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Verification

of nuclear arms control and nuclear disarmament: experience, prospects, and new ideas

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Verification is a key and indispensable element of nuclear arms control and nuclear disarmament. Any substantive discussion on the future of strategic stability, nuclear arms race limitation, and the prospects for nuclear disarmament becomes pointless if it fails to address verification. To answer the question of what verification should look like in the future, leading Russian and foreign experts analyze the experience of the implementation of bilateral agreements between the Soviet Union/Russia and the United Sates and look at various international mechanisms. For the first time, Russian experts offer a comprehensive assessment of the approaches proposed by the International Partnership for Nuclear Disarmament Verification (IPNDV) and other new initiatives in this field.

This report reflects the personal views of its authors only.

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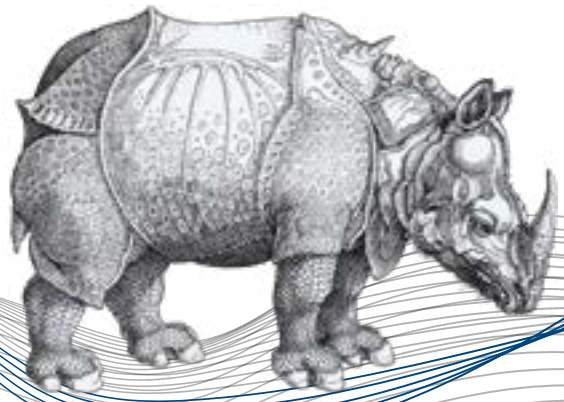

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We need to consider a whole host of factors, such as the emergence of new types of weapons (for example, hypersonic systems) and new theaters of confrontation, such as the outer space and cyberspace. Another important factor is the rethinking of approaches to arms control and verification in the United States, where verification is now defined as political assessment of the results of global monitoring, primarily in the area of nonproliferation.

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Over the past decade, we have seen a much greater international cooperative effort to develop new systems, concepts, and technologies for nuclear disarmament verification. Why do we need such cooperation, given that the nuclear disarmament process has stalled and the prospects for its resumption seem bleak? The development of new objectives, regimes, models, principles and methods of nuclear disarmament verification can stimulate future disarmament talks, bring them closer, and make new regional and global disarmament agreements more likely.

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Legally binding measures make it possible to develop an appropriate verification apparatus and coordinate the scope and modalities of future cooperation. That aspect is especially important in the current circumstances, given the growing aspiration of the non-nuclear-weapon states to monitor and verify the nuclear disarmament process.

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Highlights

Verification is a key element of arms control and disarmament. Article VI of the NPT contains a commitment to end the nuclear arms race and pursue nuclear disarmament, as well as to negotiate a treaty on a general and complete disarmament under strict and effective international control – in other words, a disarmament that includes reliable verification instruments.

The SALT I Treaty formalizes the principle of verification that relies on "national technical means of verification" (NTM). The elimination of an entire class of delivery systems under the INF Treaty and real reductions of other delivery systems and warheads under the START I Treaty required the development of a more complex and reliable verification system. The INF was the first nuclear disarmament mechanism to include inspection activities. The START I verification system included NTM, 12 different types of inspections, continuous observation of mobile ICBM production process, information sharing (including a system of notifications and telemetry exchange), as well as demonstrations and cooperative measures. When the parties developed the New START Treaty, they used the START I verification mechanism as a template, but made it less costly and easier to implement.

We already have a wealth of experience of multilateral verification of nuclear nonproliferation, including of course the IAEA safeguards system. As part of the CTBT, which has yet to enter into force, the international community has built a verification mechanism that is completely unique and unprecedented in terms of its scope. There are also examples of WMD elimination programs that included international verification. Nevertheless, at this time, there is no ready-to-use mechanism of disarmament verification that could verify the disposal of all nuclear weapons components.

Since 2007, there have been several international projects that aim to develop cooperative mechanisms of nuclear disarmament verification involving nuclear weapon states (NWS) and non-nuclear weapon states (NNWS). These initiatives include the International Partnership for Nuclear Disarmament Verification (IPNDV) and the QUAD project. According to their participants, these projects help to fill the pause in the absence of any real disarmament talks, preserve international cooperation skills and discipline, build confidence, strengthen responsibility, and stimulate the launch of fresh talks on nuclear disarmament. One of the main challenges facing such mechanisms is to achieve effective verification without requiring access to sensitive information.

While most Russian experts are ready for dialogue and recognize the scale and usefulness of such endeavors, they also warn against overblown expectations in terms of these projects' feasibility. They argue that no verification system can be universally comprehensive and applicable to all types of agreements. Designing verification mechanisms without consideration for various strategic factors will not help to create the conditions required to launch a multilateral nuclear disarmament process.

Russia remains committed to the conventional, legally binding instruments: namely, international agreements and treaties. These instruments make it possible to develop an appropriate verification apparatus and coordinate the scope and modalities of future cooperation. Verification is one of the greatest advantages of legally binding mechanisms, and no amount of external monitoring can replace it.

Soviet and US approaches to arms control verification during the Cold War

Alexander Saveliev

THE ISSUE OF VERIFICATION OF STRATEGIC arms control agreements was of the utmost importance to the Soviet Union. The need to protect confidential information and strict laws governing state secrets made it impossible to discuss the relevant issues in any detail at the Soviet-US talks. The Soviet top brass, including Defense Minister Andrei Grechko and the Navy chief, Sergey Gorshkov, were strongly opposed to any negotiations with the United States, insisting that Washington would not negotiate in good faith. They eventually agreed to such talks only on the condition that their wishes and recommendations would be heeded very closely by the Soviet delegation. There were also plenty of skeptics on the US side, who did not believe that a fair deal with the Soviets was possible, insisting that Moscow was merely fishing for sensitive information on the US strategic forces.

One of the preconditions for talks put forward by the Soviet military was a strict non-disclosure of any secrets that could be divulged, either intentionally or unwittingly, to the "likely adversary" during the talks. The Soviet delegation at the strategic offensive arms reduction talks was therefore under strict orders from the military-political leadership to avoid even naming any specific weapons systems that could become the subject of negotiations. Under the instructions received ahead of the first round of talks, the Soviet delegation was merely to listen to US proposals, without articulating any position of its own. That position was to be formulated only after the first round of official contacts with the US – and that is exactly what happened.

