIPRI Yearbook*, SIPRI, 1996, p. 612; V. Belous, Tactical Nuclear Weapons in New Geopolitical Situation. *Yaderny Kontrol*, No. 14, February 1996, pp. 2-7.
[4] *SIPRI Yearbook*, SIPRI, 1996, p. 612.
[5] S. Rogov, Armed Forces of Russia after Presidential Elections. *Nezavisimoye Voennoye Obozrenie*, June 27, 1996, p. 4.
[6] *SIPRI Yearbook*, p. 612.
[7] *State Visit of President of the Russian Federation B.N. Eltsin to the USA*, Moscow, 1992, p. 64.
[8] P. Romashkin, On the Problem of Choosing Criteria for the Unacceptability of Nuclear Use, Providing for Nuclear Deterrence. *Yadernoye Rasprostranenie*, No. 21, December 1997, pp. 47-53.
[9] The Concept of National Security of the Russian Federation, pp. 88, 94.
[10] *Segodnya*, December 9, 1997.
[11] *Documents of the Russian-American Summit in Helsinki (March 20-21, 1997)*, Moscow, 1997, 24 pp.
[12] See: *START II. Facts and Arguments (White Book)*, Moscow, 1993, p. 157.
[13] Ibid., pp. 116-118.
[14] *Nezavisimaya Gazeta*, September 18, 1997.
[15] *START II. Facts and Arguments (White Book)*, pp. 89, 100.
[16] *Segodnya*, October 27, 1998.

## Information

### GOSATOMNADZOR REPORTS: 142 GRAMS OF UNACCOUNTED HIGHLY ENRICHED URANIUM FOUND AT *MAYAK*

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*Translation into English. Abridged version*

While generally the safety of the nuclear power plants (NPP), research reactors and fuel cycle facilities in Russia is at such a level that allows avoiding severe accidents, the wear of many facilities combined with decline of skills and large-scale withdrawal of personnel create potential serious problems.

This conclusion can be drawn from the data supplied to the President's Office from the Federal Authority for Nuclear and Radiation Safety of Russia (Gosatomnadzor). The report summarizes the data of 1997, with the information concerning the condition of the enterprises and facilities of the Ministry of Defense being omitted.

The report clearly shows that though the incidents with nuclear materials have occurred less frequently than in 1993-95, they still do occur.

For instance, on January 13, 1997, during the procedure of technical acceptance of 20-ft sea containers with natural uranium concentrate arrived to the railway station Kapitolovo from Tajikistan it was found that one container had a 2 x 20 cm breach in the side wall, and a 3 x 30 cm breach was found in another container. The seals were found intact. The commission of the enterprise *Izotop* opened and examined the TUK-44/1 shipment casks. No damage or loss of tightness was found. The broken holes were tightly welded-up, and the casks were closed with all locks, and sealed.

On March 24, 1997, information was supplied about the detaining of a criminal group at an

attempt to sell 5.2 kg of uranium at the town of Berdsk.

On April 7, 1997, during the examination of the empty TUK-30 shipment casks at PO *Mayak* (Ural Area Administration) which arrived from the Novosobirsk chemical concentrate plant, two pieces of highly enriched uranium (HEU) were found in TUK cask No. 20, their total weight 142 g.

In 1997, two failures occurred at the nuclear fuel cycle facilities, resulting in deviation from normal operation or deviation from operational limits and conditions. No personnel were overexposed.

The first of these failures, qualified as abnormality, took place on January 18, 1997, at the Siberian chemical combine*:* an unscheduled shutdown of ADE-5 production reactor at the Reactor Plant of the Siberian chemical combine due to decline of thermal parameters of a peripheral channels caused by low coolant flow rate and sticking fuel slug in the fuel channel. Investigation showed that the reason of the failure was fuel slug *swelling.*

The second failure, categorized as an incident, took place on May 15, 1997, at AO Novosobirsk chemical concentrate plant: a self-sustaining chain reaction began in two communicating vessels for collection of etching solutions located in an unmanned room of department # 1 of the main production facility of the plant. On the subsequent two days five outbursts of chain reaction were recorded, which was indicative of near-criticality of the facility. The dose rate directly near the vessel was 10 rem/hr.

The beginning of the self-sustaining chain reaction immediately triggered the emergency alarm system, and the personnel of the department were evacuated. The radiation monitoring system showed no release of radionuclides to the production premises or environment. Steps were taken to bring down the radioactivity of the vessels. The examination of the vessels revealed no failure or deformation, which may have resulted from the self-sustaining chain reaction.

According to the conclusion of the commission set up to investigate the incident, the cause of the self-sustaining chain fission reaction was HEU accumulation in the vessels of nuclear-hazardous geometry. The vessels were incorrectly categorized as safe equipment, which resulted in the non-establishing and non-monitoring of the process parameter limits important for nuclear safety. The incident also revealed faults in the nuclear material accounting and control system.

The investigation of the incident causes and subsequences revealed serious faults in the organization of supervision of the observance of safety rules and codes in operation of equipment at nuclear-hazardous areas. Gosatomnadzor of Russia conducted inspections of the Minatom facilities to see if the respective services observe the requirements of the regulatory documents pertaining to the organization and execution of supervision of nuclear safety parameters; the efficiency of the nuclear material operational accounting system was also checked. These inspections revealed a range of noncompliance with the requirements of the appropriate regulatory documents, which is indicative of inadequate supervision by Minatom of observation of the nuclear safety requirements. The most characteristic faults in the organization of supervision are as follows: absence of systematic control of nuclear safety parameters of the equipment used in the nuclear-hazardous areas; awkwardness and inefficiency of the operational nuclear material accounting system, which is often based on the principles of nuclear material book-keeping and secrecy, but not on the principle of potential hazard of nuclear materials recommended by the IAEA.

At PO *Mayak*:

1) On March 5, 1997, in contravention of the provisional permit of Gosatomnadzor of Russia, under which uranium transfers were allowed only within the territory of PO *Mayak*, the HEU removed from nuclear weapons was shipped to the Ural electrochemical combine in the form of oxides and to the AO *Novosibirsk Chemical Concentrate Plant* in the form of bulk metal.

2) On April 7, 1997, 142 g of unaccounted HEU delivered from AO *Novosibirsk Chemical Concentrate Plant* was found in an empty container; the results of the inspection demonstrated that the plant employees failed to comply with the requirements of nuclear material control and accounting.
3) On August 27, 1997, contaminated floor area of 1 to 2 $m^2$, gamma-radiation level 40 to 200 μrem/s, was found in the building of department No. 4 of the *RT-1* Plant. The contamination occurred due to the walking conveyer sump overflow at furnace EP-500/2 caused by valve leakage during the header cleaning with desorption solution. The contamination was eliminated.
4) On October 6, 1997, increased radiation background was detected in assembly building No. 954 of the *RT-1* Plant. The measured exposure dose rate was 300 μrem/s, and at some spots it was as high as 1000 μrem/s. The source of radiation background was the industrial water header drained in preparation for repair operation. Due to water draining, vacuum was created in the empty part of header; as a result, when water, by mistake, was pumped into the pipeline connected to the storage tank, some contaminated air and a negligible amount of contaminated water found their way into the header.
5) False scram system occurred at the LF-2 reactor due to a technical failure of the control and scram system. The control and scram system elements were checked during scheduled preventive maintenance. Design work is under way to switch the control and scram system to more reliable uninterrupted power sources.
6) Cracks were detected in the support rings of the railway cars carrying shipment casks with spent fuel. The Ural Area Administration banned the use of those rings and proposed to design more reliable supports. Design work is under way to change the pattern of load distribution of the supports and reduce stress on the structural elements. The work is being supervised by the Oziorsk Inspection.

Safety condition of the research reactors poses a serious problem.

For instance, on July 25, 1997, a failure of a research reactor occurred at MIR.M1 facility at the RF State Research Center RIAR, causing radiation consequences. The reactor facility was shut down because of considerable increase in the readings of special monitoring instruments and sensors of the cladding integrity monitoring system, caused by loss of tightness of an operation fuel assembly. During reactor refueling operation considerable radiation release occurred through the Institute ventilation stack. The Dimitrovgrad Inspection prohibited the reactor refueling program and bringing it on load until the causes of increased emissions have been eliminated.

**Operational failures of nuclear research reactors in 1996-97**

| Causes of operational failures of nuclear research reactors | 1996 | | 1997 | |
|---|---|---|---|---|
| | Reactor scram | Reactor emergency shutdown | Reactor scram | Reactor emergency shutdown |
| Errors of nuclear research reactor personnel | 13 | - | 8 | - |
| Malfunction of I&C system and/or control and scram system | 21 | 5 | 25 | - |
| Malfunction of electrical equipment | 6 | - | 8 | 1 |
| Malfunction of thermo-mechanical equipment | - | 2 | 2 | 6 |
| Malfunction of experimental facilities | 2 | - | - | - |
| External voltage oscillation | 24 | 1 | 16 | - |
| Other | 1 | 1 | - | 1 |
| Total | 67 | 9 | 59 | 8 |

Gosatomnadzor of Russia carried out an additional investigation of the circumstances of the failure and issued recommendations on the measures to eliminate the causes of the malfunctions. The incident did not result in the radiation exposure of the personnel, population, or environment.

The verification of the procedures of investigation of and accounting for the reactor operational failures at the enterprises-owners of nuclear research facilities, conducted by the area and territory inspections, showed that the procedure of investigation of the failure circumstances complied with the RD-04-10-94 requirements. The results of the analysis of the operational failures at the nuclear research facilities are used to plan inspections and are taken into account in conducting expert review of the materials supplied by enterprises-owners of nuclear research facilities with the applications to Gosatomnadzor for operation license.

It was noted that most facilities have worn and obsolescent instruments and equipment, which had not been replaced for a few years due to lack of finance, and this is one of the principal reasons of equipment and instrument malfunctions.

The report notes, 'Assessment of human factor for operational safety of nuclear research facilities is of material importance. Change of the personnel generations is under way at the nuclear research facilities. The situation is characterized by drop on respect for the profession, lack of influx of young specialists, personnel aging, and reduction of the number of personnel of the nuclear research facilities.'

