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TACTICAL NUCLEAR WEAPONS

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Executive Summary

Tactical nuclear weapons (TNW) represent a considerable part of the arsenals of the existing nine nuclear-armed states, though they have no agreed definition and elastic criteria. In the US/Russia context, they are perhaps best defined as those nuclear weapons not covered by existing bilateral strategic arms limitation and reduction treaties. The arsenals of the other NPT NWS are mostly strategic, while those of the four non-recognised nuclear-armed states are all non-strategic. It must be noted in those cases, however, that nuclear weapons, which under Russian-American criteria are classed as tactical, have for their owners a strategic character.

None of the nuclear-armed powers, with the exception of Great Britain, provide any official data regarding their non-strategic nuclear capability. Publicly available data is based on unofficial estimates. The US is thought to have 500 deployed TNW, most of them in NATO countries. Russia is thought to have around 2000 though it is not clear how many are operationally deployed. China has 100–130, while most of the remaining nuclear-armed states probably have 80 or less—in the case of the DPRK, no more than 10. Britain has none.

Since the end of the Cold War, holdings of TNW in the NWS have been reduced unilaterally, rather than via arms control treaties. Significant reductions were made under the unilateral 1991 and 1992 US and Russian ‘Presidential Nuclear Initiatives’ (PNI), though full implementation of these proved difficult and costly. US abrogation of the ABM Treaty and the collapse of the 13 steps plan adopted by the 2000 NPT RevCon, made further implementation of the PNI all but impossible.

TNW are nonetheless still subject to certain arms control regimes which limit their horizontal, and to a lesser extent vertical, proliferation. The most important is the NPT which bans all parties, apart from the NWS, from acquiring nuclear weapons, including TNW. But a range of other multilateral treaties prohibits the stationing of any nuclear weapons, including TNW, on the seabed, in Antarctica, in space and on the Moon and other planets. This is also the effect of the various treaties creating regional nuclear weapon-free zones around the world.

Vertical proliferation of TNW is limited by various treaties relating to nuclear testing. The voluntary moratorium on testing before the CTBT comes into force in particular has severely restricted those countries most interested in modernising their TNW arsenals. Another serious barrier to TNW would be negotiation of an FMCT, but this has been stalled for over a decade.

The question of TNW remains particularly important in Europe. The eastward expansion of NATO has not, apparently, been accompanied by any eastward movement of TNW. But US plans to station missile defense systems near Russia’s borders have aroused serious concerns

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in Moscow, and raised the spectre of a new nuclear stand-off in Europe in coming years.

US TNW stationed there also make them an attractive target for terrorist groups. Moreover, the potential delivery of US TNW to targets by non-nuclear-armed NATO members appears to be a clear breach of their NPT undertakings.

At the very least, the US should remove its remaining TNW from Europe, and both Russian and the US should remove them from Air Force and Naval bases and consign them to centralised storages on national territories. Later on, if the talks on an FMCT and then FMT are successful, the physical elimination and utilization of tactical nuclear warheads from storages could be implemented in a verified way, together with strategic nuclear warheads, within the context of advanced nuclear disarmament treaties.

Criteria for tactical nuclear weapons

Tactical nuclear weapons represent a considerable part of the arsenals of the existing nine nuclear-armed states: USA, Russia, Great Britain, France, China, India, Pakistan, Israel and the Democratic People's Republic of Korea (DPRK)². In most cases, tactical nuclear weapons are not covered by the agreements for the limitation and reduction of weapons.

There is no clear and universal definition of tactical nuclear weapons. Within the context of Soviet/Russian–American nuclear arms control, the definition was formulated only at the end of 1980s after a series of bilateral treaties for the limitation, reduction and banning of certain types of nuclear weapons.

In this bilateral context, during the first stage, strategic nuclear systems were differentiated from the non-strategic. At the end of the 1960s, when the Soviet Union and the United States began negotiations aimed at limiting strategic nuclear weapons, they had to separate from among the many types of nuclear weapons they possessed at that time those systems which they intended to reach an agreement upon. When separating these types of nuclear weapons, they used a criterion of range in relation to each other's territory. On this basis, they defined missiles as strategic intercontinental if they were capable of reaching the main territory of the USA from bases located in the USSR, and vice versa; that is, with a range of over 5500 km. Even here the criterion of the range had a hypothetical character. Tactical missiles launched from Alaska, after flying some tens of kilometers across the Bering Strait, could strike targets in Chukotka, on the USSR's territory.

² The Nuclear Non-proliferation Treaty 1968 (NPT) recognised as nuclear weapon states only those states which had carried out nuclear tests before the Treaty came into force, that is, USA, Russia, Great Britain, France and China. India, Pakistan and Israel were never members of the NPT. The nuclear status of India and Pakistan, which carried out a series of nuclear tests in 1998 and which declared themselves to be nuclear weapon states, is not recognised. However, in 2008, the Nuclear Suppliers Group removed some restrictions on nuclear trade with India, in the area of peaceful use of nuclear energy. Thus a beginning was laid for a *de facto* recognition of its nuclear armed status. Israel has never declared that it has nuclear weapons but it has also not denied their possession. Its inclusion among unrecognised nuclear armed states is now generally accepted. In 2003, after its illegal nuclear activities were discovered, the DPRK left the NPT, and in 2006 carried out a nuclear test. The international community aims to denuclearise the DPRK and is conducting relevant negotiations. In principle, Pyongyang has agreed with the necessity of its denuclearisation.

Nuclear armed ballistic missiles launched from submarines (SLBMs) were defined as strategic weapons. Here the striking range of the missile was not taken into account because the submarine had the ability to secretly approach a coastline of the other party at a distance that would allow a ballistic missile to strike targets on the enemy's territory.

The criteria for heavy bombers (HB) are mainly based on their flight range. Bombers which are capable of reaching major military–industrial regions of the Soviet Union from the territory of the USA, and vice versa, and capable of returning back to their base, were defined as strategic. Here this criterion also had a hypothetical character. Medium range American bombers and fighter bombers based in Western Europe or Japan had the ability to strike targets on the USSR's territory and then return to their bases. In theory, Soviet bombers could also use air fields in Cuba. In the 1970s, the USA expressed its concern regarding the medium range Soviet bomber, the TU-22M "Backfire". Washington considered that it had enough range to reach American territory. In order to address this concern, the Soviet Union agreed not to equip such aircraft for mid-air refuelling.