The SALT I Treaty formalizes the principle of verification using "national technical means of verification"

NTM: NO OBSTRUCTION OR CAMOUFLAGE

During negotiations on the SALT I Treaty, the Soviet delegation made it clear to the Americans that the Soviet position on verification was immutable; Moscow was not prepared to contemplate any significant adjustments. As a result, the treaty stipulated that verification would be achieved "using national technical means of verification". Furthermore, the verification process was required to meet "generally recognized principles of international law". To enable the naming of specific Soviet weapons systems by name in the text of the treaty, the Soviet Union came up with new names, which were different from the designations used by the Soviet forces themselves.

The two parties agreed "not to impede" the specified verification means, i.e. spy satellites, and not to use "deliberate camouflage means" that would impede verification. That particular verification provision was not modified in any substantial way at the later SALT II talks, and when the treaty was signed in 1979, it was left practically unchanged. Even though SALT II was never ratified and did not enter into force, the parties committed themselves to its provisions in the years that followed.

It is worth noting that by the time the SALT I agreement was signed, Moscow and Washington had already accumulated 10 years' worth of experience operating low-Earth satellites whose imagery was detailed enough to detect missile launch silos and nuclear submarines at their bases (not submerged). But such satellite imagery could only be obtained in clear, cloudless weather over the facilities being spied upon. Also, the spy satellite technology was not yet good enough to keep all the strategic nuclear weapons facilities under observation at all times; still, it was better than nothing. Besides, the agreement "not to impede" observation by satellites provided a degree of assurance against the use of anti-satellite weapons, which were being developed at the time in both countries.

On the while, the early approach to verification of compliance with arms limitation agreements reflected the high degree of mistrust between the Soviet Union and the United States; both parties suspected each other of trying to use the talks as a ploy to obtain sensitive information about the "strategic adversary's" nuclear forces.

TRUST? VERIFY!

The elimination of an entire class of delivery systems and real reductions of other delivery systems and warheads required the development of a more complex and reliable verification system that included on-site inspections and monitoring systems installed at production facilities

The mid-1980s brought a drastic change of approach to verification, helped primarily by two factors. The first was the political position of the new Soviet leadership, which came to believe in the idea of a complete nuclear disarmament. Mikhail Gorbachev also took to Ronald Reagan's "trust but verify" concept. And second, it had become perfectly clear to both countries that a complete elimination of entire weapons categories (under the 1987 INF Treaty) and real reductions of nuclear warheads deployed on specific delivery systems (ICBM, SLBM, and HB) could not be achieved without an extremely reliable verification system. The "national technical means" weren't up to that monumental task. That is exactly why the INF Treaty incorporated a very complex system of verification, which included, among other things, on-site inspections and a constant monitoring system at industrial facilities.

The 1991 START Treaty included an even more sophisticated system of ascertaining compliance. In addition to other verification measures, the parties agreed to 12 main types of inspections. The list of the verification-related documents and their sections was several pages long. Such stringency was necessary because the START Treaty contained far more demanding commitments than the INF. Under the terms of the latter treaty, the two parties had agreed to eliminate the entire category of intermediate and shorter-range missiles in one fell swoop. The START Treaty, on the other hand, stipulated deep cuts to strategic weapons systems that required not only verification of the destruction of "surplus" nuclear weapons but also monitoring the numbers of the remaining systems. Whereas controls under INF were required to cover only two weapons categories (types), START covered a much larger number of systems, including land-based (fixed-position and mobile), air-based, and sea-based.

The verification system developed as part of the talks and incorporated into the START I treaty was supposed to remain almost unchanged in the START II treaty of 1993 – but that treaty never entered into force.

The adoption of a new system of verification for the nuclear arms control treaties signed between the Soviet Union and the United States was in most cases regarded as a sign of growing confidence between the two parties. Under the previous Soviet and US military-political

leadership, it was difficult even to imagine foreign inspectors regularly visiting extremely sensitive facilities not just at the invitation of the host party, but whenever they had a suspicion that the other party might be in breach of the treaty's provisions. The inspectors were also free to use their own technical instruments and to take the collected data back home for careful analysis, completely unimpeded because they were given diplomatic immunity.

In my view, such a meticulous verification system, which completely rules out even the slightest violation of the agreement, is not an evidence of confidence, and is not based on confidence. The inspections were sufficient to confirm that the treaty was being observed to the letter – but mutual confidence was not part of the equation.

Furthermore, such a comprehensive and detailed verification system gives rise to a certain risk of growing suspiciousness and confrontation between the parties. Under that system, even the slightest deviation from one of the procedures specified in the treaty (for example, the detailed procedure of eliminating a specific weapons system) is categorized unambiguously as a "breach". Over time, the accumulated number of such "breaches" can become so great that the integrity of the treaty itself becomes compromised. Such a situation enables the parties to complain of "repeated" breaches whenever bilateral tensions flare up. That can lead to extremely worrying consequences not just for each individual treaty but for the entire arms control system as a whole.

In such a situation, common sense no longer serves as a factor of de-escalation when political decisions on security matters are being made. For example, the political and military leadership no longer deems it necessary to consider whether the other party would actually derive any tangible military benefit from the alleged "breach". They may allow their emotions to take the upper hand in an effort to "punish" the other party. The consequences of such ill-considered steps would be disastrous; a case in point is the recent collapse of the INF Treaty.

Naturally, any international arms control agreement should necessarily include some kind of verification system. But the parties to such an agreement should be aware that a verification system is a two-edged sword that facilitates greater confidence while at the same time giving rise to suspicion. That weapon should be used with great care. ■

An intricate system of verification is not based on trust. In the event of a deterioration in their bilateral relations, the state parties can use that system to raise complaints of "multiple" violations, thereby undermining the treaty itself

Would preserving a verification mechanism have saved the INF Treaty?

Sergey Oznobischev

ALLEGATIONS OF NONCOMPLIANCE with the terms of arms reduction and limitation treaties are nothing out of the ordinary. The problem is that the nature of the current political situation, with the ongoing confrontation between Russia and the West – especially the United States – makes it difficult to resolve these differences in a timely manner.

POLITICAL WILL IS KEY TO SUCCESS

Attempts at securing a potential unilateral advantage by various means, including ploys designed to weaken the verification mechanisms, have always been part and parcel of negotiations.