*Classification of incidents at Russia's NPPs in 1997*

| NPP name | **Incident category** | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P10 | |
| *Balakovskaya* NPP | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 5 |
| *Beloyarskaya* NPP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Bilibinskaya* NPP | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 7 | 8 |
| *Kalininskaya* NPP | 0 | 1 | 0 | 0 | 3 | 0 | 1 | 3 | 1 | 1 | 10 |
| *Kolskaya* NPP | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 1 | 7 |
| *Kurskaya* NPP | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 5 | 3 | 14 |
| *Leningradskaya* NPP | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 4 |
| *Novovoronezhskaya* NPP | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 9 | 2 | 6 | 21 |
| *Smolenskaya* NPP | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 1 | 1 | 1 | 10 |
| Total: in 1997 | 0 | 2 | 0 | 0 | 19 | 0 | 10 | 16 | 12 | 20 | 79 |
| in 1996 | 0 | 0 | 1 | 0 | 31 | 0 | 9 | 21 | 5 | 21 | 88 |

*Level 1 events according to the International scale INES, occurred in 1997*

| | **Date and place of event** | | |
|---|---|---|---|
| | 19.03.97, *Balakovskaya* NPP, Unit 1 | 15.02.97, *Kalininskaya* NPP, Unit 2 | 03.09.97, *Kurskaya* NPP, Unit 2 |
| Description of event | Scheduled testing showed that drop time of three control rods of the control and scram system exceeds 4 sec. | Scheduled testing showed that drop time of three control rods of the control and scram system exceeds 4 sec. | Emergency shutdown of the Unit by AZ-5 scam because of tripping of two turbogenerators, caused by personnel errors, smoke at turbogenerator TG-3 |

| | | | |
|---|---|---|---|
| Cause of event | Additional friction between control rod tube and fuel assembly guidetubes | Additional friction between control rod tube and fuel assembly guidetubes | Non-authorized work of personnel measuring discharger insulation of the operating transformer of own needs |
| Falling outside safety limits and/or conditions of safe operation | No/Yes | No/Yes | No/No |
| Assessment in terms of safety | Potentially important for safety | Potentially important for safety | Untimely elimination of smoke at the own needs transformer could have caused fire and severe consequences |
| Nature of failure | Failure or significant malfunction of reactivity control | Failure or significant malfunction of reactivity control | Loss of internal power supply |

The report stresses that *'most Russia's research reactors are obsolescent and worn'*.

As for the NPP safety, the situation here if relatively satisfactory.

Therefore, the greatest concern is not the NPPs but the nuclear fuel cycle facilities, primarily those of Minatom.

For all that, the report contains the following conclusion: 'In the conditions of the existence of two governmental nuclear and radiation safety authorities, Gosatomnadzor of Russia and Ministry of Defense of Russia, the individual organizations try to evade any governmental supervision in management of nuclear materials, including HEU (90% enrichment and more). An example is the illegal dispatch of highly-enriched uranium from PO *Mayak* to the Novosibirsk chemical concentrate plant.'

**Newsboard**

## Spring 1999

## VALYNKIN THANKS NUNN-LUGAR FOR RUSSIAN NUCLEAR SAFETY

**1999, February 4.** Colonel-General Igor Valynkin, head of the 12th GUMO (Main Directorate of the Russian Ministry of Defense), held a press conference in the MOD building in Moscow. The meeting with the press concerned the problems of implementation of the agreements between the Russian MOD and the US Department of Defense on providing for the safety of handling and transportation of nuclear weapons due for disposal under the *Nunn-Lugar Program*.

Gen. Valynkin started his speech with expressing gratitude to the US Government and to Senators Nunn and Lugar in person. He emphasized that the Russian-American CTR agreement of 1992 encouraged a real breakthrough in the relationship, concerning such sensitive matter as safe storage, use, transportation and disposal of nuclear weapons.

Gen. Valynkin pointed out that the Russian MOD was interested in further development of such cooperation and was eager to make every effort for successful implementation of cooperation programs between the Armed Forces of two states for American assistance related to the most painful aspects of the 12th GUMO activities.

The aid rendered to Russia in the framework of the *Nunn-Lugar Program* is not limited to granting sophisticated electronic equipment and allocating financial means for the modernization or reconstruction of nuclear weapons storage facilities. Several programs on providing training and performing tests of modern means of physical protection of storage facilities are also under way and are at different stages of implementation. The USA supplies Russia with equipment, necessary for mounting external security systems for the storage facilities, i.e. Americans supply Russia even with barbed wire for fencing the territory of nuclear facilities of the 12th GUMO.

Moreover, according to Igor Valynkin, in Sergiev Posad Americans help to train Russian personnel to operate the shipped materiel and checkout equipment. On the basis of the MOD Scientific Research Center of Armored Forces (St. Petersburg) there were set up the training facility for Russian specialists and information-analytical center for elaborating the guidelines of decision-making in eliminating the consequences of incidents with nuclear weapons.

Colonel-General Valynkin maintained that under the current agreements the USA had the right to conduct spot checks and inspections of Russian facilities to verify appropriate use of technical equipment and spending of allocated financial means. Recently, the on-site inspection monitored the shipment casks, railway cars, protective covers, emergency equipment, and various computer and security appliances. The United States supervises the construction of training facility for testing physical protection systems.

All supplied materiel has been thoroughly checked by the US verification commissions, which have audited all registration and accounting documents and recorded the state of equipment. According to Gen. Valynkin, such strict and persistent control suits both parties since, thanks to those concerted efforts of Russian and American specialists, there have been no cases of inappropriate use of shipped equipment or allocated financial means. It means that there will be stable situation at nuclear weapons storage facilities, ensuring the safety of Russian citizens.

In recent years the 12th GUMO has received about $80 million in the framework of the *Nunn-Lugar Program*. The money was spent on solving the urgent problems of the Directorate that would have been unable to solve them on its own due to scarce budgetary resources. Nowadays the amount of American aid is twice as big as the budgetary financing of the 12th GUMO.

It's important that the USA doesn't insist on on-site inspections of the secret nuclear weapons storage facilities. The only exception was made for Commander-in-Chief of the US Strategic Command General Habiger with a condition that his Russian counterpart would see American bases. Should this status quo, respect for the dignity of the former superpower and its national interests (including some nuclear secrets) be preserved the USA can be sure that the Russian MOD will continue to back the CTR.

## MINATOM REVIEWS 1998, MAKING PLANS FOR 1999

**1999, February 9.** The Ministry of Atomic Energy held a sitting of the Ministerial Board, which studied the proposals of departments and joint stock companies, pertaining to the Minatom structure, reviewed the results of activities in 1998, and defined major tasks and trends of development for 1999.

In his opening address Minister of Atomic Energy Yevgeny Adamov stated that the primary area of activity for the industry continued to be the development of safe and cost-effective nuclear energy as well as maintenance of sufficient nuclear potential through improving organizational and technological structure of the nuclear military complex. Yevgeny Adamov also mentioned some other priorities, like working out and serial manufacture of science-intensive and competitive production for national economy, and preservation and increase of scientific, technical, productive capabilities of the industry as well as its skilled personnel.

The Ministry was able to provide for smooth operation of nuclear fuel cycle enterprises, organized constant production and shipment of nuclear fuel to all Russian nuclear power stations. There was finished the first stage of reconstruction of zirconium production facilities at the OAO *ChMZ* with the annual output exceeding 2,000 tons of metal bars. There was also constructed the storage facility for fissile materials and carried out four regular trips of the special train in order to transport the spent fuel from nuclear powered submarines of the North and Pacific Fleets.

The export of low-enriched uranium, converted from highly-enriched uranium, increased in 1998. The amount of processed HEU reached 30 tons a year, which reflected the active development of this sector.

The Minister marked the steady work of industrial facilities and nuclear energy sector of the ministry in 1998. The gross production output increased to 101.5%, compared to the respective figure in 1997: 102.3% in the civilian production and 81.3% in the defense sector. The amount of defense contracts decreased by 20% in 1998.

In 1998, due to permanent arrears in payment, the energy output of all Russian nuclear power stations (including *Leningradskaya* nuclear power station) decreased from 108.3 kW/h to 103.4 kW/h (or 95.6% of the 1997 figure). In 1999 the Ministry of Atomic Energy is planning to complete the construction of three more nuclear power stations in Rostovskaya, Kalininskaya and Kurskaya oblast, which are 80% ready. *Rostovskaya* nuclear power station requires additional examination to assess its impact on environment (at the urgent request of the local administration) but this examination is likely to be finished in near future.

Scientific and research institutions also contributed to safety and reliability of nuclear power stations by completing the development of nuclear power technologies (WWER-640 and WWER-1000) of enhanced safety, which are more cost-effective and environmentally-friendly. These technologies are to be introduced at *Sosnovoborskaya* and *Novovoronezhskaya-2* nuclear power stations.

In 1998 some special federal programs were implemented with the help of foreign investors: $17.3 million were invested in construction of the fissile materials storage facility at PO *Mayak* and $48.25 million were allocated for disposal of nuclear powered submarines and radioactive wastes.

According to Yevgeny Adamov, the principal area of activity in 1999-2000 will be conversion of Minatom enterprises. In this connection First Deputy Minister of Atomic Energy Lev Ryabev maintained that 2003

would leave only two out of four enterprises, directly engaged in assembling and dismantling of nuclear device. All plants will stop assembling of new nuclear munitions by 2000 while dismantlement of the latter will terminate by 2003. On the top of the list for conversion are *Avangard* plant in Sarov and arms producers in Penza-19.

The Ministry of Atomic Energy laid down plans for conversion of its military plants. They will serve the needs of nuclear energy sector, machine building, medicine, electronics and communications, etc. The attention will be focused on increasing export potential of converted enterprises.

Restructuring of the industry in 1999-2000 will result in layoffs of more than 15,000 people. Nowadays Minatom with its joint stock companies has about 556 thousand employees. That's why it has launched the special federal program "*Nuclear Cities*" for 1998-2000, which is aimed at providing employment for the population of closed administrative territorial units (CATU). The program includes a set of measures to create 23.7 thousand new jobs and to preserve 16.6 thousand of already existing jobs. The money for program fulfillment will be earned from extra-budgetary sources. The USA and Russia have already signed an agreement, providing for American assistance in job creation in CATU and for more than $30 million of investments for that purpose.

Yevgeny Adamov stressed that the existing tensions in CATU could be accounted for arrears in wages. As of January 1, 1999 the Government owed money for 2.1 month in the industrial sector and for 1.3 month in scientific sector with the average salary being mere 1,800 rubles in the industry, 2,800 rubles for the nuclear power stations personnel, and 1,400 rubles for the scientists. Minatom plans to neutralize this disproportion by increasing export potential of the industry. In 1998 the amount of export of goods and services was more than $1.88 billion. The Ministry of Atomic Energy holds its leading share of the world HEU market. Export of highly-enriched uranium accounted for 75% of total export.

According to First Deputy Minister Lev Ryabev, at *Mayak* chemical combine there will be set up an underground laboratory for developing the technology of dumping vitrified wastes in specially equipped sub-terrain storage facilities. In his opinion, Russia has a full right to use peaceful nuclear explosion for that purpose. However, he said, we understand that our actions may be misinterpreted by members of the *nuclear club*, that's why we are working out so expensive but more radiation-proof technology.

The Ministry is planning to build new enterprises in the Northern and Pacific regions since now it is in charge of coastal infrastructure of the bases for storage and unloading of radioactive fuel from nuclear powered submarines. New structures will include four coastal technical bases of the Navy, there will be repaired two floating technical bases for recharging nuclear fuel and be built inshore complexes for unloading and reprocessing of liquid radioactive wastes at *Zvezda* plant in Bolshoi Kamen and *Zvezdochka* in Severodvinsk. Ten trainloads of spent nuclear fuel will be sent for reprocessing and Minatom will initiate the disposal of nine multipurpose and broken submarines.