It is worthwhile noting that having accepted the above criteria for differentiating strategic and non-strategic weapons, Moscow had in fact agreed to accept the American point of view. The Soviet Union had the capability of striking the territory of the USA by only those means that were named as strategic, and subject to limitation in accordance with bilateral agreements. At the same time the USA could destroy targets on Soviet territory by non-strategic nuclear weapons located along the borders of the Soviet Union. The United States invariably resisted the inclusion of the forward-based delivery means under the umbrella of Soviet–American control of nuclear weapons. They pointed out that these means were intended to neutralise a substantial superiority of the Warsaw Pact countries over NATO in conventional troops and weapons.

The hypothetical nature of separating strategic and non-strategic weapons constantly created situations of mutual concern due to the arrival of weapons belonging to a "grey area". Aside from the already mentioned problem with the medium range TU-22M "Backfire" bomber, a question arose during the 1980s over long-range sea-launched cruise missiles (SLCM). These missiles themselves were not ballistic and had a range over 600 km but, being submarine-based, they could strike targets on the Soviet Union's territory. Disagreements about these systems introduced considerable complications during the negotiations of the 1979 Strategic Arms Limitation Treaty (SALT-2) and 1991 Strategic Arms Reduction Treaty (START-1).

In the second stage, tactical nuclear weapons were separated from the non-strategic systems at the end of 1980's, after the conclusion of the Intermediate and Short-range Nuclear Forces Treaty (INF), which was signed in Washington in December of 1987¹. This document, which is of indefinite duration, envisaged mutually verified destruction of the whole class of nuclear weapons possessed by the USSR–USA, namely ground-based ballistic and cruise missiles with a range of 500–5500 km. However, this document did not address air- and sea-based systems of both countries which had a similar range. In the 1990s, these systems were taken off combat alert in

accordance with unilateral initiatives adopted by both Moscow and Washington (see below).

Thus, within the contemporary Russian–American bilateral context, we can designate as tactical nuclear weapons those systems that are not subject to limitations and bans under agreements for strategic and medium-range missiles, among them:

- Any nuclear delivery vehicles, including land-based missiles, with a range less than 500 km;
- Sea-based cruise missiles with nuclear warheads and a range of less than 600 km;
- Air-based cruise missiles with nuclear warhead, and nuclear gravity bombs that are not carried by heavy bombers.

If we extend the criteria developed in the framework of Soviet–American control of strategic weapons to other countries, then the main arsenals of Great Britain, France and, partially, China can be classed as strategic. All British operational warheads are deployed on submarines’ ballistic missiles of the *Trident-2* type, procured in the United States and designated as strategic. In France, at the base of its nuclear forces, there are various types of locally produced SLBMs. However, during the Cold War period, Paris also designated as strategic weapons a small number of land-based medium-range ballistic missiles deployed in the south-eastern part of the country on the Albion plateau, as well as its *Mirage* medium range bombers. These systems could deliver a nuclear warhead to targets located in the European part of the USSR. Currently all “non-strategic” French weapons could be defined as “tactical” (see below).

China has a few ICBMs falling under the definition of “strategic” and capable of striking targets in the USA and the European part of the Russian Federation. China is also attempting to deploy SLBMs. So far it has not been entirely successful. However, the basis of the PRC’s nuclear weapons lies in its non-strategic forces, both tactical and medium range. They are capable of striking targets on the territory of the Russian Federation in the Asian part of the country.

The nuclear forces of the three unrecognised nuclear-armed powers—India, Pakistan and Israel—are fully non-strategic. As in the case of the PRC, they comprise a combination of tactical nuclear weapons and medium and short range missiles. It is supposed that Israel and possibly India have the technical capability to create strategic ICBMs but are refraining from this in order to avoid unnecessary complications with the United States and Russia. It is unlikely that the DPRK, which tested a nuclear explosive device in 2006, has so far managed to convert it into a weapon which could be deployed on a missile. It is likely, however, that the North Korean nuclear explosive devices could be delivered to their targets by aircraft. So these devices could, with some qualifications, be then considered a tactical nuclear weapon.

It must be noted that nuclear weapons, which in accordance with the criteria of Soviet–American arms control agreements come under the definition of tactical, have for a number of their owners a strategic character. Thus, for Pakistan, India’s tactical nuclear weapons have a strategic character because they are capable of striking its main cities (Karachi, Lahore, Rawalpindi, and Islamabad) which are based less than

500 km from the Indian–Pakistani border. The same can be said about Israel whose opponents are the Arab world and Iran. In order to strike targets in this region it is sufficient to have just “tactical” range.

Tactical Nuclear Arsenals

None of the nuclear-armed powers, with the exception of Great Britain and France, provide any official data regarding their non-strategic nuclear potential. Publicly available data is based on unofficial estimates made by various organisations and experts. They are therefore not necessarily reliable and have to be approached with caution. Estimates for non-strategic nuclear arsenals in different countries are given in **Table 1**.

Table 1. The size of non-strategic (tactical) nuclear arsenals of different countries, 2008

Country	The number of non-strategic weapons, in units (data rounded)	Country	The number of non-strategic weapons, in units (data rounded)
Russia	2000	France	60 (60)
USA	500	Pakistan	60 (?)
China	130–200	DPRK	10 (10)
Israel	80 (80)	Great Britain	0
India	60–70 (?)	Total	2900–2980

Source: *World Armaments, Disarmament and International Security*. SIPRI Yearbook 2008, Oxford University Press, 2008, pp. 366-398.

Note: (estimates of tactical nuclear weapons are based on criteria arising from the framework of Soviet-American nuclear weapons control).

In accordance with data provided by the *Stockholm International Peace Research Institute* (SIPRI) at the beginning of 2008, the USA had 500 operationally deployed combat-ready tactical nuclear weapons. Among them around 400 air bombs are deployed on 7 airbases in 6 European countries (Great Britain, Germany, The Netherlands, Belgium, Italy and Turkey). These weapons can be delivered to their targets not only by American bombers but by aircraft of other NATO member countries, in particular by the F16 fighter planes from Belgium and Netherlands, and also by German and Italian *Tornado* bombers.

It is worthwhile noting that estimates of the number of American tactical weapons in Europe have increased significantly during the past few years. In the beginning of the current decade their stockpiles were estimated at around 150 units. Considering the existing lack of transparency, it is not clear whether this reflects an increase in the estimates of real quantities of weapons, or whether it is linked to some kind of political agenda.

One hundred of the W80-0 class weapons are intended for *Tomahawk* SLCMs, and an additional 190 warheads for these missiles are held in reserve. These systems may be deployed on nuclear submarines of the *Los Angeles* and *Virginia* class. Currently, they are stored on shore but can be deployed on nuclear submarines within 30 days after a decision to deploy them. All the *Tomahawk* SLCMs are stored at the naval bases at Kings Bay (Georgia) and Bangor (Washington).