In the late Soviet period, differences over verification issues gave rise to sharp disagreements. There were serious clashes about the need for including space-based verification elements in the **Conventional Forces in Europe (CFE) Treaty**. For a period, talks about including a verification component in that treaty made very slow progress, but the situation changed following the arrival in Vienna of Col. Gen. Nikolay F. Chervov, head of the International Treaties Department in the Soviet General Staff, in the autumn of 1990. Gen. Chervov had a frank conversation with some of the Soviet delegation members, and after that, the CFE negotiations began to make much better progress.

The general's input was not simply an intervention by a senior military officer at the final phase of the talks. It was clear to the negotiators that Gen. Chervov was not merely voicing his own personal opinion as an expert; he was announcing the official position of the political leadership in Moscow on the need to include a very comprehensive set of verification measures in the treaty.

That episode 30 years ago was a clear demonstration of one important fact that remains relevant to this day: a clearly articulated and steadfast political will is a key element of effective and successful negotiations. A case in point is how the whole story of conventional arms control in Europe began all those years ago. In the absence of a clear political signal and political will, negotiations on the armed forces and armaments in Central Europe made next to no progress over a 16-year period from 1973 to 1989. But as soon as the political will was clearly articulated, the extremely complex CFE treaty was negotiated in a matter of just 18 months in 1989-1990.

By the time the CFE was signed, the parties had already designed and put in place the classic verification triad consisting of, 1) a system of mutual notifications, including telemetry exchange; 2) an inspection mechanism; and 3) the use of national technical verification means, backed by the formalized principle of not hampering such means, as agreed in specific treaty provisions. That principle enabled the use of space-based verification means; it included the requirement for deliberate exposure of hardware to satellite observation and for opening the protective domes of the missile silos.

Conversely, the absence of adequate verification measures can, over time, undermine the whole construct of an agreement. Nevertheless, the entire history of negotiations suggests that this purely technical aspect is not the decisive factor.

THE ONLY POSSIBLE SOLUTION. ONCE MORE ON THE SIGNIFICANCE OF THE INF TREATY

For many years, there was an increasingly popular opinion in Russia that the INF was a deeply unfair treaty whose signing was even described by some as treasonous. That opinion had many adherents at various levels, including the expert community and the general public, and it had emerged even before the allegations of US noncompliance with INF provisions. It was argued, for example, that Moscow had destroyed a far greater number of missiles than Washington did in order to achieve compliance (1,846 missiles for Russia and a thousand less for the United States). In fact, Russia had a far larger arsenal of intermediate and shorter-range missiles than the United States did, so a complete elimination of that class of missiles necessitated greater cuts by Russia than by the United States.

Let us also not forget that in the early 1980s, the US intermediate-range missiles deployed in Europe represented a strategic threat to the Soviet Union, especially in view of their short flight time to target. These missiles greatly increased the US nuclear capability, whereas the Soviet Union lacked the technical means at the time to pose a similar threat to the US homeland outside the strategic nuclear forces balance.

Moscow said at the time that in response to the US deployment of its Pershing II sub-strategic nuclear missiles in Europe, the Soviet nuclear missile submarines would sail closer to the US coastline – but Washington wasn't particularly impressed by that threat. The military realized very well that when the Soviet submarines are in close proximity to the United States, they are kept in check by the US anti-submarine defenses, and there aren't enough of those submarines for some of them to escape US surveillance through sheer numbers. That is why the Soviet countermeasure did not really pose the same level of threat to the United States as the US missiles in Europe did to the Soviet Union itself.

Back at the time, politicians and generals proved wise and decisive enough to stop any further escalation of the extremely dangerous nuclear confrontation in Europe, where hundreds of nuclear missiles were deployed in the early 1980s. Soviet Deputy Defense Minister Yuri P. Maksimov, who also served as commander of the Soviet nuclear forces and was highly respected among professionals, argued that the only way out of the situation (which was far more dangerous than the current tensions) was to sit down and talk. "The only thing we can do is negotiate without trying to win a unilateral advantage," he said in an interview.[1]

By agreeing to a complete elimination of an entire class of weapons systems, our country achieved a radical strengthening of its national security. In the Soviet-US context, that agreement completely removed a unilateral nuclear threat facing our country. This was all the more important since the Pershing II missiles were designed to take out heavily protected underground targets. That is why accusations of "treason" hurled at the authors of the INF Treaty cannot be justified by any deficiencies in that treaty's verification provisions.

Another popular criticism of the INF Treaty that has no bearing on that treaty's verification mechanisms is that Russia's military security was compromised because several countries other than the United States still possessed intermediate-range missiles in their arsenals.

It is true that China, India, Pakistan, Israel, and Iran have intermediate and shorter-range arsenals of various sizes. But we are not in a state of confrontation with any of those countries; in fact, some of them are our close friends and "strategic partners". And besides, it would be completely unrealistic to try to achieve an absolute parity in every single weapons category with all our neighbors.

THERE WERE MECHANISMS, BUT NO DECISIONS

Had the INF Treaty verification system continued to operate, would it have been enough to avoid a crisis and save the Treaty? I believe the chances for resolving our differences would have been better – but in the current political circumstances, it would not have been enough to avert a major crisis.

Let us also recall that in legal terms, all verification procedures mandated by the INF Treaty ended 13 years after its entry into force – that is, in 2001. But strictly speaking, even afterwards there were no insurmountable obstacles for enacting the INF mechanism of the Special Verification Commission, set up "to resolve compliance issues" and "consider additional procedures to improve the viability and effectiveness of the Treaty".[2] The main difficulty here was that implementing any additional verification measures after the end of the period agreed in the Treaty was a strictly voluntary undertaking that required a special political decision.

Amid the severe deterioration of Russian-US relations, INF Treaty verification could not be revitalized precisely for political reasons. Even had the verification system been re-enacted as an organizational and technical procedure, it would not have resolved the mutual accusations and recriminations that stem from the existing political circumstances.

A perfect illustration of this point is the implementation of the New START Treaty. Under the terms of the Treaty, the parties have conducted "up to 18 mutual on-site inspections of the ground, naval, and air bases used by their nuclear forces" every year, and "given each other up to 42 notifications on the state of their strategic nuclear forces".[3]

But none of it has stopped Russia from making the accusation that the US claim of having achieved the numerical ceilings mandated by the New START Treaty "is based not only on real arms reductions but also on a conversion of Trident II SLBM launchers and B-52H heavy bombers that was completed in such a way that Russia is unable to

CONTEXT: INF TREATY VERIFICATION

The verification mechanisms agreed to monitor compliance with the INF Treaty set a precedent of legally binding provisions for inspection activities. Russia and the United States agreed to allow inspections in their own territory and in the third countries where their nuclear weapons were deployed for a period of 13 years after the treaty's entry into force. They also agreed to allow ongoing inspections at missile production facilities – namely, at the Soviet Union's Votkinsky Machinery Plant and at the US Hercules Plant No 1 in Magna, Utah. Over the period when the INF Treaty remained in force, the Soviet Union/Russia had conducted 442 inspections, and the United States 774. The total number of specialists involved in inspection activities under the INF Treaty was approximately 7,000 for the Soviet Union/Russia, and 13,000 for the United States.