## IRAN: US-RUSSIAN RIVALRY OR DEAL?

**1999, February 24.** The US Department of Trade published the list of ten Russian companies, falling under the US sanctions. They are the Moscow Aviation Institute (MAI), the Mendeleyev University of Chemical Technology (RkhTU), the Scientific Research and Design Institute of Power Technology (NIKIET), the Baltic State Technical University (*Voenmekh*), *Europalace-2000*, *Grafit* Science Research Institute, NPC *INOR*, *Moso* company, NPA *Polus*, *Glavkosmos*. All of them are accused of assisting Iran in its program of WMD and missile delivery means development. American companies are not allowed to deal with Russian *black sheep* under the threat of fines or trade boycott. In accordance with our sources of information January claims to NIKIET are not new: the Russian part was familiar with them last year and agreed with them on the whole. However, it asked the United States to postpone the imposing of sanctions and Americans complied with the request.

There is a sort of tradition in intensifying criticism of Russian-Iranian cooperation. It has always happened on the eve of Russian-American high-level talks, on the eve of Gore-Chernomyrdin summits precisely. During Gore-Kiriyenko negotiations the issue of Russian-Iranian cooperation was left practically untouched since informal talks on the matter had already been finished by that time (the negotiations were followed by imposing of sanctions in response to Iranian tests of Shahab-3 missile). This year on the next day after the declaration of sanctions First Deputy Prime Minister Yury Maslyukov arrived in the United States. Thus, the tradition of information pressure at preparatory stage of talks continued.

However, according to PIR Center estimates, the main reason for that is the US-Russian wrangling about the core issues of Russian export control and export policy. The USA can't put up with the construction of nuclear power station in Bushehr for it affects their interests in the Middle East and in the Caspian region. The United States are seeking political and military domination over these areas and, hence, they don't need strong and developed Iran. Russian-Iranian cooperation won't help the latter to create its own nuclear weapons for the nuclear technology of the station in Bushehr can't be used to produce nuclear materials for military purposes, although not all American experts would agree with that. At the same time access to peaceful nuclear energy will enable Iran to succeed in carrying out its economic development programs and will strengthen its positions in the region counter to the US interests. What's more, American experts insist on Iranian desire to create its own nuclear weapons - another *eyesore* for the United States. Some experts add to this the US striving for domination over the peaceful nuclear energy market and try to oust the business rivals with political means.

The substance of this bargaining is clear: the USA offers to change the *Bushehr* contract for financial and technical assistance in creating effective system of export control. Both parties can benefit from this exchange. Russia will no longer be subjected to criticism, which undermines image of the country in the world public opinion. It is even more important for Russia in the situation of financial crisis and unsuccessful attempts to rehabilitate itself before the West on the whole and its financial institutions in particular. Moreover, Russia will be able to get the compensation, for instance in the form of US mediation in Russian dispute with the IMF.

The major problem for Russia is not the exchange itself but its conditions and amount of compensation for suspension of its cooperation with Iran. According to our sources of information, Minister of Atomic Energy Yevgeny Adamov emphasizes commercial benefits for Russia from its ties with Iran. This attitude leaves the chances for bargaining and determining the bids, i.e. conditions and form of *reimbursement*. Taking into account the position of Russian leadership, which considers the US claims to be merely a means of political pressure, the success of exchange seems even more evident.

## RUSSIAN GENERALS ARE OPTIMISTIC ABOUT Y2K SOLUTION

**1999, March 3.** The Russian MOD most competent experts in the Y2K problem held their press conference, concerning this international problem. Those, attended the conference, were Deputy Chief of the 8th Department of the General Staff Major-General Valery Khalansky and Chief of the 4th Central Scientific Research Institute of the Russian MOD Major-General Vladimir Dvorkin. Both of them were eager to explain to Russian and foreign journalists how actually things were going with Y2K in Russia.

The current controversy results from the MOD position declared half a year ago. Then the Ministry of Defense announced that to cure all Russian computers it needed only 1.5 million rubles and that the problem itself wasn't worth a hill of beans. However, the life showed that the situation was quite different.

Major-General Vladimir Dvorkin said that the Ministry had already defined the areas of increased attention, including the Russian nuclear missile forces and vital systems of command, control and support of the Russian Armed Forces. Some measures had already been taken and there were not found any fatal errors in functioning of the systems,

providing for safe storage of nuclear weapons. The same relates to their control systems.

The Soviet automated system of control over the Strategic Missile Forces was designed in the 60s in complete isolation from entire world. That's why it's a unique indigenous program that cannot be infected with computer viruses, broken by hackers (since it has close character of information exchange within the MOD environment) or suffer from transition to a new date. It can be accounted for the fact that designers deliberately didn't input any calendar dates in this computer system. Computers start and comfortably *exist* in their own operating system from the very beginning of executing command, i.e. they independently emulate their work in real-time mode.

On the other hand, according to Vladimir Dvorkin, the real headache for the Ministry is the Russian system of control over orbital military group as well the systems of early warning of missile attack and of outer space control. In this case if no measures are taken the Russian systems may get out of control or may no longer exist after 2000.

To prevent that, the MOD needs additional funding. Solution of the Y2K problem in Russia as a whole requires about 2-3 billion rubles from the federal budget to be allocated to various agencies and state-owned enterprises. The military ask for only 85 million rubles. Major-General Dvorkin pledged that this money would be enough to ensure the safe transition of the systems of strategic control over state security to a new millenium.

Meanwhile, Gen. Dvorkin informed the media of the experiments that had been carried out to check the systems and to locate those, needing replacement or up-grade of software and hardware. This task was accomplished by 30 working groups that monitored and verified characteristics and functioning of 134 MOD facilities. The latter included computer systems of the Russian SMF command posts and the Main Center for Control over Orbital Group. The experts found potentially unsafe computers at 74 objects and scheduled the plan of their replacement or up-grade. Anyway the MOD has already purchased 50 new computers for the Center for Control over Orbital Group in Krasnoznamensk.

The MOD is planning to do away with the Y2K bug no sooner than October 1999. By that time it will finish comprehensive testing of new software and will replace or repair some computers. However, all that will be possible only if the Government provides for steady financing of all MOD activities in this area.

Vladimir Dvorkin is optimistic about the prospects of struggle against the Y2K bug, although he doesn't rule out the possibility of errors in receiving the information on strategic missile launches. That's why the MOD assured the media that in case of glitches in certain systems the Ministry would do it best to localize them as soon as possible and to eliminate most dangerous consequences. Gen. Dvorkin welcomed the US proposal to hold a meeting in the US Space Command Headquarters even to exchange opinions on the course of work in this area and on the prospects of finding an adequate solution.

The aforesaid proposal was also backed by Senators Dodd and Bennet, chairmen of the Senate Committee on the Y2K problem, on March 1, 1999 when the CBS broadcast live their report, predicting real troubles with the way Russia was preparing to solve Y2K problem. Senators maintained that they drew this conclusion after reading a report of the commission members, who had visited Russia and had become familiar with the state of affairs in this area. According to Senators Dodd and Bennet, transition to a new millenium is a global disaster and there is only one way to overcome it. That is to keep in store some canned food and potable water for a couple of days until all computer errors are eliminated, trade starts to function normally, and there is no more Russian ICBMs falling down on the US territory… That's why Senators Dodd and Bennet welcomed the possibility of a meeting between the representatives of the USA, Russia, India and Pakistan in the US Space Command Headquarters in Colorado Springs. The meeting should take place several days before 2000 so that the aforesaid representatives may exchange information on unauthorized missile launches and glitches in the system of control over such accidents. Hopefully, Russian optimism combined with American pragmatic view will help to find the golden mean in solving the Y2K problem.

**Analysis**

## IRAN'S NUCLEAR AND MISSILE PROGRAMS AND RUSSIA'S SECURITY

**by Ivan Safranchuk,**
**PIR Center Research Fellow**

[**This article is based on PIR Study Papers No. 8. *Nuclear and Missile Programs of Iran and Russian Security Policy: Russian-Iranian Cooperation and Export Controls*. October 1998**].

*Translation into English. Abridged version*

**Iran's influence on Russia's security**
Iran is affecting Russia's security in several aspects. First, Iran is a potential source of external military threat. Second, Iran is willing to exert its political and geopolitical influence on the Trans-Caucasus states which affects negatively the policy of the Russian Federation aimed at maintaining its political and economic presence in that region. Third, Iran is traditionally viewed as material and ideological support basis for Islamic movements, while there are already separatist Islamic movements being active in Russia. Fourth, Iran can be considered as a competitor to Russia's position on the world oil and gas markets.

The above factors indicate that Iran may well be viewed as one of Russia's political and economic rivals. However, such competition cannot yet be assumed as the one having antagonistic instead of cooperative forms. Possibilities of cooperation with Iran both in the fields of geopolitics and economy are determined by the presence of other *players*, the level of antagonism with which exceeds the potential of Russian-Iranian antagonism.

The field of Iran's geopolitical maneuver is limited by the fact that the permanent condition of extending Iranian influence is the *imposition* of ideological model adopted in Iran. This model is unacceptable for the leaders of the former USSR Muslim republics and Russia. With a US and other western powers' influence being exerted on the region of Iran's potential geopolitical domination, the country is running the risk of being left with no political clientele, which is likely to turn into a real geopolitical and economic isolation.

This situation forces Iran to take an attitude which is close enough to Russia's – and irrespective of the will of the latter – for instance, concerning the Karabakh conflict, the problems of the Caspian sea, settlement in Afghanistan. Such situation gives Russia and Iran an opportunity of joint *play* which Russia has not practically used.

The prospects of joint *play* of Russia and Iran should be viewed as a variable factor. First, given the tendency of geopolitical reconciliation between Iran and the USA, the level of antagonism between those two countries may be significantly reduced while it is exactly this antagonism that is the basis for transformation of Russian-Iranian rivalry into cooperation. Second, the potential for transition of Russian-Iranian rivalry into antagonistic forms is a permanent factor, though not deterministic, irrespective of other factors.

In case of Iran one may have not worry that the Russian Federation will be used by that Islamic country as *a bargaining point* in a possible *trade-off* with the United States: even the softest methods of reconciliation between Iran and the USA are likely to lead to a significant curtailment of influence and self-dependency of the Islamic republic.

Nonetheless, Russia cannot view Iran as an ally and should consider the prospects of worsening relations with that country, including a military conflict. This means that Russia should develop cooperation with Iran within the scope, which rules out the emergence of Iran's ability to use military force against Russia. The Russian Federation is not interested in Iran acquiring arms of mass destruction and nuclear arms in particular, as well as means of their transportation with a range enabling to reach the territory of the Russian Federation. We agree with the opinion of the officer of the Federal Security Service Mikhail Kirillin quoted by the *Yaderny Kontrol Journal,* 'Russia

is significantly more than the USA interested in the fact that none of the countries adjacent to its southern borders must ever have a developed long-range missile potential.'[1].

**Iran's nuclear program**

Iran's nuclear program started in the mid-70s. The international community at that time was not worried by a possible military use of the atomic energy by the shah regime[2]. A wide program of constructing 23 nuclear reactors on the Iranian territory was adopted. $30 billion were planned to be used for peaceful atomic energy development[3].