Aside from the 500 tactical operational nuclear weapons, the USA has 1155 similar weapons kept in reserve. If necessary, they can be operationally deployed. Additionally, in 2007, the Bush Administration made a decision to restore capacity for production of nuclear weapons. After the end of the Cold War, the United States had ended their industrial scale production. Only a few units were manually assembled each year.

While SIPRI continually reviews downward their estimates of American non-strategic weapons, its estimates of Russian tactical nuclear weapons remain fairly high. This is possibly connected with the fact that in Russia there are no estimates of the number of tactical nuclear weapons produced locally, while in the USA there are a number of research institutions compiling such estimates. The unofficial international data regarding American stockpiles of nuclear weapons are based on precisely these estimates.

According to SIPRI, at the beginning of 2008, Russia had approximately 2,000 operational non-strategic nuclear weapons. Almost half of them (around 900) were meant for deployment in air defence and submarine defence (“ground-to-air” missiles C-300, SA-N-1/6, SS-N-15/16, depth bombs, torpedoes). More than 500 weapons can be deployed on Tu-22M mid-range and Su-24 fighter bombers. Additionally, nearly 300 weapons may be deployed on more than 100 aircraft belonging to the naval air strike force. Around 280 weapons can be deployed on SLCMs. It is interesting that in so far as SIPRI is concerned, Russia does not have combat-ready nuclear warheads for land-based tactical missiles, and also nuclear artillery shells and landmines. At the same time, the Russian navy allegedly still has tactical nuclear stockpiles deployed. This does not match the declarations made in 2000 by Igor Ivanov, then Russian Foreign Affairs Minister. He stated that all naval nuclear weapons had been relocated to centralised storage facilities, while weapons belonging to the Army could still be operationally deployed (see below)ⁱⁱ. This undermines trust in the estimates regarding the size and structure of the Russian tactical nuclear weapons stockpiles made by the Stockholm Institute. But even these data support the fact that after 1991 the number of deployed Russian tactical weapons was reduced by more than 10 times (see **Table 2** on p.13).

After the end of the Cold War, Great Britain abandoned its non-strategic nuclear weapons (air bombs and submarine-based weapons). Instead, a portion of the *Trident* missiles that fall into the category of “strategic” was assigned to non-strategic tasks. Additionally, British bombers were capable of carrying American nuclear bombs located in Great Britain until their final removal in mid-2008.

About 1/6 of the French nuclear weapons are in non-strategic forces. Approximately 50 warheads are for air-to-ground missiles deployed on land-based medium range *Mirage-2000N* bombers. Additionally, 10 more warheads may be deployed on similar

missiles which are carried by *Super Étendard* bombers based on the aircraft carrier *Charles De Gaulle*. France is the only nuclear country still deploying nuclear weapons on surface vessels. After the end of the Cold War, France, like Russia, USA and Great Britain, took steps to reduce its non-strategic potential. Thus, it had totally abandoned land-based medium and short-range missiles.

China's non-strategic nuclear forces are represented by approximately 70 single-warhead DF-3A and DF-21A medium range ballistic missiles (MRBMs). The latter is a comparatively new system; its deployment started in 1991. Apart from this, the PRC has an unknown quantity of DF-11 and DF-15 short-range ballistic missiles (SRBMs), capable of carrying nuclear warheads. In 2007, the deployment of DH-10 cruise missiles was initiated, with their deployment on Hong-6 bombers, as well as in the land-based version. At the beginning of 2008, their number was estimated to be 15 units. And finally, around 40 air bombs may be delivered to target with medium range and obsolete Hong-6 bombers³, and by Qian-5 strike aircraft.

In accordance with the definition developed within the framework of the arms control process, medium range Chinese bombers, SRBMs, and cruise missiles are designated as tactical nuclear weapons. This comprises no fewer than 55 warheads (plus an unknown number deployed on SRBMs). Thus, China's tactical nuclear arsenal most likely exceeds that of the French. If one adds to it MRBMs (more than 70 units), then in terms of an overall non-strategic potential China takes third place in the world after Russia and the USA. However, after the end of the Cold War, Beijing also showed restraint. The quantitative estimates of its nuclear potential during this period have remained practically unchanged, while its modernisation was carried out at quite a moderate pace.

During the past 10 years, an obvious tendency to increase the number of nuclear weapons was observed only in three of the non-NPT nuclear-armed states—India, Pakistan and the DPRK. As a result of the arms race on the South Asian subcontinent, the size of India's and Pakistan's nuclear potential became comparable to France's non-strategic potential.

India's nuclear force is estimated at 60–70 nuclear weapons. The highest estimate is 100 weapons. All of them were manufactured after this country carried out its nuclear tests in 1998. They can be delivered to target by *Prithvi-1* SRBMs and *Agni-1*, and *Agni-2* MRBMs. The *Agni-3* MRBM is in the testing stage. India also has sea-based ballistic missiles of the *Dhanush* class. Its test launches were conducted from surface vessels. In 2008 a *K-15* SRBM was tested from an underwater stationary platform. Medium range *Mirage-1000H Vajra* bombers and, in part, *Jaguar IS Shamsher* strike bombers may also be used for carrying out nuclear raids. In theory, Russian-made *MiG-27 Bahadur* and *Su-30MKI* fighter planes can carry nuclear weapons. Additionally, the *Su-30MKI* are equipped for mid-air refuelling from an *Il-78* tanker airplanes.

In accordance with the Russian–American classification, a great part of India's arsenal is represented by *Agni* medium range systems, while aircraft may be designated as a tactical arsenal, in addition to *Prithvi* SRBMs and *Dhanush* MRBMs.

³ In PRC *Hong-6* bombers are most likely designated as strategic.

The *K-15* could possibly represent a prototype of an SLBM and cannot be designated as a tactical nuclear weapon.

In accordance with the SIPRI information, Pakistan has approximately 60 nuclear weapons. All of them have also been manufactured after nuclear tests were conducted in 1998, and can be delivered to target by ballistic missiles and by fighter planes. Pakistan has 2 types of SRBMs (*Hatf-3 Ghaznavi* and *Hatf-4 Shaheen-I*), and *Hatf-5 Ghauri* MRBMs. The *Hatf-6 Shaheen-2* MRBM is in its testing stage. The *Ghauri-2* MRBM is being developed. All of these systems are ground-mobile and solid-fuel. They have been operationally deployed from the middle of the current decade. The ground-based *Hatf-7 Babur* cruise missile is undergoing testing. It is claimed that this rocket is technically similar to the Chinese DH-10. *Babur* is being developed in both air-based and sea-based versions. The latter can be deployed on submarines of the *Agosta* class.