After the end on May 31, 2001 of the inspection activities agreed under the INF Treaty, verification of compliance relied solely on the national technical means. The implementation of the treaty required the establishment of completely unique organizational structures. The Soviet Union and the United States set up the national Centers for Nuclear Threat Reduction, tasked with sharing information under the INF Treaty and, subsequently, under other treaties. For details, see: A.I. Antonov. Arms Control; History, Current State, Prospects. Moscow: ROSSPEN, PIR Center, 2012. P. 26-30. (in Russian) Arms Control and Military Activity Control. References. Moscow: PIR Center, 2001. P. 45-60 (In Russian)

verify that these strategic offensive weapons have been rendered unsuitable for use with SLBM or heavy bomber nuclear munitions, as stipulated in Paragraph 3, Section 1, Chapter III of the Protocol to the Treaty, and also on an arbitrary re-classification of missile silos built for training purposes as 'training silos', a category that does not exist in the Treaty".[4]

Careful analysis suggests that the parties began to raise various INF compliance issues a long time ago – and even though these claims of noncompliance were not completely unsubstantiated, they were escalated out of all proportion with the actual state of INF verification, and grew in line with the deterioration of US-Russian relations.

Does that mean that the seemingly ideal situation with the New START compliance verification has proved problematic upon closer inspection? Or is it yet another example of political factors at work, with each party trying to discern violations by the opposite side in order to use them as bargaining chips and potentially secure some advantage in the military-political dialogue?

This is in fact one of the reasons why doubts are being voiced as to whether there is any point at all to signing any agreements with the United States.

How serious were the mutual claims of noncompliance with the INF provisions voiced by Moscow and Washington? There is no need to recount all those claims; all the arguments and counterarguments are well known. But instead of trading accusations, the two parties should have long entered into a substantive dialogue and worked out additional verification means to allay their mutual suspicions. The obstacles on that path have always been strictly political rather than technical or negotiations-related.

With sufficient political will on both sides, all the problems with INF compliance could have been resolved fairly quickly, in the framework of the Special Verification Commission that could have been set up in accordance with Article XIII of the Treaty. Perhaps the mutual claims could have been discussed ahead of the Commission's sitting by a joint Russian-US group of experts.

All that was needed for such work to commence was a timely political signal – but that signal never arrived.

Those who had a chance to observe the negotiating process at close proximity would agree that much more serious differences were successfully resolved in an expeditious manner during other arms control talks. In early 2018, the current Russian ambassador to the United States, Anatoly Antonov, who is one of the fathers of the New START Treaty, argued that Moscow and Washington were entirely capable of resolving their mutual claims over the INF Treaty implementation – if only they "stopped discussing those problems via the mass media".[5]

But recent experience amply demonstrates that Russian-US dialogue in general, including dialogue on this particular issue, has a systemic flaw that prevents it from yielding any results. It is a virtual kind of dialogue that manifests primarily as unilateral statements and declarations aptly described by Russian Foreign Minister Sergey Lavrov as "megaphone diplomacy".

Another problem is that attempts at dialogue are foiled by the parties misinterpreting the signals received from each other. For example, following the meeting of the North Atlantic Council foreign ministers in December 2018, Russia was urged immediately to return to full and verifiable compliance with the INF Treaty.[6] For his part, US Secretary of State Mike Pompeo said at a press conference after the summit in Brussels that unless Russia returned to full compliance with the INF within the following 60 days, the United States would suspend the fulfillment of its own commitments under the treaty.[7]

In the West, these statements were seen as a chance to try to resolve the differences – but Russian officials and the vast majority of Russian politicians and experts saw that call by NATO as an ultimatum.[8] Russia responded in a statement by Defense Minister Sergey Shoygu, who urged his US counterpart to "discuss the existing differences regarding compliance with the INF Treaty" – but Washington did not take that call in the spirit in which it was intended.[9]

The episode demonstrates that saving the INF Treaty required a strictly political decision on both sides rather than any efforts to obtain accurate evidence of compliance or noncompliance on both sides. Only a political decision could have initiated a normalization of the situation with the INF Treaty, followed perhaps by additional verification measures as part of that normalization. ■

The future of nuclear arms control and verification challenges

Evgeny Buzhinskiy

THE 1991 START I TREATY included a verification system that was unprecedented in terms of its depth and scope. It included the use of national technical means of verification, 12 different types of inspections, continuous monitoring of the mobile ICBM production process, information sharing (including a system of notifications and telemetry exchange), demonstrations, and cooperative measures.[10] When the parties drafted the New START Treaty, they agreed to use the START I verification system as a template, but made it less costly and easier to implement. The number of various types of inspections was reduced to only two. The Type 1 inspections, which are the most intrusive, are reserved for the facilities that may be used for deployed strategic offensive weapons systems. The simpler Type 2 inspections are conducted at the facilities that are used only for non-deployed strategic offensive systems. Washington had originally proposed additional types of inspections and wanted to retain the monitoring of ICBM production – but Russia found the latter unacceptable. There were plenty of problems during the talks, but in the end, the parties managed to reach a compromise.[11]

NEW TYPES OF WEAPONS SYSTEMS

Any discussion of future arms control verification mechanisms must take into consideration several factors, including the emergence of new types of weapons systems. There include hypersonic and other systems that must be covered by any future arrangements. We must also recognize the potential new theaters of confrontation: namely, the outer space and cyberspace. The two parties signing an updated version of the New START Treaty is a very unlikely prospect, if only because Moscow insists on including the issues of missile defense and the deployment of weapons in space, whereas Washington wants the scope of the treaty to encompass non-strategic nuclear weapons. In other words, any new treaty would have to be entirely different from the New START Treaty.

TOWARDS GLOBAL MONITORING AND UNILATERAL VERIFICATION: THE EMERGENCE OF NEW APPROACHES IN THE UNITED STATES

The United States is currently rethinking its approaches to arms control and verification. That process began under the Obama administration, and was taken further (mostly in the negative direction) under the current administration.