Nuclear development programs were scrapped in 1979 after the Islamic revolution. All foreign and most Iranian specialists left the country; construction of several nuclear objects remained incomplete, including the nuclear power station in Bushehr. In the early 80s Iran began taking efforts in order to prevent the complete collapse of the atomic energy sector: a nuclear center at the Teheran University maintained its activity; in the late 80s Iran built a research center in Esfahan; development of uranic ore began in Yazd province.

Implementation of Iran's current program to develop nuclear energy sector is underway as part of a series of measures of economic development which seriously suffered during the 80s[4]. Economic development leads to more consumption of electricity. Since late 80s Iran has been actively working on developing electric energy facilities. The potential of hydroelectric power stations has been studied but eventually it became obvious that the country did not have enough water resources[5]. The preference was given to nuclear energy.

By the early 90s Iran was supporting and trying to develop nuclear energy sector. The experience in building the research center in Esfahan has showed that Iran needs foreign assistance in the nuclear energy. Such assistance should cover two major venues: deliveries of equipment and nuclear materials; technical assistance and support, rendering of specialists (lack of qualified personnel was one of Iran's most acute problems along with training of new specialists; that is why since the second half of the 80s the authorities started to invite those who left after the revolution back to the country)[6].

**Iran's nuclear program structure**

National programs in the sphere of nuclear energy are coordinated by the Organization of Atomic Energy of Iran (OAEI) established in 1974[7]. The financing of specific projects from the national budget is implemented through that organization. The OAEI is subordinated and reporting directly to president of Iran. The organization is interacting with the relevant ministries, agencies and departments.

There are some snatchy reports that the OAEI is not in full control over nuclear programs, and that part of such programs is implemented under the umbrella of the military[8], the Ministry of Defense and the Guards of Islamic Revolution Corps. These reports, however, are corroborated.

**Russian-Iranian cooperation in the nuclear area**

In the 90s Iran has been actively involved in attempts to engage in the cooperation in the nuclear area a number of countries such as Argentina, Brazil, Pakistan, China, India, Belgium, Germany, Spain, South Korea and Cuba.

The Soviet Union was able to enter the Iranian market only in the late 90s which could be explained by the Soviet attitude towards the Iran-Iraq war. In 1989 the long-term trade and cooperation program until 2000 was adopted: the accord was signed between the OAEI and the Soviet Ministry of Transport. Soviet specialists were brought in to Iran for estimating the methods to increase the electric energy production. Preparation of the contract to build a nuclear power station started around 1991.

The Iranian government wanted not only to complete the construction of the *Bushehr* nuclear power station but also to build two or three new stations. The Iranians were negotiating the completion of the construction in Bushehr with several European and South American companies.

They also proposed to Russia to build a new station in the north of the country, on the Caspian seashore near the town of Gorgan[9]. After the study of the territory Russian specialists did not find an appropriate site for the construction and proposed to build the station in the south of the country, near the Persian Gulf[10]. At about the same time the negotiations regarding the *Bushehr* station came to a gridlock, and Russia proposed to complete the construction there[11].

On August 17, 1992 the Soviet-Iranian agreement "*On the Peaceful Use of the Nuclear Energy*" was signed which was sharply criticized in the West[12]. In April 1993 the agreement was ratified by the Iranian side and came to effect[13]. The subject of the accord was estimated in various ways: some were saying there was going to be one nuclear power station[14], while the other were sure there will be two[15].

On January 8, 1995 two documents were signed in Teheran:

- The contract to complete the construction of the first block of the *Bushehr* station was signed by *Zarubezhatomenergostroi* (Agency for construction of nuclear facilities abroad) association and the OAEI;
- The protocol of negotiations between Russian Minister of Atomic Energy Prof. V.N. Mikhailov and Vice President of the Islamic Republic of Iran and President of the OAEI Dr. R. Amrollahi.

Provisions of the contract were agreed upon in late September 1994[16]. The fact that the period between the work on the draft contract and the actual signing of it was only three months indicates that by that time contradictions in the Russian government regarding the contract with Iran and the US reaction to it had been overcome. Probably, they had been overcome even earlier. According to some reports, the signing could take place as early as late 1993[17], and it was postponed due to internal political situation in Russia (the coup in October 1993 and parliamentary elections in December 1993).

The text of the contract was not published which gave rise to different interpretations of its content. According to some reports, the contract provided for the construction of one WWER-1000 reactor with a possible construction of the similar block in future[18]. Other reports indicated that the sides agreed on the construction of two WWER-440 reactors and the *upgrading* of two WWER-1000 reactors[19].

In fact, both were correct, since, as was disclosed by the Russian Minister of Atomic Energy, a Russian company had been contracted for completion of the construction (preparation and erection works)[20] and for installation of a 1,000-MW reactor there[21]. It had also been agreed that in future Russia would supply Iran with three additional reactors: one 1,000-MW and two 440-MW[22]. The period of implementation of the contract was 55 months[23].

It is not quite clear however what is going to happen with A-waste from the reactor supplied by Russia. Some observers say the contract stipulates that the waste should be returned to Russia for reprocessing upon which part of it should go back to Iran (highly radioactive waste) and part should remain in Russia (medium and low radioactive waste)[24]. This could be somewhat problematic however, since Russian Law prohibits import of radioactive waste. As reported, a high-ranking officer of the Ministry of Atomic Energy of Russia said that the sides were unable to agree on the use of nuclear waste, and the issue remained open.

The total amount of the deal is estimated at $800 million[25] to one billion dollars[26]. The deal consists of three parts: $780 million for assembling the reactor; $150 million for construction; $20 million for preliminary observation of the facility[27]. This is estimation per one reactor. With the other three the total amount will increase dramatically – according to some Western sources up to $8 billion[28] (which seems unlikely); and according to the former Minister Viktor Mikhailov – to $3.5 billion[29].

The protocol of negotiations between Russian Minister of Atomic Energy Prof. V.N. Mikhailov and Vice President of the Islamic Republic of Iran and President of OAEI Dr. R. Amrollahi was sharply criticized in the West[30]. Russia was accused of assisting Iran in creation of nuclear arms. The US and Israeli complaints can be summed up to the following:

- The Russian reactor may be used for creation of plutonium for military purposes;
- Uranium enrichment technologies and equipment will be used by the Iranians for military purposes[31];
- Cooperation with Iran in the field of atomic energy will enhance Iran's ability to work with nuclear material, which in turn will support their military nuclear program[32].

In reality, the Russian reactor is not capable of producing plutonium for military purposes: the plutonium-239 content in the waste fuel of WWER reactor does not exceed 56.5%, while for military use the content of plutonium-239 must be 93.5% or better 97%[33]. Theoretically it is possible to enrich plutonium to military condition. However, it requires construction of large factories. All doubts can be removed by the return of the spent nuclear fuel to Russia for reprocessing.

Contacts in the field of production and enrichment of the uranic ore date back to Soviet times. In October 1991 a Soviet delegation visited Iran and reportedly discussed possible production of uranium and other rare metals[34]. There was some development since the collapse of the Soviet Union: the Russian Federation agreed with the US arguments – part of the protocol relating to signing a contract for construction of a centrifuge factory contradicted international obligations assumed by Russia in the area of nonproliferation and will not be implemented according to the decree of the Russian President[35].

US argument that the Iranians will gain the experience necessary for creating their own nuclear bomb is viewed in Russia as an unjustified and unfair stance. Iran observes the Non-Proliferation Treaty. Moreover, Iran has agreed to the new rules of inspection under 93+2[36] program. All this makes Iran eligible to have access to nuclear technologies.

From the point of view of international law, the contract with Iran is flawless. Officials from the Russian Ministry of Atomic Energy worked very thoroughly on this specific matter – the Russian side had postponed the signing of all documents until Iran concluded the agreement with the IAEA which ensured full control over all nuclear sites in that country[37]. The deal satisfies the IAEA requirements, which fact was confirmed by the West.

Critics of the Russian-Iranian cooperation in the field of peaceful nuclear technologies started to stress not the legal side of the issue but the *expediency* of the deal. First, the USA made financial aid to Russia dependant on the rejection of the contract (formally, the US administration did not have any relation to this action – the idea of connecting the two issues was born in the Congress). The US Secretary of State[38] spoke of the connection between the rejection of the contract and the Russian participation in *G-7* meetings and the transformation of the group into the group of 8 nations *(G-8)*. In several off-the-record interviews some American officials even voiced a possible interlink of the *Bushehr* project with the ABM negotiations.

Second, the pressure was applied through discrediting Iran. Americans were attempting to convince Russian officials that Iran had a nuclear military program and that Iran was not able to fulfill financial terms of the deal[39].

None of the Russian-American high-level meetings and summits could avoid discussing the so-called *Iranian problem*. 1995 was the most difficult year in this respect. A week before the summit US Secretary of State Warren Christopher said that the USA was going to uncompromisingly persuade the Russians to stop cooperating with Iran[40]. During the summit President Bill Clinton was trying to convince Boris Yeltsin in the existence of Iran's military nuclear program. The Russian side made some concessions:

Russian President promised that the military component would be excluded from the Russian-Iranian accord[41].

It was thought that this matter would dominate the Gore-Chernomyrdin meeting, which was not the case[42]. In 1996, however, the topic was discussed during the negotiations at the Moscow summit on nuclear security. Anyway, the heat of the criticism somewhat subsided in 1996 which was connected with presidential elections in Russia and the subsequent inability of the Russian President to perform his functions. The criticism gained a new breath in 1997, especially during the visit to Russia of Israeli Prime Minister Benjamin Netanyahu[43]. The discussion centered on the issue of Iran's missile program[44].

A month after the Israeli prime minister's visit there was a meeting of Russia's President with the chairman of the Iranian parliament Ali-Akbar Natek-Nuri who was seen by Moscow as a leading contender for the presidential post in that country. Apparently, the Russian President assured his guest of Russia's intent to proceed with the deal[45]. During the visit of the Iranian foreign minister to Moscow (February 1998) the Russian side reiterated its intent to stand by the provisions of the contract[46].

The Russian Prime Minister replied to the American critics on the eve of his US visit, 'Moscow has never given Iran or any other nation missile and nuclear technologies, which would infringe the existing international norms.'[47]. At exactly the same time US Secretary of State Madeleine Albright was on a short visit to Kiev. Upon the visit the Ukrainians declared that they would not take part in the *Bushehr* project.

During the Gore-Chernomyrdin meeting in March 1998 the USA made implementation of several Russian-American projects in the sphere of space exploration dependent on the Russian-Iranian cooperation in the field of nuclear energy. The Americans conditioned the Russian participation in the *Alpha* project, as well as funding of several other Russian space programs[48] and increasing the Russian quote for the launch of international commercial satellites having American components by Russian space carriers[49], by the cancellation of the Russian-Iranian contract on the nuclear power station in Bushehr and the protocol on further cooperation. The Russian side, however, declined to give any assurances to that effect.