Relatively large scale efforts in the area of missile construction were undertaken by the government of former president Pervez Musharraf (who was dismissed in 2008). It is assumed that Pakistan's missile programme is being developed with the active cooperation of the DPRK and, in the past, the PRC. In theory, apart from ballistic missiles, Pakistan's nuclear weapons can be delivered to target by the US-manufactured *F-16 A/B* fighters, the French produced *Mirage-V* fighters and the *A-5* manufactured by China.

Israel is estimated to have 60–80 nuclear weapons, 30–50 of which are MRBM warheads, and 30 are deployed on aircraft. If these estimates are correct, then the size of Israel's nuclear potential is either comparable to or exceeds the non-strategic nuclear weapons stockpiles of France, as well as the nuclear arsenals of India and Pakistan. Israel has 50 *Jericho-2* MRBMs capable of striking targets in the south of Russia. On 17 January 2008 Israel tested the *Jericho-3* MRBM. This system is assumed to be a 3-stage hard fuel missile, with a maximum striking range of 4800–6500 km, and payload of 1000–1300 kg. If this is correct, it may signify Israel's departure from its policy of voluntarily limiting the range of missiles to stay short of intercontinental ballistic missiles capabilities.

Apart from this, US-made *F-16* fighter planes (modifications A, B, C, D and I) are capable of carrying nuclear weapons, and Israel has 205 such aircraft. Israel has at its disposal three *Dolphin* diesel-powered submarines, manufactured in Germany, and in 2006 Israel ordered 2 more submarines. It is assumed that torpedoes on these submarines were restructured as SLCMs launchers.

In case the operational deployment of *Jericho-3* missiles is achieved, Israel will become the first non-NPT nuclear-armed state possessing strategic nuclear weapons. Currently, the whole of its arsenal is non-strategic. With the exception of its *Jericho-2* MRBMs, other systems may be classified as tactical.

In October 2006 the DPRK conducted a nuclear explosion which, in the opinion of most experts, was not fully successful. Nonetheless, the DPRK may possess a number of nuclear explosive devices. These devices may be delivered to their targets by aircraft, and also by submarines. In the latter case they may either be exploded on board the submarine or on the enemy's shore after they have been secretly offloaded.

Another possibility would be to try to deliver a nuclear explosive device on a truck through a tunnel that is dug out under the demilitarised zone on the border with South Korea. However, this scenario has little probability because the chance of discovering such a tunnel is high. It is generally agreed that North Korea so far has not been able to miniaturise its nuclear explosive devices to allow their deployment on ballistic missiles. It is estimated that North Korea possesses hundreds of Hwasong SRBM and a few dozen *No Dong* MRBMs. Testing of the Taep'o-dong ICBM was unsuccessfulⁱⁱⁱ.

Multilateral regimes limiting TNW

Despite the fact that, after the end of the Cold War, tactical nuclear weapons in the four recognised nuclear weapon states (except China) were significantly reduced, this process moved forward mainly through unilateral initiatives, rather than through the legal arms limitation treaties. Nonetheless, despite some widespread opinions to the contrary, tactical nuclear weapons are subject to a whole range of international arms control regimes.

These regimes are, in the main part, relevant specifically to tactical and other non-strategic weapons. Would-be proliferators would gain initial access to non-strategic weapons and only then decide whether they needed strategic weapons. As noted earlier, in a number of cases they do not see the necessity for possessing strategic systems at all.

Of greatest importance here is the 1968 *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT). Other international agreements prevent deployment of nuclear weapons in particular geographical regions: Antarctica (*The Antarctic Treaty*), Latin America (*Treaty of Tlatelolco*), the southern part of the Pacific Ocean (*Treaty of Rarotonga*), Africa (*Pelindaba Treaty*), South East Asia (*Bangkok Treaty*), and Mongolia (which proclaimed itself as a nuclear weapons free zone).

It is frequently asserted that as a result of the conclusion of multilateral treaties for the creation of nuclear weapon-free zones, the whole of the Southern hemisphere may be considered free of nuclear weapons. This is not quite so because not all of these agreements have come into force (for example, the *Pelindaba Treaty*). Additionally, such treaties do not cover international waters and air space, which remain open for ships and aircraft carrying nuclear weapons on board. Nonetheless, the very fact that such zones were created demonstrates the commitment of most countries of the world to their non-nuclear status, and facilitates the strengthening of nuclear non-proliferation norms in developing countries.

Unfortunately, Western countries demonstrate a double standard in their approach to non-nuclear zones, and are inclined to look at their creation through the prism of their own military and political interests. Thus, they have in practice blocked the creation of such a zone in Eastern Europe because membership in such a zone of a number of countries, which are members of NATO, would make nuclear planning in this organisation more difficult. On the other hand, they have by all means supported the creation of a non-nuclear zone in Central Asia. Banning the deployment of nuclear weapons in this region would complicate the provision to countries in this region of

security guarantees within the framework of the Collective Security Treaty Organisation (CSTO).

Concerning the regimes that limit vertical proliferation, they include first of all international regimes for banning and limitation of nuclear testing. In accordance with the 1963 Partial Test Ban Treaty such tests are banned in three areas: on earth, in the atmosphere, and under water. Although not all nuclear states acceded to this document, in 1998, India and Pakistan and, in 2006, the DPRK, not being bound by its limitations, have preferred to carry out their nuclear tests underground.

In 1996 the *Comprehensive Nuclear Test Ban Treaty* (CTBT) was opened for signature. It completely bans all nuclear tests. It has not come into force, most of all because of the obstructionist policies of the George Bush Administration, which had not gone beyond the US signature of this document. Nonetheless, after 1998 all countries (with the exception of the DPRK) have been adhering to a voluntary moratorium on carrying out nuclear tests.

A serious contribution to the process of limiting the growth of tactical arsenals of non-recognised nuclear-armed states, and also to the prevention of acquisition of nuclear weapon status by non-nuclear countries, may be made by the proposed international convention to ban production of fissile materials for nuclear explosives (FMCT).

Therefore, current and future regimes for non-proliferation of nuclear weapons are on the whole capable of having the greatest impact on tactical nuclear arsenals. The firming up of arrangements achieved with the DPRK regarding the abandonment of its nuclear programme would be possible if the DPRK returned to the framework of the NPT as a non-nuclear state. The coming into force of the CTBT and the signing of an FMCT would place a limit on the increase and modernisation of non-strategic arsenals of unrecognised nuclear powers through legal international means when currently these countries are totally outside any regimes for limiting nuclear arms. Moreover, had these documents acquired universal character, a difficult barrier would have been erected, preventing non-nuclear states from acquiring nuclear weapons, including tactical ones. They could not legally produce fissile materials necessary for creating such weapons. Moreover, with the possible exception of Israel, no nuclear-armed state has acquired its nuclear status without carrying out nuclear tests.