The very idea of verification is now defined in the United States as political assessment of the results of monitoring other countries' compliance with the existing agreements – which is generally the right approach. In the future, because of the absence of legally binding instruments of arms control (including nuclear arms), the emphasis will be on monitoring the nonproliferation process. The Americans

New US approaches: global monitoring necessitated by the growing vertical and horizontal proliferation; improvements to monitoring instruments; multilateral commitments; unilateral measures against offenders

are reaching the conclusion that strict (nuclear and conventional) arms control is becoming a thing of the past, and the future focus should be on verification and monitoring of the nuclear arms nonproliferation process. The proponents of these approaches argue that the United States is now facing both vertical proliferation (greater nuclear weapons capabilities acquired by the existing NWS) and horizontal nonproliferation (a greater number of states that possess a nuclear arsenal).

Monitoring these process becomes a greater technical challenge because of the increasing numbers of delivery systems, the emergence of new types of aircraft and missile systems of various ranges, the arrival of new submarines and surface ships capable of delivering nuclear weapons, and the acquisition of new fissile material production and storage sites by various state parties. In the future, the key challenge will be to monitor nuclear ammunition and components production/storage sites with limited physical access to such sites. The Americans also believe that the task will be further complicated by the steady rise of cyberattacks against monitoring systems.

Monitoring has to be comprehensive because the development and manufacture of nuclear weapons and delivery systems is also comprehensive. For the same reason, commitments under international treaties must be global and multilateral; they should not be limited to only two nuclear weapon states, even if those states happen to possess the world's largest nuclear arsenals. This means that the current US objections to the INF Treaty stem from the new approaches adopted four or five years ago: Washington argues that the treaty was signed by only two state parties, but the number of states that possess intermediate-range missiles in their arsenals is much greater than two.

In this context, the main problem is the constantly growing threat of proliferation. What, then, is to be done about that threat?

The answer proposed by the Americans is to build cooperative regimes and develop unilateral measures (probably sanctions) against the offenders. They want to adopt a global approach to the problem, improve the means and instruments of monitoring, and constantly adapt those means and instruments in response to new threats, primarily cyberthreats.

These proposals began to emerge under the previous administration, but the Trump administration has now begun their actual implementation. With the current absence of legally binding instruments for strict arms control, it is very likely that control will in fact be limited to monitoring compliance with the nuclear arms nonproliferation regime.

These approaches are of course entirely legitimate – but it will be difficult to make do without strict nuclear arms control. The national technical means of verification are no substitute for the existing information sharing regimes, including telemetry exchange, or for on-site inspections.

Sooner or later, the lack of full and accurate information about the Russian and Chinese nuclear forces will force the Americans to return to the idea of negotiating a new strategic offensive arms control agreement, but on a whole new level – otherwise, another nuclear arms race will become inevitable. Besides, that new race will not manifest as a simple increase in the numbers of warheads and their delivery systems; it is more likely to lead to the development of new types of weapons and changes in the quality rather than mere size of the nuclear forces. ■

Can an arms control system rely only on national technical means of verification?

ALEXANDER SAVELIEV:

Such a system was used for verification of compliance with the SALT I Treaty. In the future, however, I do not think the same approach will be used. The lessons we have leant over the decades will compel us to build a more sophisticated control and verification system in some shape or form. But on the other hand, and speaking purely hypothetically: why not? After all, the national technical means of verification are now far more advanced and capable than they were back in the 1960s or 1970s.

SERGEY OZNOBISCHEV:

I do not think that such an arrangement would even qualify as a proper arms control system. In my view, it would only multiply mutual suspicions. Satellites will provide some imagery, but it will not always be clear what exactly that imagery shows. There will be conflicting interpretations, leading to recriminations, and all planning will be based on the worst-case scenario.

EVGENY BUZHINSKIY:

First, if we are talking about a verification system that relies on national technical means, we assume that there is some kind of legally binding agreement in place between the participants. If there are no legally binding commitments, then we are talking about intelligence-gathering rather than verification. In the absence of legally binding commitments, one cannot raise any formal complaints; one can only gather intelligence and draw conclusions on its basis. Second, only the United States and Russia already possess an advanced satellite surveillance system; China is currently building such a system, but all the other states lack such instruments. And third, even advanced modern surveillance systems do not see everything there is to see.

Is verification possible without legally binding agreements, based only on political undertakings such as the JCPoA or the Vienna Document?

ALEXANDER SAVELIEV:

There can be no control and verification system without a formal agreement. In my view, verification mechanisms are designed for specific formal agreements; such mechanisms cannot exist in isolation. On the whole, the more confidence exists between the state parties in political terms, the less verification these parties require.

EVGENY BUZHINSKIY:

There is probably no need to explain the difference between a political commitment and a legally binding commitment. Political commitments survive only so long as the current administration that undertook them remains in office. Many years ago, after the signing of the 2002 Moscow Treaty, I was in consultation with the Americans on the issue of missile defense and strategic offensive weapons. The first thing my US counterpart told me when I mentioned the Clinton administration was, "Forget about Clinton". I said, "But what about continuity?" My counterpart answered, "There is no continuity, the current administration has a totally different agenda". Political commitments are a very fragile thing.

As for the JCPoA, it is not actually a political commitment, it is a multilateral agreement formalized by a UN Security Council resolution. Nevertheless, the current US administration says, "We don't care", and "We don't like it". The Vienna Document, on the other hand, is a good example. There is also another example, the 1997 Agreement on Mutual Reductions of Armed Forces Along the Border between China on the one hand, and Russia, Kazakhstan, Kyrgyzstan, and Tajikistan (who constitute a joint party) on the other. Why do these instruments work? Because they are multilateral documents; the same feat can hardly be pulled off on a bilateral basis. ■

International cooperation on nuclear disarmament verification – do we need it and what can it do?

Lars van Dassen[12]

OVER THE PAST DECADE, there has been a growing international cooperation on developing systems, concepts and technologies for the verification of nuclear weapons disarmament. A first reaction here might be to ask why this is necessary when no nuclear disarmament process is ongoing – or even in sight, and when the trend is rather a move away from arms control after the USA and Russia have announced the cancellation of the INF Treaty and serious question marks are being put on the relevance of upholding the New START Treaty. Furthermore, in the current international climate, most of the possessors of nuclear weapons seem to become more and more emboldened and convinced of the political, strategic and military values of their arsenals as well as of the status and "responsibility" this lends them.