Russia began implementing the contract for construction of the nuclear power station in Bushehr in January 1996[50]. Initially, there were about 750 Russian specialists who worked on the site. Later their number grew to 1,000 people. Russia is prepared, along with completion of the two existing energy blocks, to begin the construction in Bushehr of two more – supplied with new Russian WWER-440 reactors. This was agreed upon during the visit to Teheran of the Russian delegation led by Vice Prime Minister Vladimir Bulgak[51].

It is still unknown whether the Russian Ministry of Atomic Energy had agreed with Iran upon the payment scheme and the bank through which the payments could be effected. Early in 1996, in accordance with the division protocol, implementation of the major part of the contract on manufacturing the atomic reactor was assigned to *Izhora* machine-building plant. *Podolsky* mashine-building plant, *Energomash* in Chekhov and *Atommash* in Volgodon were named as participants in the project. Part of the equipment, such as nuclear fuel transportation units, sluices, biological protection system and pressure compensator have been delivered to Bushehr.

Iranian personnel of the future station is trained at *Novovoronezhskaya* nuclear power station. The Russian side presumes it will complete the works within 55 months as provided by the contract, however, there has been a delay due to the fault of the Iranians[52]. As a result, some of the contractual provisions were changed: the dates remained the same, but a bigger part was assigned to Russia – in February 1998 Russia and Iran agreed that the construction would be a *turnkey project*[53]. Russia got the bigger part of the works after the visit of US Secretary of State Madeleine Albright to Kiev, a little after signing of the supplemental agreement

between Russia and Iran on the construction in Bushehr of two more energy blocks, and some time before the Gore-Chernomyrdin meeting. It is noteworthy that a little earlier, during his visit to Moscow, Ukrainian President Leonid Kuchma had reiterated his country's participation in the *Bushehr* project, although later Ukraine refused to supply *Bushehr* nuclear power station with turbines[54]. According to Russian statements, the refusal of Ukraine to participate will not have any significant effect on the implementation of the project[55]. The Minister of Atomic Energy and his first deputy Lev Ryabev claimed that there would be no problems with manufacturing turbines on Russian enterprises[56].

Early in April 1998 the Ministry of Atomic Energy announced that Russia was interested in the deliveries to Iran of a research reactor with a degree of enrichment of up to 20%[57]. Yevgeny Adamov explained this in the following manner, 'I don't want to see in 15 years from now that the political flirt that has begun today with the visit of American sportsmen to Iran will end up for example with the US supplying it (Iran) with a research reactor with 90% enrichment capacity. That is, with exactly the same fuel that is used for the military purposes.'[58]. This statement was widely criticized in the USA and Israel. *The Jerusalem Post* published an article claiming that Russia was allegedly supplying Iran with nuclear arms[59].

In May 1998 Russia was visited by Iran's Vice President Reza Aga-Zade who was also President of OAEI. During the visit Russian Minister of Atomic Energy additionally explained the objectives of the supply of the research reactor, 'I do not understand how a country can start exploiting such a complicated object as the nuclear power station without a research base. Our agreement provides for that.'[60]. The issue was not on the agenda of the meting because the Russian government did not authorize the Ministry to make such a deal[61].

Yevgeny Adamov put forward to the Iranians other options designed to broaden the cooperation, including a construction of another energy block from scratch[62].

The Russian side sees cooperation with Iran as mainly a commercial project. There is no indication that the Russian authorities or individual groups are pursuing any political goals, which could be prevailing over economic interests. Lev Ryabev, first deputy minister of atomic energy, put it this way, 'Yes, we are fighting for the market, but we are doing it in a civilized manner, in compliance with international rules, and none has been able to put forward to us any specific and proved claims.'[63].

**The current state of Iran's nuclear program**

Iran has two nuclear reactors: the five-megawatt American-made research reactor in the Teheran University (under the IAEA control); a Chinese-made research mini-reactor (of zero megawatt capacity), and two subcritical assemblages also supplied by China – in the Esfahan nuclear research center (subject to IAEA inspections).

There are other objects of the Iranian nuclear program:

- A non-working unit capable of producing the heavy water concentrate – Teheran University;
- According to some reports, in the Technological Sharif University (Teheran) there are working centrifuges design to enrich uranium of Iranian manufacture[64]; in November 1993 the object was visited by the IAEA delegation but it did not find anything suspicious[65];
- Sagan uranium resources in the Yazd province. The object was inspected by IAEA specialists who did not find anything suspicious[66];
- *Moallem Kalaye* object which is currently under construction; Western sources claimed an unauthorized activity here, however the IAEA inspection in its report in February 1992 did not confirm the existence of any nuclear-related activities there[67];
- *Kerej* nuclear research center for the needs of agriculture and healthcare; there is no evidence corroborating possible unauthorized activity[68].

The Iranian nuclear program is in an embryonic state. The country faces the same problems as in the late 80s: lack of the necessary equipment, qualified personnel and nuclear materials. Iran can solve these problems only through cooperation with other countries.

As the result of the US pressure almost all former partners discontinued joint work with Iran in the nuclear sphere. Only Russia and Cuba are ready to proceed.

**Iran's right to develop its nuclear program**

Iran has the legitimate right to develop its own national nuclear program. The country signed and ratified the NPT under which it has the right not only to independently develop nuclear energy but (NPT, Article IV) more developed nations are obliged to provide assistance in the field of peaceful nuclear energy.

This argument is being actively exploited by the Iranian side, sometimes in tough manner. For instance, in September 1994 Iran announced it could exit from the Treaty because the Western embargo constitutes a violation of Article IV of the Treaty which empowers all parties with the right 'to develop research, production and use of nuclear energy for peaceful purposes', as well as to the fullest possible exchange of equipment, materials, scientific and technological information[69].

Even some Western experts and observers acknowledge that Iran's position is justified. They also concede that the Russian reactors do not directly affect Iran's ability to develop a nuclear arsenal for military purposes because they will be under the IAEA control[70]. The US actions to prevent Iran from nuclear technologies may be viewed as justified only under condition if Iran violates its obligations under the Treaty, that is – create nuclear arms.

The summit of the *G-7* countries in Halifax in 1995 resolved that all countries should immediately stop their cooperation with Iran in case 'there is evidence of Iran's intentions to acquire nuclear arms'[71]. Incidentally, the resolution says about the *intention* to acquire nuclear arms which enables Western intelligence circles to organize leakage of information on Iran's intentions and to present such information as substantial evidence for halting cooperation with Iran. Such language allows Western leaders to disregard the IAEA reports and inspections which do not find any specific steps of Iran to create nuclear arms. Western interpretation is that Iran's intentions have not been translated into specific actions yet, which leads them to conclude they must be stopped from being translated into such actions: that is to say, to block Iran's ability to any nuclear technologies.

*G-7* resolutions cannot be viewed as legitimate documents of international law, and they cannot be binding for countries which are not members of the club. The document which provides Iran with the right to have access to peaceful nuclear technologies is the NPT. It would be fair to say, Iran has the right to ignore the resolution adopted in Halifax and to disagree with discriminatory measures introduced on the basis of that resolution.

To-date, there has been no evidence of Iran's involvement in any activity which contradicts the Treaty, despite various accusations to that effect.

Iran was accused in unlawful purchase of nuclear components on the black market in the 80s (in Khartoum)[72]. The same sources claimed that Israel also purchased nuclear materials there[73]. However, no sanctions have been introduced against Israel on the basis of such reports.

The CIA surmised that Iran made purchases of nuclear materials in the 90s, including from Russian sources[74]. IAEA inspections carried out in Iran during several past years have not identified the existence of illegal nuclear materials.

Iran was also accused in acquiring nuclear explosive devices. In 1992 there were reports that Iran allegedly bought medium-range nuclear warheads somewhere in Kazakhstan. These reports even quoted the amount of the deal – $130-150 million per one warhead[75].

However, neither the seller in Kazakhstan nor the type of the purchased warhead were identified. Seven years later these reports seem to have been fabricated for propagandistic purposes.

The CIA exploited such reports to prove that Iran was actively pursuing the task of acquiring nuclear arms, and in order to save time for achieving this, it intends now not to create but to purchase nuclear arms[76]. The Chinese People's Republic was named as one of Iran's major partners[77]. On this background there were reports that Iran will develop its own nuclear arsenal in five to ten years[78].

The US actions to block Iran's access to nuclear technologies have not made the possibility to infringe the provisions of the Treaty more difficult, but just vise versa. It has become easier to not observe such provisions in part of nuclear non-proliferation. The only reason to deny a country the access to peaceful nuclear technologies is the activities of that country aimed at creating its nuclear arms. But there have been no such evidence regarding Iran. Quite to the contrary, Iran has been active in promoting additional restrictions in the field of nuclear armament. Iranian officials have also promoted the idea of transforming the Middle East into a nuclear-weapon-free zone[79]. Together with other countries Iran several times voiced its support to the conclusion of the CTBT[80].

**Iran's military nuclear program**

Iran is accused of having an aggressive military nuclear program[81]. Such program dates back to Reza Shah Pahlavi – in the mid-70s a special group was set up to study how to develop nuclear explosive device[82]. The shah said in 1974 that Iran would have nuclear arms 'and faster than some people think'[83]. The shah later repudiated his statement[84].

Right after the revolution the military nuclear program was suspended. During the Iraqi war and in view of Israel's purported possession of nuclear weapons Iran, as some specialists claim, was planning a renewal of the nuclear military program. Occasional *leakages* from American intelligence sources give discrepant evidence about Iran's plans to renew its nuclear program: there was a report saying that it happened in the early 90's[85]; other reports say that Iran's military nuclear program restarted as early as in 1987 at Khomeini's personal directive[86].

There has been information about the Iranian government's prospective expenses related to the military nuclear program. The news came from an Iraq-based opposition group: in 1990 $200 million was assigned for it, and in 1991 this amount equaled $500 million[87]. We are not aware of any other sources confirming these data, nor do we have information on subsequent years.

The concept of a *military nuclear program* can be viewed in two aspects. First, as a desire to buy nuclear weapons, which can hardly be verified and in terms of the international law cannot be a reason to deny access to nuclear technologies. Second, as nuclear weapons production program and it implementation, which can be verified since it involves certain activities.

In order to create a nuclear explosive unit the following components are required:

- nuclear materials suitable for military purposes (HEU or plutonium extracted from nuclear power station fuel waste).
- high-tech explosive unit: the better the non-nuclear part of the unit is, the less nuclear material is required.

***HEU.*** Iran has about 900 grams of HEU at the Esfahan nuclear center[88]. This amount is insufficient to produce a nuclear explosive unit. At least three kilograms are required for one nuclear charge[89].

There has been information that in the mid-70's Denmark shipped 10 kg of HEU and 25 kg of natural uranium to Iran[90]. Reports also say that in the mid-80's Iran purchased uranium from a Namibia-based plant owned by a British company[91]. According to some *leakage* from the CIA, Pakistan supplied HEU to Iran in the mid-80's[92]. However, no detailed information is available.

There has been repeated evidence that Iran is engaged in uranium enrichment. In particular, Iran was suspected of such activities at two sites: Sharif Technological University and the *Sagana* uranium deposit. Both sites were inspected by the IAEA in the 90's, and nothing suspicious was detected. However, some specialists claim that 'it's too early for Iran to have such capacities at the present stage of nuclear weapons development'[93].