Presidential nuclear initiatives by Russia and USA for TNW, 1991 and 1992

In 1991 and 1992, the Presidents of the USA and USSR/Russia proposed unilateral parallel initiatives for eliminating a considerable number of the operational tactical nuclear weapons of both countries, with their subsequent partial destruction. In Western literature these proposals are known as *Presidential Nuclear Initiatives* (PNI)^{iv}. These initiatives were voluntary and non-compulsory in a legal sense, without any formal connection to the response of the other party. On the one hand, this allowed their reasonably quick implementation, and such implementation did not depend on a usually complicated and lengthy negotiating process. On the other hand, the above-mentioned initiatives were not verifiable, while the absence of a legal framework could allow, when necessary, the withdrawal from unilateral obligations

without an explanation of the reasons for it and without going through the internal legal procedures for denouncing an international agreement.

The first PNI was announced on 1 September 1991 by then US President George Bush. On 5 October the USSR's President Michael Gorbachev announced his "response measures and counterproposals". His initiatives were further developed and fleshed out in President Yeltsin's proposals of 29 January 1992. The US President's decision envisaged:

- Withdrawal of all tactical nuclear weapons of land-based delivery vehicles (nuclear artillery shells and warheads for *Lance* tactical missiles) to US territory, including from Europe and South Korea, for their subsequent dismantling and destruction;
- Elimination from naval surface ships and submarines of all tactical nuclear weapons and also depth charges of the naval air force, their storing on the territory of the USA and the subsequent destruction of half of their numbers;
- Cessation of the development programme for short range missiles of *SRAM-T* type, intended for arming tactical strike aircraft.

The response measures on the part of the USSR and then Russia were as follows:

- All types of tactical nuclear weapons carried by ground troops, air force and air defence forces were moved to manufacturing plants and centralised storage facilities;
- All weapons intended for ground forces must be destroyed;
- A third of weapons intended for sea-based forces were to be destroyed;
- Half of the nuclear weapons for surface-to-air missiles were to be eliminated;
- The future intention was to reduce by 50% the remaining stockpiles of nuclear weapons for the tactical air force;
- It was proposed, together with the USA, to remove from air forces and place in centralised storage facilities the remaining nuclear weapons intended for attack aircraft^v.

It is very difficult to give a quantitative measurement of these reductions because, as opposed to the information on strategic nuclear forces, Russia and USA did not publish official information regarding their tactical nuclear weapons. In accordance with unofficial published estimates, the USA should have destroyed as a minimum about 3,000 tactical nuclear weapons (1300 artillery shells, more than 800 warheads for *Lance* missiles and about 900 warheads for sea weapons, mainly depth charges). Gravity bombs intended for the air force were retained. The overall number at the beginning of 1990s was estimated to be 2000 units, including about 500–600 air bombs stored in Europe^{vi}. The overall estimate of the current tactical nuclear arsenal of the USA is provided in Table 1 above.

In accordance with the estimate of one Russian study, within the framework of Russia's PNI, the plan was to eliminate 13,700 tactical nuclear weapons, including 4000 warheads for tactical missiles, 2000 artillery shells, 700 weapons of the engineering corps, 1500 warheads for surface-to-air missiles, 3500 air force weapons, 1000 weapons for naval vessels and submarines, and 700 weapons of naval aircraft.

This would comprise almost two-thirds of the tactical nuclear weapons that the former USSR possessed in 1991^{vii}.

It is difficult to overestimate the scale of the PNI. First of all, for the first time a decision was taken to dismantle nuclear weapons themselves and not just their delivery means, as was done in accordance with START-1. Some classes of TNW were destined for complete destruction: nuclear shells and rockets, nuclear warheads for tactical missiles, and nuclear land mines^{viii}. Secondly, the scale of reduction significantly exceeded the direct limits that were built into the START process. Thus, in accordance with the current START-1 treaty of 1991, Russia and USA had to reduce 4000–5000 nuclear warheads or 8000–10,000 units altogether. Reductions within the framework of PNI could potentially eliminate more than 16,000 weapons.

From the beginning, PNI implementation encountered serious difficulties. During the first stage in 1992 it was linked with the withdrawal of former Soviet tactical nuclear weapons from the territory of former Soviet Republics. Withdrawal of these types of weapons to Russian territory was agreed upon in the mainframe documents for the disbanding of the USSR, signed by the leaders of the newly independent states in 1991. However, a number of former Soviet Republics were creating obstacles for such a withdrawal. In particular, in February 1992 the Ukrainian President L. Kravchuk put a ban on the withdrawal of nuclear weapons to the Russian Federation. Only joint pressure by Russia and the USA made him renew the transportation of these weapons. In the spring of 1992 all tactical weapons were moved to Russia. The withdrawal of nuclear warheads for strategic vehicles was completed only in 1996.

Another complicating element was linked to the extremely difficult economic situation that Russia found itself in during the 1990's, with serious difficulties for funding the dismantling of nuclear weapons. Disarmament activities were also slowed by the absence of sufficient capacities in storage facilities. This led to overfilled storage facilities, and violations of security standards^{ix}. Risks of unauthorised access to nuclear weapons during their removal and storage forced Moscow to accept international aid in order to maintain nuclear safeguards. This aid was mainly given by the USA under the Nunn–Lugar threat reduction assistance program. Primarily, it was aimed at improving security of weapons and weapon-grade materials storage sites. The assistance was also provided by a number of other countries, including France and Great Britain. Striving to maintain its state secrets, Russia refused to accept any cooperation while dismantling nuclear weapons. However, foreign aid was given in other, less sensitive areas. For example, containers for secure transportation of nuclear weapons were provided. This freed up funds necessary for the destruction of weapons.

The provision of foreign aid had insured a unilateral and partial transparency that was not envisaged by PNI. The donor states, and above all the USA, insisted on their right of access to facilities for which their aid was used in order to verify that the equipment supplied was used for the purpose intended. As a result of long and difficult negotiations, mutually acceptable decisions were reached which would, on the one hand, guarantee the inviolability of secrets and, on the other hand, provide the necessary level of access. These transparency measures involved important facilities such as those used for dismantling and assembly of nuclear weapons that were

managed by Rosatom, and also facilities for storing nuclear weapons that were managed by the Russian Ministry of Defence.