Nevertheless, or some would argue - in order to counter this situation - the scope and number of initiatives to develop measures in the realm of nuclear disarmament verification are if not mushrooming then developing steadily in terms of the states participating in them and the concepts and knowledge developed. In the following, it will be presented how a few of these initiatives have arisen and developed. It will be presented how and why this may serve a wider purpose for nuclear disarmament.

VERIFICATION COOPERATION INITIATIVES TODAY

Verification regimes seem to be part and parcel with successful arms control treaties. Some international agreements such as the 1972 Biological Weapons Convention (that banned biological weapons) as well as the Threshold Test Ban Treaty (forbade the US and USSR to conduct nuclear test explosions larger than 150 kilotons) from 1974 and the Moscow Treaty or the Strategic Offensive Reduction Treaty (SORT) from 2002 are examples of treaties without verification mechanisms and accordingly with a limited credibility lent to the achievements and pledges made under the agreements. In contrast, the Comprehensive Test Ban Treaty, CTBT, from 1996 constitutes an example of an agreement where the verification mechanisms were worked on (if not worked out) long before the Treaty as such was ripe for negotiation and conclusion. It is widely considered to be the case that the CTBT was and could be concluded due to the fact that the verification principles and mechanisms had been established in advance.

The CTBT serves as a source of inspiration for the states and organizations that are currently engaged in the international cooperation on nuclear disarmament verification. Even if the CTBT is not a disarmament treaty as such, it remains a great example of how it can be relevant to work on verification as a preparation for a later treaty arrangement.

Various states such as the USA and the UK have since the 1960es worked on disarmament verification issues and in later years,

from 2007 and onwards, the UK and Norway under the **UK-Norway Initiative** cooperated on finding ways in which holders and non-holders of nuclear weapons would be able to cooperate of verifying disarmament. In 2012, the US-based NGO, Nuclear Threat Initiative, NTI, established a large scale project, the **Verification Pilot Project** that studied whether and how global nuclear disarmament could be achieved. This work was conceptual and was carried out in working groups by scholars and officials from a long range of countries before the results and recommendations were presented at the 2014 NPT PrepCom and at the 2015 NPT Review Conference. The study and its conclusions are very encompassing and deserve a separate survey. However, they argue that global nuclear disarmament is possible, yet it will demand a deeply penetrating cooperation among the holders of nuclear weapons as well as participation with other states on the verification of past and ongoing activities related to existing stocks of weapons as well as the overall production of relevant fissile materials.

Well into the second year of the NTI project, in January 2013, the US State Department announced that it would want to model a cooperation among states on the workings and objectives of the NTI project. This started in March 2015 when **the International Partnership for Nuclear Disarmament Verification** was established at the initiative of the US State Department. The IPNDV which today has more than 30 adhering states as members and participants has in its first four and a half years developed the stages of the disarmament process of a given weapon under dismantlement as well as investigated the verification and inspection challenges in various stages of a disarmament process from early limitations of warheads to later stages where stockpiles are removed entirely. Furthermore, the issues of technology, equipment and the interaction of inspections and declarations are considered. For its next phase from 2020 and onwards, the partners in the IPNDV foresee a more direct testing of the work developed and thus a larger focus will be placed on exercises in the years to come.

Also in 2015, the UK, USA, Norway and Sweden established the **QUAD nuclear disarmament verification**. The purpose was to move head-on with a disarmament verification exercise. Through a large and encompassing planning process, the partners developed an exercise that tested the early stages of a disarmament process and the various principles, methods and technologies that can apply. In October 2017, the exercise LETTERPRESS was carried at the former UK air force base Honnington in East Anglia. The ensuing period has been used to evaluate the exercise as the stepping-stone for the second exercise foreseen for 2023 or 2024.

WHY IS NUCLEAR DISARMAMENT NECESSARY AND DESIRABLE?

The quest for nuclear disarmament and nuclear disarmament verification are closely related. It is hard to think of disarmament verification without it at some stage having a link to parallel or subsequent disarmament arrangements and agreements. And similarly nuclear disarmament will need verification measures to be credible. Yet, it will have to start with the root-causes for disarmament – why is it relevant to strive for disarmament in the first place. Basically there are four sets of arguments: (a) legal arguments as based in international law; (b) political arguments based on security-safety implications from

nuclear weapons possession; (c) political-economic arguments as well as (d) a mixture of the above-mentioned that concerns issues of justice in international politics and that in turn hook on to the three first set of issues. Below is an outline of these arguments without any attempt of being exhaustive.

A first reason for the urge to pursue nuclear disarmament is based in international law where the Art. VI of the Non-Proliferation Treaty, NPT, demands of the Parties to the NPT that "Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control". This is a remarkably short and crisp text for such a complicated undertaking. While this avoids diluting the objectives, the absence of time-frames and mile-stones make it obvious that nothing specific can be said of when and where the goal must be achieved. It is often overlooked that also the IAEA Statute in Art III.B.1 refers to "furthering the establishment of safeguarded worldwide disarmament". For the IAEA to perform this it is a prerequisite that its member states carry the torch as they are the owners of the world's nuclear weapons. Even here the provision is without a time-frame and concerns disarmament in general – not specifically nuclear disarmament. Yet, the proper counter-argument is here that nuclear disarmament is included in "worldwide disarmament". In short, there is a very strong commitment made by the international community and its states that adhere to the NPT and the IAEA to pursue nuclear disarmament. In addition to the mentioned arguments that are based in international law there are also numerous political decisions and declarations from the UN and many other multilateral and regional fora to the objective of nuclear disarmament that underpin the requirements in international law.

However, one of the most important overarching and yet still penetrating arguments for nuclear disarmament stems from the embedded threat and risks that nuclear weapons constitute. Several studies of nuclear weapons management during the past 75 years make it clear that it is maybe only good fortunes that have kept the world from severe mishaps, miscalculations and unintended actions that could have released nuclear weapons explosions and maybe even set-off the various counter-strikes.[13] In a world where hacker attacks are known to have penetrated far into sensitive military systems and made it possible to steal the design of nuclear warheads[14], and where intra-state conflicts like in Syria and Iraq in a complicated pattern with external state actors possessing nuclear weapons also include warring and varying terrorist groups - the presence of nuclear weapons adds to the sums of threats and uncertainties.