No uranium enrichment facilities were detected near uranium deposits[94]. Active centrifuges are located in Teheran, which implies transportation. Iran does not have a developed nuclear infrastructure. Most specialists agree that Iran is not capable of centrifuge uranium enrichment[95]. It has no technologies and capacities for chemical enrichment either. The laser enrichment method is not available in that country, even in the opinion of specialists who can hardly be called *pro-Iranian*.

Iran claims that it does not have enough uranium to enrich. The West thinks the *Sagana* deposit is a prospective source of raw material. According to Iranian information that has not been denied by the West, this deposit does not supply the necessary amount of ore[96].

Currently Iran does not have HEU reserves sufficient to produce a nuclear explosive unit. There are no legal chances to buy it abroad. Internally there is not enough technology and materials. What remains is illegal acquisition of HEU or uranium ore and ore enrichment technologies. A possibility of such attempts cannot be ruled out. Further isolation may fail to prevent them[97]. The only realistic variant is transparency of Iran's nuclear programs which is possible if only full access to nuclear technologies is given to the country and IAEA exercises full monitoring of the county's nuclear activities.

***Plutonium.*** For military purposes plutonium is extracted from spent nuclear fuel (SNF)[98]. It takes considerable amounts of SNF which can only be obtained from industrial nuclear power stations[99], and Iran does not have them. There has been no evidence of Iran's attempts to illegally buy plutonium. This is theoretically possible since plutonium reserves required for military purposes were available as early as the 80's in a number of countries (Argentina, Brazil, India, Israel, Pakistan, South Korea, Taiwan, and Yugoslavia).

Apprehensions that waste of nuclear power stations to be built in Iran may be used to extract plutonium for military purposes are quite justified. Although Iran is not in a position to extract plutonium out of SNF, it is purported to be able, given its level of the chemical industry, to master part of this technology, that is to conduct chemical reactions to extract plutonium, but it cannot turn it into stable metal, give it the necessary form, i.e. make it suitable for military purposes. In case Iran does not have nuclear power stations it will be impossible to create a plutonium bomb using its own resources.

Nuclear power stations do not imply that there are nuclear materials available for military purposes. Plutonium must be extracted out of spent nuclear fuel from nuclear power stations. The only condition when illegal channels can be curbed is transparency of Iran's nuclear program, which is available if access is granted to nuclear technologies. There is an alternative: either place the main emphasis on curbing plutonium smuggling or exercise control over spent nuclear fuel from nuclear power stations. Therefore it is possible to ensure control over spent nuclear fuel to rule out plutonium extraction.

So, at present Iran does not possess nuclear weapons and basic elements to create it. It was proved during an IAEA inspection[100]. However, there is no end to talk about Iran's nuclear military program: Iran is accused of plans to create nuclear weapons, and it is virtually impossible to verify it. On several occasions Iranian leaders made public the plans to create nuclear weapons in their official speeches, which gave rise to accusations of implementing secret military programs. For example, in October 1988 Hahsemi Rafsanjani, the then Parliament Speaker, said that Iran needed nuclear weapons. In late 1991 Iran's Vice-President

Atollah Mohajerani said that 'since our enemies have nuclear capabilities, the Muslim states should also have them.'[101].

Thus, Iran's nuclear military program is usually understood not as specific measures to acquire nuclear weapons, but as Iranian leadership's principle desire to acquire them.

**Preventing Iran's access to nuclear technologies**

There are two scenarios. Scenario 1: blocking Iranian access to nuclear technologies. In case external isolation is imposed smuggling of nuclear materials and technologies necessary to create nuclear weapons cannot be ruled out; it will not be easy to detect it given the secrecy of work, which is only natural in case of international isolation. Monitoring using national technical means may not be sufficient. Spot checks will tend to be less efficient as the program develops. Scenario 2: granting this access. Opening access to nuclear technologies at the moment when the nuclear program is in its initial stage makes it possible to reduce to the minimum a parallel *shadow* military program. Apart from potentially hazardous technologies the recipient country gets the system of controlling them as well.

Main efforts to ensure the nonproliferation order should not aim at controlling all spheres relating to nuclear weapons production, but at the principal ones, that is tracing nuclear materials.

Nuclear power stations do not imply availability of materials to produce a nuclear explosive, since plutonium must be extracted. Main efforts should be concentrated on control over spent nuclear fuel and preventing it from being processed into plutonium.

**Iranian missile program**

Iranian authorities do not deny reports on their interest to acquire missile production facilities (including production of medium-range missiles), but do deny categorically any help by foreign countries[102].

In 1984-1985 Iran started making great efforts to develop the missile program, the priority being production of surface-to-surface missiles. Iran's initial goal was reaching a missile potential sufficient to oppose neighboring Iraq[103], since for some time Iraq had an advantage in aircraft. This fact was aggravated by Iran's underdeveloped anti-aircraft defense.

Teheran, in all probability, continues to develop its missile ability to launch missile strikes against Israel and targets in Saudi Arabia. Iranian leaders announced Iran's intentions to include the Persian Gulf within the range of its missiles[104]. The launchers are to be located in Western Iran to make them less vulnerable. To achieve this a *double way* approach has been taken and a program is being implemented to produce surface-to-surface missiles on liquid and solid fuel.

***Solid fuel missiles*** are at present only unguided tactical systems. For example, Ohab with reported range of 45 km or Nazeat-10, reported range is 150 km. It is believed that Iran is currently improving its domestic development program in order to produce reliable control systems for them, and implementing long-term plans to develop solid fuel ballistic missiles with the range exceeding 1,500 km and 1,000 km[105].

***Liquid fuel missiles.*** In 1989 and 1991 Iran concluded a number of deals with North Korea on Scud-B (300 km) and Scud-C (500 km) missiles production technology. At early stages of the project implementation Iran will probably learn to assemble Scud missiles out of common semi-assembled sets. There is evidence that an Iranian delegation visited North Korea in spring 1993 to conclude a contract for 145 No-dong missiles (range over 1,000 km). Production technology, for which Iran paid about $500 million, is believed to be part of that deal[106]. In late 1993 the contract, according to information which needs to be verified, was suspended or terminated. There is evidence that it was initiated by Israel which is within the range of this missile[107]. In 1995 Iran started development of a 2,000-km missile[108]. Iran is evidently seeking help from various countries to further develop the long-range missile program.

On July 24, 1998 Iran tested a Shahab-3 missile with the range of 1,200 km. In all probability, this missile is a result of cooperation with North Korea. Technical characteristics of this missile make it reasonable to believe that Shahab-3 is a modification of No-dong.

***Cruise missile*** production is still unavailable for the third world countries, so Iran has made great efforts to purchase cruise missiles abroad, for instance, in China. Iran was planning to buy anti-ship S-802 and S-801 cruise missiles in China. These missiles were partially bought, at least S-801. American Defense Secretary William Cohen was quoted as saying that Iran had made two test launches of S-801 on June 3 and 6, 1997[109]. Under US pressure China had to give up further efforts to ship cruise missiles to Iran.

**Missile industry organizational structure**

The organizational structure of Iran's missile industry has not been revealed completely. Final responsibility is borne by *Sasaja,* the defense industry organization. This organization comprises Department 140 (*Sanam* industrial group), the main administrative body that manages research centers and production units. Some of the structures subordinate to that department are: Department 140/14 (*Shahid Baghari* industrial group, solid fuel missile program development), Department 140/15 (*Shahid Baghari* industrial group, liquid fuel missile program development), Department 140/16 (check-out equipment production planning, control and guidance systems development), Department 140/31 (*Parchin* missile industrial group).

In 1989 the ballistic missile program was controlled by *Vahid-E-Mashacheh*, a missile unit of the Guards of Islamic Revolution Corps. It is believed that both Iranian military offices have missile projects, and their work partially coincides.

**Iran's cooperation with foreign countries in missile programs**

Iran has all metal processing machinery and industrial equipment necessary to implement a missile program, but lacks control and guidance system technology. Iran is doing its best to fill this gap by acquiring double purpose technologies.

Iran can independently produce simple missile systems including guided ones, though their accuracy leaves a lot to be desired due to electronic-related problems. Engine modernization helped increase the range of Iranian missiles: in October 1997 Mr. Rafsanjani said that Iran could produce 250-km-range missiles[110].

The top priority of Iran's missile program is obtaining the necessary know-how and material and technical basis from other countries. Iran is believed to have ordered R&D abroad and afterwards received not only the research results but some ready item as well.

North Korea and China are the principal suppliers for the Iranian missile programs[111]. Owing to deals for Scud missiles, Iran, as is believed, has created basic infrastructure to produce liquid fuel ballistic missiles[112].

It may be assumed that Teheran's efforts to make purchases abroad are not centralized. Most authority is delegated to DIO that has contacts with necessary countries. Department 140/16 within DIO has business links all over the world and is known as an *instrument-making plant*[113].

Apart from Department 140 a number of other *DIO* departments are engaged in purchase activities: the Education and Research Institute (ERI), Department 148/3, sectors of the *MIG* mechanical system industrial group, Departments 142 and 158, special industrial groups of the Defense ministry (MIDSPCIG), Department 154 and University for Scientific and Defense Technologies (USDT, Department 149/d), some organizations outside DIO – the Iranian Research Organization for Science and Technology (IROST), universities of Shiraz and Mazandaran[114].

Suppliers that receive orders from a Teheran-based office are recommended to ship cargo to a location 50 km east of Teheran, near the *Parchin* arms factory, where a guidance and control systems plant is being built. The plant

is located north of the Asian highway near the town of *Shargfabad*[115]. To avoid export control the following tricks are used:

- false or misleading product description in official documents;
- false indication of the final user (for example, it is stated that the product will be used for civil production);
- *false* end users (*covering companies* or a suitable buyer like a university or a civil industry company);
- mediators' services (in Iran and abroad);
- forwarding the cargo through third countries.

USA has demonstrated its ability to effectively influence Iran's main partners, North Korea and China in missile programs. In this connection it is increasingly important to make Iran's missile program more autonomous. But this is a complex and long-term program. In its initial stages it is expedient, conversely, to expand the circle of external sources of technologies and final products. For this reason, in our opinion, the 90's saw an increase of Iranian emissaries' activities in Russia and the CIS.

In all probability, Iran is trying to reach complete independence in production of Scud-B and Scud-C. After the *No-dong* deal was suspended Iran must have counted on the former USSR countries' help in development of long range liquid fuel systems. China continues to render assistance to Iran in a number of directions, first of all, in guidance and control systems. Iranian programs in solid fuel long-range missiles also to a large extent depend on Chinese help.

**Russian-Iranian missile cooperation and Western pressure**

The West, first of all the USA and Israel, accuses Russia of missile deliveries to Iran[116], or at least of supporting the Iranian missile program[117]. There is evidence that certain Russian companies are really engaged in such cooperation. However, there is no information about state-effected or state-sanctioned deliveries by the Russian Federation to Iran of technologies or machinery in violation of the international regulations. On the contrary, Russian authorities are making serious efforts to prevent deliveries of missile equipment, spare parts and machinery to Iran.