The last officially published information on the implementation of the PNI in Russia was given in the speech by then Russian Minister of Foreign Affairs Igor Ivanov during the NPT Review Conference on 25 April 2000. In his words, “Russia... continues consistent implementation of unilateral initiatives in the area of tactical nuclear weapons. Such weapons are completely removed from surface vessels and multi-purpose submarines and also from land-based naval air force, and are placed in centralised storage facilities. One third of the overall number of nuclear weapons for sea-based tactical missiles and the naval air force was liquidated. The destruction of tactical missiles’ nuclear warheads, artillery shells, and nuclear mines is nearing completion. One half of nuclear warheads for surface-to-air missiles and one half of nuclear air bombs were destroyed.”^x

Estimates on Russia’s Implementation of PNI are given in **Table 2**.

Table 2. Unilateral obligations by Russian Federation under PNI 1991-92

Type of weapons	Deployed by USSR in 1991, number of weapons	Subject to reduction under PNI, number of weapons	Completed by 2000, number of weapons
Ground forces:			
1. Missile forces	4000	4000	Near completion
2. Artillery	2000	2000	Near completion
3. Engineering corps	700	700	Near completion
Air Defence	3000	1500	1500
Air force	7000	3500	3500
Navy:			All weapons transferred to centralised storage facilities
1. Vessels, submarines	3000	1000	1000
2. Naval Aircraft	2000	around 700	around 700
Total	21,700	13,400	

Source: A. Arbatov, *Reduction of Non-strategic nuclear arms, tactical nuclear weapons*. Chapter in: *Nuclear Arms and Security of Russia*, Moscow, IMEMO RAS, 1997, p. 56. *Conference reviewing implementation of nuclear Non-proliferation Treaty*. Speech by I. S. Ivanov. 25 April 2000. *Diplomatic Courier Journal*, May 2000. Electronic version available on http://www.mid.ru/dip_vest.nsf/99b2ddc4f717c733c32567370042ee43/25de7700e9ba953ec32568ef0027c951?OpenDocument

Thus, as of 2000, Russia had fully implemented PNI as regards TNW intended for the navy. As planned, all naval nuclear ammunition was relocated to central storage facilities and a third of it was destroyed. A number of tactical nuclear weapons were still held by ground forces, the air force and air defence. In the case of the air force, this did not contradict PNI because, in accordance with the January 1992 initiatives by President B. Yeltsin, it was envisaged that a portion of tactical weapons would be retained and that they would be decommissioned and destroyed, together with the USA weapons; but the USA had not done this. As for the liquidation of air force weapons, the obligations were fulfilled by 2000. Obligations to destroy air defence weapons were fulfilled, but the remaining warheads were not completely de-alerted. Thus, during the 1990's Russia had fulfilled PNI in relation to the air force and navy weapons, and partially, air defence weapons. Insofar as obligations regarding ground forces are concerned, a portion of tactical nuclear weapons still remained in the inventory and was not destroyed, although PNI prescribed their complete removal to centralised storage facilities and complete destruction.

The implementation of PNI became one of the requirements for the NPT Review Conference of 2000. Their realisation was an integral part of the "13 steps" plan for fulfilment of obligations of the nuclear weapons powers, in accordance with Article VI of the Treaty. The "13 steps" plan was adopted during the conference by consensus, i.e., representatives of the Russian Federation and the USA both agreed with it.

However, nineteen months after the end of the 2000 Review Conference, Washington announced its unilateral withdrawal from the 1972 Russian–American agreement on the limitation of anti-missile defence systems (*ABM Treaty*), which was considered as the cornerstone of strategic stability. This decision was made in violation of commitments by the USA under the "13 steps" plan, which required observance of this agreement. Violation by one of the NPT member states of commitments on a number of decisive points adopted by the Review conference of 2000, the "13 steps" plan, made other members reluctant to fulfil their obligations as well. During the proceedings of the 2005 NPT Review Conference, no provision was adopted regarding the "13 steps" plan, which means that it had, in fact, lapsed. This could not but affect the implementation of PNI.

Thus, on 28 April 2003, in a speech by the Head of the Russian delegation at the Preparatory Committee of the 2005 NPT Review Conference, the following statement was made: "The position of the Russian party is that it is impossible to discuss questions of tactical nuclear weapons separately from other types of arms. The known unilateral Russian initiatives in the field of disarmament 1991–1992 are of a comprehensive nature and, among others, affect tactical nuclear weapons and other important questions which significantly affect strategic stability."^{xi}

Reference to the fact that PNI affects, besides TNW, other important factors influencing strategic stability, points to the interrelationship, from the Russian point of view, between the implementation of the 1991–1992 initiatives and the fate of the *ABM Treaty*. Additionally, the assertion that "the problem of TNW cannot be discussed separately from other types of arms" is obviously a hint about a linkage with the adapted version of the *Treaty on the Conventional Forces in Europe* (CFE) entering into force.

This Treaty was signed as early as 1990 and envisaged maintaining a balance between forces in Europe on the basis of military blocs. After the collapse of the Warsaw Treaty Organisation and the USSR itself, it quickly became obsolete. In order to maintain this important document, parties, during the greater part of 1990's, conducted complex negotiations regarding its adaptation, which were concluded by the signing in Istanbul in 1999 of an adapted version of CFE. This version paid greater regard to the military and political realities in Europe after the end of the Cold War, and contained certain guarantees for Russia's security by limiting deployment of troops by third countries around its borders. However, NATO refused to ratify the adapted CFE, using contrived arguments. Considering the existing significant imbalance in conventional weapons benefiting NATO *vis-à-vis* Russia, the question of the role of nuclear weapons, including TNW, serving as a means for neutralising this imbalance, became relevant again.

As there have been no further official statements regarding the fate of PNI, it may be concluded that these initiatives were not implemented in full. This demonstrated clearly both the advantages and disadvantages of informal regimes in arms control. On the one hand, within the PNI framework considerable reductions in tactical nuclear weapons were implemented, including the destruction of nuclear warheads. It is likely that a great part of the weapons that were meant for destruction were in fact destroyed. However, the absence of verification measures does not allow parties to say with any degree of certainty exactly what reduction in numbers really took place. At the same time, the absence of a legally binding status made it easier for parties to stop implementing the initiatives without making public announcements on the halt.