The third group of arguments concerns the costs for the nuclear arms race and nuclear weapons possession with all the research and development, maintenance and upkeep costs. When considering these costs it is of course also important to consider the alternative costs, meaning what could have been achieved had the funding for nuclear weapons been used for other purposes. Needless to say, the costs for nuclear weapons during the past three quarters of a century have been enormous and beyond a calculation. If larger shares of these sums had been put into solving socio-economic challenges in both national and international contexts the benefits for peace and development could have been considerable and making nuclear weapons less relevant. This argument is of course the "peacenik" argument and it suffers from

The benefits of international cooperation on verification are as follows:

1. Such cooperation helps fill the pause while talks on new arms control and disarmament agreement have ground to a halt and the existing agreements are about to expire.

2. It helps to preserve the international cooperation knowledge, skills, and discipline; those assets that would otherwise gradually fade into obscurity. It can also help the non-nuclear weapon states to assume greater responsibility in the NPT framework.

3. It serves to build confidence

its would-be character and that we really cannot be sure that money spent for other things than nuclear weapon would have had benevolent consequences. It also overlooks that the nuclear weapons infrastructures in their own right have generated economic and technological development. Nevertheless, at the end of the day, it is important to acknowledge that the total costs for nuclear weapons have been and continue to be large and the early post-Cold War era taught us that "peace dividends" can be used for proper purposes – yet it takes benevolent and visionary statesmen and a conducive international climate to hope for such improvement.

Finally, disarmament is a question of justice. Justice has already been implied in the issues above as for instance the basis of the NPT is justice where there is a balance between rights and obligations. The NPT has a couple of important balancing points in this regard. The 97,5% of the NPT members have promised to abstain from pursuing nuclear weapons in return for the 2,5% of states with nuclear weapons getting rid of theirs. This issue goes beyond the legal obligation embedded in Arts. VI, II and III of the NPT. It even goes into the imbalance that exists when certain states and groups of states have the means to eradicate all others (and themselves) while other states do not have similar means available.

The issues above are of course extremely complicated and in daily life they are bent over the various security political concerns and prerogatives. In addition there are various alliance systems that make the issue of "threatening with nuclear weapons" and "threatened by nuclear weapons" a lot more complicated than it just being a question of haves and have-nots.

CAN VERIFICATION INITIATIVES PAVE A ROAD INTO NEW LANDS RELATED TO NUCLEAR DISARMAMENT?

With the abovementioned in mind it is obvious that we have two situations that are radically opposed. On the one hand there is an "ought-to-be" set of ideals, reasons and arguments for disarmament and on the other hand there is a set of die-hard "security political realities" that block the realization of the ideals. The international work on disarmament verification can be said to perform three functions in bridging the realities and the ideals. First of all, international cooperation on disarmament can fill the time gap where and when there is an impasse in the negotiations of new disarmament agreements and when existing agreements expire. Experience from the INF Treaty, the CTBT and the Chemical Weapons Convention show that a break-through that allows for arms control agreements can come suddenly.

Verification work can in this way make sure that a trade and discipline in international cooperation is not dying away unnoticed. Moreover, the international cooperation on disarmament verification can create competence among a broader layer of states, institutions and international organizations that have a vested interest in the issue. Broader knowledge can lead to different groups of non-nuclear weapon states taking larger responsibility in relation to the NPT. The new knowledge on verification that participating states acquire has the benefit of equipping more states with arguments for the NPT Review Conferences and related processes. A larger range of states that can speak with quality on one particular issue that is of utmost importance for any progress in the NPT context. Thirdly and most importantly, international cooperation on verification can sui generis create confidence among those participating in the work. This is in itself beneficial for any discussion on disarmament.

Nevertheless, it is hardly going to be progress on disarmament verification that brings about nuclear disarmament. Yet, having said that, it is highly possible that it is the establishment of various, goals, modes, models, principles and methods for verifying nuclear disarmament that can facilitate or be precursors for subsequent disarmament negotiations and agreements.

THE LIMITS - AND IMPORTANCE - OF EXISTING EXPERIENCES FROM "REAL DISARMAMENT VERIFICATION"

It is relevant to ask – how about the "real disarmament verification experience out there", for instance in the shape of the methods, technologies, procedures and experiences from human and institutional interaction that the START I Treaty, New START and the INF have generated since the 1980s. Here it is important to underline that these experiences are of incredible relevance and importance. They point to what can be achieved in terms of introspection, reciprocity as well as the dynamics and trust (and mistrust from time to time) that evolve.

However, it is also necessary to say that in spite of the various treaties between the USSR/Russia and the USA on the disarmament of strategic and intermediate-range missiles, these treaties have not been real disarmament treaties. They have restricted the stationing of operational means of deliveries (bomber aircraft, submarines, missiles etc. and the maximum amount of nuclear warheads on them – but they have not dealt with the specific dismantlement and destruction of nuclear warheads. Russia and the USA have with a reference to accomplishments under the START I, New START and INF Treaties disarmed thousands of nuclear weapons under bilateral schemes (and unilateral schemes, it should not be forgotten). But even if the remaining New START Treaty restricts the number of stationed and operational missiles and their warheads as well as the number of bases for these means of delivery, the parties have no obligations to restrict the nuclear warheads they have in store and the nuclear weapons materials in reserve. For a discussion on how to achieve real nuclear disarmament where particularly the warheads are dismantled and the fissile materials verified and stored or disabled under a thorough inspection regime, there are thus many things that have not been done under previous and existing disarmament treaties. This in itself points to why it is both necessary and relevant to continue to penetrate the nuclear disarmament verification issues.

It is as stated not international cooperation that brings about nuclear disarmament. At best it can serve as a precursor or door-opener. This is also to say that the international disarmament verification research and cooperation should not be seen as an automatic threat and challenge to the prerogatives of the holders of nuclear weapons. It is not necessarily the case either that possibly ensuing agreements on disarmament will concern the NWS.

It could be that other contexts such as the case of North Korea become the subject of attention and where a thorough solution is needed in a short time.

All good forces will be needed to make good recipes and understand the ingredients. Then it will depend on other things whether and when the meal will be prepared. ■

Are the existing international experience and mechanisms sufficient for multilateral verification of nuclear disarmament?

Gennady Pshakin

BEFORE WE CAN CREATE A SYSTEM TO VERIFY A COMPLETE NUCLEAR DISARMAMENT, we need to define, fully and comprehensively, the term "nuclear weapons".