***Early 1997.*** An attempt to manufacture units and spare parts for a liquid fuel missile engine under the guise of gas pumping station equipment at the *Kuznetsov* scientific and technical complex (the former NPO *Trud*) in Samara. The attempt was stopped by FSB when technical documentation was being prepared and the main contract had been signed[118].

***June 1997.*** An attempt to get from a Russian citizen secret materials on aviation equipment. Stopped by FSB[119]. There have been no details about the owner company of these materials. In all probability, it was TsAGI[120].

***November 14, 1997.*** An attempt to get design documentation on missile equipment from a Moscow-based enterprise. When handing over the information the technical representative of the Iranian Embassy in Moscow Reza Teimuri was arrested[121].

***Late March 1998.*** Azerbaijani customs officers detained a consignment of alloy steel delivered to Iran from Russia. According to American sources this steel was intended for fuel tanks of Scud missiles[122].

Special attention should be given to information about contacts between TsAGI and *Sanam* which were established in 1994. In 1996 *Sanam* enquired TsAGI about its ability to take part in determining aerodynamic characteristics of an atmosphere-probing rocket. On April 16, 1996 TsAGI advised *Sanam* to turn to *Rosvooruzheniye* as it had no authority to hold official negotiations[123]. Later on the *Sanam* company turned to TsAGI and requested technical assistance to establish an aerodynamic research center in Iran. In May 1996 TsAGI conducted preliminary technical negotiations without assuming responsibilities[124].

In September US Secretary of State Madeleine Albright handed a document to Russia in which Russia was accused of

delivery to Iran of SS-4 (P-12 in Russian classification) missile engines. In February 1997 *The Los Angeles Times* published a report with references to American intelligence sources that Russia was going to ship to Iran SS-4 ballistic missile production technology[125]. Later details were revealed that Russia was going to help Iran in modernization of these missiles that Iran's army is armed with[126].

Although there are accusations that Russia is making headway towards missile rearmament of Iran at a state level, nevertheless the West now begun to take a *differentiated* approach. The fact is that Russian military industry enterprises make unauthorized deliveries of missile equipment to Iran in violation of international agreements in this area and bypassing Russian official structures. The Clinton Administration considered imposing sanctions against several Russian companies and research institutes as early as 1997, without applying these sanctions to the Russian government 'as it may sometimes fail to control these processes'[127].

An instance of this approach became the 1998 and 1999 sanctions against ten Russian companies. In April 1998 the US State Department made up a *black list* of companies and organizations suspected of missile technologies to Iran[128]: it contained about 20 Russian companies and organizations, according to unofficial sources. In late July 1998 a decision was made to impose sanctions against seven Russian companies: NPC INOR, *Grafit* Research Institute, Baltic State Technical University, the *MOSO* company, *Europalace-200*, *Glavkosmos*, *Polus* Research Institute. Two weeks prior to that decision the US Administration made public the list of nine companies against whom sanctions might be imposed. On January 12 US Assistant to the President for National Security Affairs Samuel Berger addressed the Carnegie Conference on nuclear nonproliferation and said that he was authorized to announce that the President had imposed sanctions against three Russian institutes: MAI, MUTHT, NIKIET.

At the same time the Russian government issued a resolution on January 22, 1998 No. 57 "*On the Improvement of Controls over the Export of Dual-Use Goods and Services Related to Weapons of Mass Destruction and Missile Delivery Vehicles.*" and "*Methodological Guide on Internal Export Control System in Companies and Organizations*" which was adopted on May 12, 1998 by the Russian Federal Service for Currency and Export Control. It is an alarming sign, however, that many companies that should be guided by these documents in their foreign economic activities were critical about them. The main argument here is that following the prescribed procedures will impede foreign economic activities, which is currently the main source of income. So, there is a collision: the state's attempts to toughen export control is criticized by those over whom this control is exercised, since the state does not finance them properly, and they have to place main emphasis on foreign contracts. In fact, this problem can be solved only if an export control system is organized. This is a problem related to Russia's economic and scientific policies.

**Conclusion**

Iran, being a country possessing considerable geopolitical and geo-economic potential is not capable at present to fully utilize it. An Oriental bureaucratic model prevails in the country, this model is not adequate for efficient work, but can successfully imitate active work. This is the main difficulty in determining the real military and technical potential of Iran and seeing how advanced Iran's military and technical programs are.

Iran is no closer to nuclear weapons production than 20-25 other countries[129]. However, preventing Iran from having nuclear weapons is a task that should not be ignored. Iran's scientific and technical potential does not make it possible to take in imported technologies (legal and illegal) at a scientific level. That is why it is not technologies that Iran is trying to acquire but final products (drawings, production plans). In this way it, on the one hand, saves resources, on the other hand, justifies funds allocation to its programs since this model makes it possible to pass off the final

product, which is actually only duplicated from the drawings, as its own invention.

The present-day level of cooperation between Iran and Russia (and even some expansion of it within the framework of Russia's international commitments) cannot help Iran make a technological breakthrough that will lead Iran to a new level in the military industry. Iran is a prospective market for Russian technologies. However, competition on this market is limited due to American restrictions. Most likely, these restrictions are not going to be forever. In that case Russian proposals may become non-competitive.

Pressure exerted on Iran using the potential intentions factor proves that mechanisms of preventing weapons of mass destruction spread is not effective enough; that is how the situation is viewed in many countries including the USA. The situation around Iran shows that the international export control system is influenced by a political situation, and that it should be developed based on principles which would guarantee equal access for developing countries, who are undergoing industrial modernization, to new technologies, including the *sensitive spheres*.

We can hardly speak about selective principles in forming an efficient prevention of WMD proliferation. Serious damage was done to concepts of limiting Iran's access to military technologies by the recent US-Israeli agreement on joint efforts in WMD nonproliferation which virtually legitimizes Israel's nuclear status. It appears that this *de facto* inequality of countries in WMD technologies is brought about by American interpretation of political stability in the Middle East.

In its turn, this conclusion brings us back to the factors that made Iran adopt an active missile program and suspicions regarding its activities in the nuclear sphere. It appears that most of these factors are related to the regional instability and that there is a number of outstanding military and political problems of paramount importance. First of all, these are outstanding military and political issues between Israel and a number of relatively strong (in the political and military senses) Islamic having serious geopolitical ambitions.

The main conclusion that can be prompted by studies of the problems relating to Iran's activities in critical technologies is that fundamental problems causing the international community's anxiety about gossip of any sort, expert estimations and suspicions, can only be resolved in a broader geopolitical context: by creating an efficient regional security and arms control system. All attempts to solve problems using sanctions and agreements between external powers to deny Iran's access to critical technologies cannot produce the desired result. Moreover, being to a large extent deprived of political and psychological legitimacy of perception, they may lead to crises between Russia and *G-7*, first of all the USA.

The Russian-Iranian cooperation is politically (not legally) vulnerable because, above all, the two countries lack other common interests in their relationship apart from cooperation in critical technologies, including nuclear power engineering and the military technical program: one may think that the whole agenda of Russian-Iranian cooperation is limited to the *sensitive* goods and technologies only. Furthermore, as a result of Russia's continuing system crisis as major destabilizing factor, both in bilateral relations and in perception of Russia in the world, is a low level of geopolitical responsibility of Russian exporters and manufacturers who value their profit higher than the state interests.

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## Analysis

# INDIAN NUCLEAR SUBMARINE FLEET DEVELOPMENT PROGRAM: RUSSIAN PARTICIPATION

**by Dmitry Litovkin,**
**PIR Staff Writer**


*Translation into English. Abridged version*

According to our experts, among all perspective military projects in India, the largest one is a build-up of the Navy, especially its nuclear submarine component.

By 2004, India is expected to accomplish a large ship-building program aimed at creation of national nuclear submarine fleet. New Delhi plans to have five nuclear submarines capable of carrying missiles with nuclear warheads. In this connection, Indians being strongly oriented in their military development to technical cooperation with Russia, were reported as willing to purchase ships and equipment from their key partner. At the moment, according to some Russian and foreign experts, the national program for development of sea-based missile Sagarica (meaning "oceanic" in Hindi) is still a far cry. Sagarica appears to be an anti-ship underwater-launched cruise missile being developed with direct participation of certain Russian design offices.

According to the First Scientific Research Institute of the Russian Navy in St. Petersburg studying development trends of Russian and foreign naval forces, the Indian Navy have been built up as follows: in 1950-1968, India mainly acquired surface warships decommissioned from the British Navy. In 1968-1971, it started buying weapons and military equipment from the USSR and developing self-dependent production of certain items. Within that period, India purchased from the USSR 8 submarines of *I641* and *I641K* series (in 1967-1974), 8 corvettes of *159 AE* series (in 1969-1974), 8 guided missile boats of *205E* series and several auxiliary ships. Within 1968-1975,

with the technical assistance of British companies *Vickers* and *Jarrow,* India initiated building of 6 *Leander* type frigates at *Mazagon* shipyard in Bombay.

The next period of Indian Navy reinforcement began in 1983-1990, when it purchased from the USSR five destroyers of *61ME* series (in 1983-1988), three corvettes of *1234E* series (in 1983-1984), six base type minesweepers of *1258E* series (in 1983-1984), 8 submarines of *877EKM* series (in 1985-1990), and from West Germany - four *209/1500* type submarines, two of which were built at *Howaldtwerke* shipyard in Germany, and two others - at *Mazagon* shipyard in Bombay with German technical assistance.

At present, the Indian Navy has all major types of warships: aircraft carriers, destroyers and frigates, armed with missile and artillery or only artillery weapons, antisubmarine corvettes, diesel powered submarines, missile and conventional type boats, minesweepers. According to Russian military experts, Indian leadership considers Navy as one of the main tools for turning the country into a leading regional power, and is prepared to use every effort to reach that target.

At the same time, the declared peacetime mission of the Indian Navy is the protection of the 12-mile territorial waters and 200-mile economic zone. In case of war, the Indian Navy should be ready to counteract operations of its neighbors, i.e. Pakistan and China. Therefore, the top-priority agenda of naval development for the nearest future includes increasing of the number of warships and their modernization, as well as technical improvement of weapons and Navy equipment.

These plans are based on India's willingness to build the lacking ships on its own at national shipyards or buy them abroad. At that, Indians do not rule out the possibility of purchasing not only ships, but also technical documentation for their production under license. The only difficulty impeding implementation of these plans is insufficient development of certain key industries like non-ferrous metallurgy and electronics, poor industrial equipment, low productivity, research and development. These are the problems that stipulate for the necessity of purchasing modern ships, weapons and new military technologies from abroad, and from Russia in particular.

The backbone of Indian submarine forces is nine diesel powered submarines of *877 EKM* series (*Kilo* class by NATO classification) designed by *Rubin* design office in St. Petersburg, and several similar type submarines of *209/1500* type, built by German *JKL* company. At present, the government enterprise *Admiralteiskiye Verfi* (St. Petersburg) finishes building of the tenth *Kilo*-class submarine for the Indian Navy. This ship will include certain innovations enhancing its combat capabilities. First of all, it will be armed with Biryuza anti-ship subsonic cruise missile system.