Growing relevance of TNW in Europe

In Europe, after the accession to NATO of the Baltic States, the problem of tactical nuclear weapons control became more acute. The buffer that separated Russia from NATO disappeared; territories of NATO member-states surrounded the Kaliningrad region. Also, the Baltic States are located in close proximity to both Russian capitals, Moscow and, in particular, St. Petersburg. The narrow depth of defence, an extremely short missile and strike aircraft flight time, if they are placed in Latvia and Estonia, and a most serious overall imbalance benefiting NATO in terms of conventional arms and forces, cannot but attract Russia's attention to tactical nuclear weapons as a means for neutralising Western superiority, both quantitative and operational.

It must however be emphasised that so far, the NATO eastward enlargement has not been accompanied by the deployment of nuclear weapons and their most destabilising delivery means to the territories of new member states of the Alliance. So far Brussels has on the whole observed the provision of the Russia–NATO Founding Act, signed in 1997, which contains a clear obligation in the provision that the Alliance does not intend to deploy nuclear weapons on the territory of the new member countries. This document is not legally binding but its political importance makes obvious violation of its provisions difficult.

However, in 2006 the Bush Administration announced its plans for deploying by 2011 its third missile defense area in Poland and the Czech Republic. That means the relocation of the anti-missile detection radar from Kwajalein to the territory of the

Czech Republic and also construction of anti-missile silos in Poland, just a few kilometers from the border of the Russian Federation. For interception missiles, it is proposed to deploy ground-based interceptor (GBI) type systems, assembled from two stages of *Minuteman* ICBMs.

In Russia, these plans have aroused serious anxiety due not only to the possible strategic imbalance, but also to the fact that systems, which are to be deployed in Poland, may have tasks that are different from those that are announced. These antimissiles theoretically have the ability to strike not only ballistic missiles on their flight trajectory, but also ground targets. The flight range of a two-stage rocket is equal to the flight range of a medium-range missile. In other words, there are suspicions that attempts are being made to bypass the Intermediate Nuclear Force (INF) Treaty, prohibiting and eliminating short and medium range missiles. Such missiles are feared as having the potential for a surprise disarming or “beheading” strike on key command and control facilities that are located in many parts of European Russia, with a flight time in the order of five minutes. Although the INF Treaty has provisions exempting the ballistic missiles of such range if these are created and tested for BMD or Air Defence purposes (Art. VII), Moscow may be very conservative in its assessments and project the worst case scenario, as far-fetched or unlikely as it may be.

In November 2008 President Medvedev announced Russia’s intention to respond if American missiles appeared on Polish territory. One such response was the deployment of *Iskander* tactical missiles in the Kaliningrad region. These missiles are dual purpose, i.e. they can be used both with conventional and nuclear warheads. The Russian President did not say whether these missiles will be of the nuclear or non-nuclear type.

Thus, the absence of legally-binding agreements on TNW in Europe, alongside erosion of other international legal regimes for arms limitation, has brought about a real danger of the revival of a nuclear standoff on the European continent as early as the beginning of the next decade. Such developments can be forestalled not only by political dialogue about missile defense, but also thorough control over tactical nuclear weapons.

In the middle of the 1990’s, the USA made it known that, under certain conditions, it was ready to accept legal obligations regarding non-deployment of nuclear weapons on the territory of new NATO member countries, if Russia agreed to some limitations in turn. In 1997, in the Helsinki Declaration of the results of the Russian–American summit, the parties managed to place on record a provision regarding the start of consultations on limiting tactical nuclear weapons. However, later disagreements over the ABM Treaty did not allow Russia and the USA to make progress in this area.

In addition to the *Founding Act*, deployment of nuclear weapons by the USA in Central and Eastern Europe is made difficult by the PNI and the *INF Treaty*. In accordance with Article VI of the NPT, all nuclear states must, in a spirit of goodwill, conduct negotiations on nuclear disarmament. Tactical weapons are no exception.

Russia, in principle, has declared its readiness to continue dialogue with interested countries for further nuclear disarmament, not excluding limits to TNW. However, as

the initial precondition for the start of negotiations on TNW, Moscow presumes that other countries too would follow the example of the Russian Federation and would not deploy their nuclear weapons outside their national territory. Under discussion are around 400 American gravity nuclear bombs stored in six European countries, five of which are non-nuclear-armed members of the NPT.

In accordance with current estimates, American nuclear weapons in Europe consist of obsolete gravity bombs. It is not known if they are equipped with locking devices that could stop unauthorised access to them. Possible vulnerability of these weapons to terrorists becomes even more serious, considering the activities of various extremist groups in Europe, including those connected to Al Qaeda.

Great Britain posed a particular problem here as major terrorist acts in the last few years there were committed by British citizens of Muslim origin. "Internal terrorism", based on radical Islamist ideology, has a great capacity for planning and carrying out terrorist activity to a greater extent than terrorists of foreign origin. "Internal terrorists" know their country better, know the location and vulnerability of particularly important facilities, and also have better connections which could facilitate their access to such facilities or into organisations that might attack them. The superimposition of radical Islamist ideology on "internal terrorism" is particularly important because, as opposed to traditional "internal terrorism", it encourages its supporters to seek out the most catastrophic types of terrorist acts, including nuclear.

The fact that the USA and its NATO allies are not ready to give up finally the relics of the Cold War and to withdraw a few hundred obsolete warheads from Europe, which represent a certain terrorist risk, is particularly disappointing against the background of a uniquely secure environment that was created in Europe after the end of the Cold War.

Taking into account the significant superiority of NATO over Russia in all the major categories of conventional weapons, it is difficult to imagine the situation wherein NATO countries would require American nuclear weapons in order to defend Europe. The new political and military situation on the continent no longer allows the use, or acceptance of an argument that the existence of such weapons, and also their delivery to targets via armaments belonging to non-nuclear-armed countries members of NATO, is dictated by the higher interests of European security and is an alternative to their independent nuclear status.

A number of ideas for establishing control over TNW have been proposed at the non-governmental level. In particular, the Hans Blix WMD Commission made two recommendations in the area of control over this type of nuclear weapon. The first of them proposes that all states would accept obligations regarding non-deployment of any type of nuclear weapons, including tactical ones, outside their national territory. The second recommendation calls for strengthening PNI. In the opinion of the Commission, the Russian Federation and the USA must not only fulfil promises that they made, but must fully destroy nuclear mines, artillery shells, and warheads for short-distance ballistic missiles. Additionally, they need to come to an agreement on removal of all non-strategic weapons to centralised storage facilities located within their national boundaries. There the weapons would be kept until their complete

destruction. These commitments need strengthening through arrangements that would provide verification, transparency and irreversibility^{xii}.