On December 26, 1997, the same enterprise started building two diesel powered submarines of new generation (*Amur-1650* series) for the Russian and Indian Navy. The concept used in *Amur* series enables various modifications of the ship through variation of its armament and the use of anaerobic power plants. All those issues have been discussed with Indian Naval Command and it was agreed that the warships would be built not only in Russia, but also at Indian shipyards under license.

Such is the official aspect of military cooperation of the two countries. Still, according to the estimates of some of the experts involved, its shaded area is none the less important, and it deals with India's desire to have nuclear submarines.

There are different versions of what is going on in this sphere. One of them belongs to Rear Admiral Vyacheslav Apanasenko, the acting Chief of Staff, Deputy Chief of the Department of Shipbuilding, Weapons and Operation of the Russian Navy. According to him, there were no deals with India in the field of leasing Russian nuclear submarines recently, and the Russian Government got no official requests from India on the part, and 'there can be no activities on preparing

nuclear submarines for rent or sale without routine bureaucratic formalities'.

Last time, the issue of leasing nuclear submarines was raised in the late 1980s. Then, in January of 1988, India rented the Soviet nuclear powered attack submarine of *670A Skat* series (*Charlie* class by NATO classification) with eight Ametist (SS-N-7 Starbright) anti-ship missile launchers for three years. In the Indian Navy, the ship was called *Chakra*. The submarine was manned by a Russian crew training Indian seamen to operate it.

*670 Skat* project (nuclear powered submarine with cruise missiles) was started in 1960 in Gorky by *Lazurit* design office headed by Chief Designer V.P. Vorobyov. Skat having 4,980-ton displacement and 100-men crew was the first Soviet nuclear powered submarine armed with Ametist (SS-N-7 Starbright) anti-ship underwater-launched missiles with the flight range of 120 km, manufactured by NPO *Mashinostroyeniya*. The submarine could be used in combat operations against aircraft carriers and other big warships, transports and escort ships at oceanic and sea lanes.

The main armament of the ship included 8 Ametist (SS-N-7 Starbright) anti-ship missile launchers, capable of carrying nuclear warheads and mounted outside the firm hull (four on the starboard and four on the port side). Four 533-mm and four 400-mm torpedo launchers were placed in the submarine bow. Target designation for the anti-ship cruise missiles and torpedoes was provided by Kerch hydro-acoustic system. The submarine was equipped with a surface buoy-type antenna ensuring reception of radio messages, target parameters and satellite navigation signals while being at a big underwater depth.

The distinctive features of the design were a fusiform hull as well as a single-shaft, single-reactor (*VM-4* type water-cooled and water-moderated reactor) low-noise 19,000-hp power plant. The speed of the submarine was 26 knots submerged. Successful technical solution combined with optimized weapons system enabled the ship to efficiently place fire at air attack groups and easily penetrate enemy's anti-submarine defense lines. It were those high performance characteristics that attracted attention of the Indian naval officers who were choosing a nuclear submarine most appropriate for the Indian Navy. Later, Skat became not only training ground for the Indian Navy personnel, but a design laboratory for developing and testing indigenous nuclear submarine technologies.

Upon expiration of the ship leasing term in 1991, the submarine was returned to Russia and decommissioned from the Russian Navy. Officially, since that time there were no talks on further cooperation in that sphere. However, the fact of India's leasing nuclear submarine is noteworthy and deserves a more detailed study, for it were Russian seamen who taught Indians to operate the submarine, and the former *apprentices* have taken key posts in Indian design offices developing nuclear submarines.

The nuclear submarine development program has been implemented in a number of scientific research centers of the country: New Delhi, Hyderabad, and Vizag. The code name of the project is *Advanced Technology Vessel* (ATV). So far, the program has been under-financed and moving up too slowly, but since India performed a series of nuclear tests, it enjoys a growing interest and Indian military have succeeded in getting the 15% increase in the defense budget for 1998-1999. Today, it totals 412 billion rupees or $10 billion. Such tremendous financial support of the Indian military program has resulted in the beginning of a new series of five nuclear submarines at national shipyards, two of which will be launched already in 2004.

The Indian nuclear powered attack submarine has about 4,000-ton displacement and a single-shaft nuclear power plant of Indian origin. In due time, India bought from Canada the license for production of nuclear reactors, and reportedly it can be used for manufacturing nuclear power plants for submarines. Apparently, the rest submarine characteristics will be similar to *670* series, which allows to predict specifications of the weapons systems to be used. If we assume that so far India has no indigenous anti-ship

cruise missiles and the submarine is being built with participation of a Russian design office as a consultant, all major weapons systems may be of Russian origin.

Nowadays, the government-owned company *Rosvooruzheniye* exports a number of sea-based cruise missiles. The first in the list is the 3M-80 Moskit anti-ship supersonic cruise missile (SS-N-22 Sunburn) being sold only as the armament for *Sovremenny* type destroyers of *956* series, which can be used only on the surface. The second item is the Kh-35 (SS-N-25) anti-ship subsonic cruise missile (similar to American Harpoon cruise missile), meant to be used with small guided missile boats. The third item is already mentioned Biryuza anti-ship cruise missile; still, due to its short range, it is considered as a submarine self-defense weapon rather than an attack missile.

In theory, to gain the highest efficiency from the use of anti-ship cruise missiles meaning the best attack results and effective penetration through the air defense system of a modern surface ship, it is necessary to launch at least eight missiles simultaneously. In a submarine modification, Biryuza missile system has only two launchers.

Therefore, the most probable missile for the Indian submarine would be the actively promoted at all international exhibitions Yahont anti-ship cruise missile designed by NPO *Mashinostroyeniya*, the above-mentioned manufacturer of all major Russian sea-based anti-ship cruise missiles. Yahont meets all principal requirements to anti-ship missiles of the fourth generation: low weight and dimensions (8 missiles can be placed in the hull of a slightly modernized *Amur*-class submarine, or it can replace four P-15 Termit (SS-N-2a Styx) anti-ship cruise missiles on boats of *205* series), uses the Stealth technology, has supersonic flight speed and a completely independent guidance system based on the *fire-and-forget* concept.

Yahont is an operational missile designed for hitting complex sea-based and inshore targets. A ship armed with Yahont missiles can carry out combat operations against single middle class ships (e.g. destroyers) or carrier battle groups of the enemy.

The flight speed of Yahont missile is 2.5 Mach number (similar to Moskit (SS-N-22 Sunburn) missile), and the range is about 300 km (or 120 km at altitudes 5 to 15 m). A regular midcourse phase of the flight occurs at 15 km.

Yahont is aimed by an inertial guidance system based on preset target location data. At a pre-calculated flight point (25-80 km), a brief turn-on of the homing scanner occurs, resulting in exact determination of target location. Next time, the homing system turns on when the missile leaves the radio horizon and loses its altitude to 5-15 m, i.e. a few seconds before hitting the target.

Missile designers assume that the enemy would detect the launch of the missile at the distance of 300 km and take measures to destroy it. However, being resistant to jamming, having the flight velocity of 750 m/s and making complex maneuvers during flight, Yahont cruise missile shall anyway reach the target. There are no effective means of defense against this Russian missile in naval forces of the world.

It is not the high speed or jamming protection that make Yahont the advanced weapon system. Its major advantage, not too much advertised by NPO *Mashinostroyeniya* representatives, is the guidance system which has accumulated all NPO experience in developing electronic systems of artificial intelligence, enabling to fight against single warships (*one missile - one ship*) or a group of ships (a *flock* against a group). It is salvo launching that shows all unsurpassed tactical capabilities of the Russian weapon.

The missiles allocate and range targets by their importance and choose the attack implementation plan. The independent control system keeps in memory not only the electronic counter- and countercountermeasures (ECM and ECCM) data, but also the methods of evading the fire of enemy's air defense systems. Having destroyed the main target in a group of ships, the missiles left attack other ships of the group, eliminating the possibility of using two missiles on one target.

Nuclear powered submarines being built at Indian shipyards allegedly resemble by their body outlines the Russian fourth generation submarine Severodvinsk designed by *Rubin* design office in St. Petersburg. This vessel is being constructed for the Russian Navy at *Severny* machine-building plant in Severodvinsk.

The same plant is now busy with repairing two Indian diesel-powered *Kilo*-class submarines. Certainly, one can't be sure that these facts are somehow correlated, but if we assume that they are, then India is presumably prepared to acquire or already has acquired technical documentation for building ships like those designed by *Rubin*. In that case, India has to purchase also the Yahont anti-ship cruise missiles, designed specifically for *Severodvinsk* type nuclear submarines.

The presence of nuclear powered submarine of the fourth generation equipped with Yahont cruise missiles in the Indian Navy would enormously raise its technical capabilities. Neither country in the region would have so powerful and well-armed warships. China being a most likely rival of New Delhi in the arms and economic race, even having *Sovremenny* type destroyers with 8 Moskit anti-ship cruise missiles (SS-N-22 Sunburn), aircraft carriers and diesel powered *Kilo*-class submarines in its navy forces, could not compete with the Indian Navy.

After India has informally joined the *nuclear club,* it strives for possessing not only tactical nuclear weapons jeopardizing interests of Pakistan and China. Military experts assume that the wish to purchase nuclear powered attack submarine is caused by the Indian desire to represent real power in the political dialogue with the USA. Having warships with unlimited range armed with powerful missile weapons capable of carrying nuclear warheads, the Indian Navy will play an important role over the world's sea-lanes.

Thirty years of Russian-Indian military and technical cooperation have determined the process of weapons systems development of our Asian partner. Military experts emphasize that the Indian military step by step repeat all development stages of the Russian Armed Forces. If we follow this logic, then we should remember that the idea of using nuclear powered submarines with cruise missiles in the Russian Navy has always been linked with their number, i.e. there should be enough submarines to counteract each enemy's carrier battle group. The Soviet Union had to build about 20 ships to provide for efficient deterrence of US carrier battle groups. But even for the USSR building nuclear submarines one by one, getting of two nuclear submarines with cruise missiles on board used to cost more than one aircraft carrier of *Admiral Kuznetsov* type. In this connection, questionable is the adequate financing of ambitious Indian naval projects.

Another important issue in the task of deterring the US Navy has always been the fact that any sea target is mobile and can easily change its position. Due to this, the USSR had to deploy a large-scale satellite system for sea observation and target location, because successful use of anti-ship cruise missiles assumes having real-rime target data. Only in that case the missile weapon becomes really efficient. India has no space segment, yet strives for its creation. Should this happen, Indian nuclear submarines would become a political pressure instrument, as New Delhi dreams. So far it is only the first trial of strength in developing an ideal carrier for nuclear weapons, equally irritating all members of the *nuclear club*.

According to information available to our experts, interested in purchasing Russian nuclear submarines are other countries besides India, like China, Brazil and South Korea (in the last case, the USA will probably block this contract). Should these agreements be signed and approved at the higher political level, they would be implemented by the two major submarine design offices of Russia, i.e. *Rubin* and *Lazurit*.

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## Editorial



## Hot Topic



## Interview



## Information



## Documents



## Analysis