Despite the fact that Russia has a definite interest in developing an international legal regime for limiting tactical nuclear weapons, particularly in Europe, there are significant objective difficulties in its path. Russia's tactical weapons are located on its national territory and therefore cannot reach targets on the US territory. It is precisely because of this that Moscow insists that the United States follows Russia's example and remove its nuclear warheads from Europe. Additionally, Russian TNWs, as admitted by the Russian military, are engaged in other scenarios for nuclear deterrence of third countries.

Another problem concerns the fact that control over tactical nuclear weapons effectively means control over nuclear warheads. Almost all non-strategic delivery vehicles are dual-purpose and assigned conventional missions with conventional munitions as well. Provision of ceilings for such aircraft, missiles, artillery etc. would be irrelevant for TNW for such ceilings would be relatively high (i.e. in the CFE Treaty). Agreeing on verifiable distinctions on TNW dual-purpose delivery systems to separate them from purely conventional ones would hardly be feasible for technical reasons. The approach implemented within the framework of Soviet–American and Russian–American control over strategic nuclear weapons was the limitation on an agreed list of easy to control specific delivery vehicles and on counting rules, assigning to each type of them some maximum number of nuclear warheads—and thus limiting warheads as well. Such method would be unacceptable for TNW. The history of nuclear control has no experience in control and elimination of nuclear warheads—they were usually taken to storage sites for disposal by each side at its discretion after dismantling missiles, submarines and bombers.

Nonetheless, although the above-mentioned complications may be difficult to overcome, it is possible that they are capable of being resolved. Thus, Russian specialist on disarmament Dr. A. Arbatov suggests a number of steps that are partly reflected in the recommendations of the Blix Commission. In the first stage, Russia and NATO could accept mutual obligations not to deploy TNW in Central and Eastern Europe. This zone would include the territory of the NATO member countries that came into this organisation after the end of the Cold War, as well as Belarus and other post-Soviet States located in Europe, and Russia's Kaliningrad region. Full absence of TNW is much easier to control than its quantitative limitations (controlling numbers would imply actually going and counting inside depots). Storage facilities for these types of weapons at Air Force and Naval bases are highly protected and tightly guarded structures, and their external features and location are well-known to parties. Additionally, it may be possible to agree on renouncing the joint storage of TNW and strategic weapons, and thus ensure (without compromising depots for strategic warheads) the possibility of local inspections of TNW depots with short warning times^{xiii}.

The next step, if political relations are favourable and there is some progress in the area of reduction and limitation of general purpose conventional forces in Europe, could be an agreement about a complete relocation of Russian and American TNWs to their national territories and their placement exclusively at centralised storage facilities beyond the deployment areas of troops and arms. In essence, this would

signify a substantial reduction in the level of combat readiness (deep de-alerting), and strengthen safeguards for (although not necessary the liquidation of) TNWs. Such a reduction could be controlled in the same manner as the above-mentioned bans on deployment in Central and Eastern Europe^{xiv}.

Insofar as the physical reduction of TNW through dismantling and utilization of fissile materials, as opposed to the control of strategic nuclear arms, this would imply actually removing explosive devices from bombs, mines, missiles, torpedoes, and shells. Such measures would be meaningless and could not be controlled without a treaty banning production of fissile materials for military purposes (FMCT) and the introduction of control over the already existing stockpiles of weapons-grade nuclear materials and nuclear munitions in storage facilities (so that nuclear warheads simultaneously are not assembled elsewhere). In this sense, destruction of TNW physically would be no different from destruction of strategic warheads in the course of further reduction treaties. So far, during the forty years of negotiations, this has not been stipulated by any agreements on strategic nuclear arms control.

It is obvious that this problem is much wider than the reduction of TNW themselves, and is in the area of a future much more radical and comprehensive phase of nuclear disarmament.

But even to reach initial agreements on TNW similar to those presented above—agreements that would be achievable in practice and useful for mutual security—considerable political will and interest from the parties would be required.

Endnotes:

ⁱ See more: A. Arbatov, V. Vladimirov. Banning of intermediate and short range nuclear range forces. Chapter in: *Disarmament and Security 1997-1998. Russian and international system of control of weapons: Development and Disintegration*. Moscow, Nauka, 1997, pp. 105-110.

ⁱⁱ Conference on the review of the implementation of non-proliferation treaty. Speech by I. S. Ivanov. 25th of April 2000. *Diplomatic Courier Journal*, May 2000. Electronic version is available on a website http://www.mid.ru/dip_vest.nsf/99b2ddc4f717c733c32567370042ee43/25de7700e9ba953ec32568ef0027c951?OpenDocument

ⁱⁱⁱ Shannon N. Kile, Vitaly Fedchenko and Hans M. Kristensen. *World Nuclear Forces*, 2008. – Appendix 8A in: *World Armaments, Disarmament and International Security. SIPRI Yearbook 2008*, Oxford University Press, 2008, pp. 366-398.

^{iv} From English: Presidential Nuclear Initiatives (PNI).

^v *Rossiskaya Gazeta*, 30 Jan. 1992, see also O. Amirov. *Reduction of non-strategic nuclear weapons*. Chapter in: *Russia in its search for security strategy. Problems of security, arms limitation and peacemaking*. Moscow, Nauka, 1996, pp. 56-64.

^{vi} O. Amirov *Reduction of non-strategic nuclear weapons*, p. 61 (see endnote v).

^{vii} A. Arbatov. *Reduction of non-strategic nuclear arms and tactical nuclear weapons*. Chapter in: *Nuclear arms and security of Russia*, Moscow, IMEMO, Russian Academy of Sciences, 1997, pp. 51-57.

^{viii} *ibid.*, pp. 54, 56

^{ix} *ibid.*, p. 54

^x Conference on Review of Implementation of Nuclear Weapon Non-proliferation Treaty. Speech of I. S. Ivanov. 25 April 2000. *Diplomatic Courier Journal*, May 2000. Electronic version available on site http://www.mid.ru/dip_vest.nsf/99b2ddc4f717c733c32567370042ee43/25de7700e9ba953ec32568ef0027c951?OpenDocument

^{xi} Speech by the Russian Federation Delegation during a session of Preparatory Committee, 28 April 2003. *Diplomatic Courier Journal*, June 2003. Electronic version available on site: http://www.mid.ru/dip_vest.nsf/99b2ddc4f717c733c32567370042ee43/1716f45b69467ca8c3256d6b004b6b8d?OpenDocument

^{xii} *Terror weapons: freeing the world from nuclear, biological and chemical weapons*. Russian Edition. Moscow, 2007, p.107

^{xiii} Arbatov A., Dvorkin V. *Beyond Nuclear Deterrence: Transforming the US-Russian Equation / Carnegie Endowment for International Peace/* - Washington DC, 2006. – pp. 141-162.

^{xiv} *Ibid.*