The **NPT** contains such terms as "nuclear weapons" and "nuclear explosive devices" but lacks a clear definition of them. "Nuclear weapons" are generally understood to include the actual nuclear warhead, the delivery systems (missiles, bombs, torpedoes, or mortars), and systems for their operation (control, storage, and maintenance).

The entire process of building a nuclear weapon consists of the following phases:

1. Production of weapons-usable nuclear material, i.e. plutonium or highly enriched uranium
2. Weaponization, which consists of designing, manufacturing, assembling, arming, testing, and storing nuclear and non-nuclear components
3. Building delivery and maintenance systems

Clearly, the process of disarmament must address all three of these phases. The dismantlement of each phase will require its own methods and techniques. At this time, the most tried and tested method is verification of Phase 1, which includes placing nuclear materials and their production/processing facilities under safeguards, as stipulated in Article 12 of the IAEA Statute and Article 3 of the NPT.

The application of international safeguards in the NPT framework focuses on nuclear material and facilities for its production rather than on nuclear weapons proper

The NPT and the international safeguards focus on nuclear material and facilities for its production rather than on nuclear weapons as such. In accordance with the definition used in the NPT, the nuclear weapon states are under no obligation to place all their nuclear weapons or production facilities under **IAEA safeguards**. A special set of measures could be developed in the IAEA framework for the nuclear weapon states, similar to the Safeguards agreements (INFCIRC/153) and specifying all the modalities of the elimination of nuclear weapons and of the verification of that process. But developing a template for such an agreement would be extremely laborious and time-consuming, especially taking into account the specific circumstances of each state, and given the sensitivity of all nuclear weapons-related information.

Other international nonproliferation mechanisms, such as the **Zangger Committee**, **the Nuclear Suppliers Group (NSG)** rules, the individual agreements on nuclear weapons free zones, and other arrangements, were designed to support nuclear nonproliferation, but they do not serve the purpose of nuclear disarmament.

Bilateral agreements on nuclear arms reduction do not include comprehensive and multilateral verification of dismantlement for all nuclear weapons elements. **The Russian-US Plutonium Disposition Agreement** mentions verification measures by the IAEA, and a trilateral Russia-USA-IAEA group worked for a time to develop verification mechanisms for that agreement – but the parties eventually

abandoned the idea. Also, the scope of the agreement included only the plutonium extracted from nuclear warheads rather than all nuclear weapons as a class. The entire disarmament process (which includes decommissioning nuclear warheads, dismantling them, and disposing of the nuclear material and non-nuclear components) was essentially outside the scope of the Agreement and the related discussions.

Iraq. The international community already has a precedent of a complete elimination of a national nuclear weapons program under full and comprehensive UN control. The program in question was the secret Iraqi effort to build a nuclear arsenal. Its dismantlement was based on a special UN Security Council mandate and represents a "coercive option" of nuclear disarmament. The investigation and elimination of the Iraqi WMD program, including its nuclear weapons component, has demonstrated the enormous organizational and technical challenges of inspecting and monitoring every nuclear and non-nuclear component of a nuclear weapons program. Clearly, the "coercive option" cannot be used as a mechanism of universal nuclear disarmament.

South Africa has set a precedent of a voluntary decision by a national government to dismantle its nuclear weapons using its own means and resources. The decision by the White minority government to dismantle the South African nuclear arsenal (which consisted of six nuclear bombs) was taken in a difficult domestic political situation, shortly before the collapse of the Apartheid. Rendering nuclear materials unusable, joining the NPT, signing a safeguards agreement, and inviting IAEA inspectors to verify the disposition of nuclear materials constituted a positive experience – but the international community was shown only a part of the South African nuclear weapons program.

Meanwhile, for India, Pakistan, Israel, and North Korea, there are no legally binding instruments in terms of their nuclear disarmament.

None of the nuclear weapon states has joined the Treaty on the Prohibition of Nuclear Weapons, so that document is far removed from reality and unlikely ever to be implemented.

To summarize, we have a few individual elements of a nuclear disarmament verification mechanism – but there is no ready mechanism in place for a comprehensive verification of the elimination of all nuclear weapons components. ■

CONTEXT: TRILATERAL INITIATIVE

"In 1996 – 2002, the United States, Russia, and the IAEA set up the so-called Trilateral Initiative to develop controls over the excess stocks of weapons-usable fissile material. The initiative proposed the method of information barriers to prevent the disclosure of sensitive information. In order to test this method, the sides came close to agreeing control measures for the Russian Mayak nuclear storage facility and the American KAMS storage facility at Savannah River,28 but this work was never completed...

...By November 2001, the United States and Russia were on the verge of agreeing a standard verification agreement, but the two governments ended the talks after the Bush administration said it did not support the 13 steps to disarmament approved by the NPT Review Conference in 2000, which included an expression of support for the Trilateral Initiative. Russia also said it was not prepared to continue the initiative. In 2002, both sides officially declared that the initiative had been a success, and the parties should now proceed to implementing it based in individual agreements." Roland Timerbaev. Fissile Material Cut-off: New Chances for the New Life // Security Index. 2010. Vol.16. No 1 (90). P. 27-29. For more details, see also: Shea Thomas E. The Trilateral Initiative: a Model for the Future? Arms Control Today, May 2008.

Verification of nuclear disarmament without access to sensitive information

Pavel Podvig

Access to sensitive information is not part of the process of multilateral verification of nuclear disarmament

NUCLEAR DISARMAMENT REMAINS ONE OF THE CENTRAL ITEMS ON THE INTERNATIONAL AGENDA. We are facing a growing complexity of the challenges that need to be resolved in order to facilitate further nuclear arms reductions. In addition to political problems, there is a whole host of practical aspects of the nuclear disarmament process. One of them is a clear international realization that the process must include the development of effective verification methods that would make the elimination of nuclear weapons irreversible.

Growing interest in verification has led to the establishment of several international projects in that area. One of the early examples is the UK-Norway Initiative; another is the International Partnership for Nuclear Disarmament Verification, IPNDV, which involves over 25 different countries. In a notable development, the United Nations has also set up a Group of Governmental Experts tasked with exploring the role of verification in promoting nuclear disarmament; the group held its first sitting in 2018.

One of the conclusions reached by the verification-related research projects is that the reliability requirements to verification systems will grow as the disarmament process makes progress. Significant efforts have been undertaken to figure out how these requirements can be reconciled with the need to protect sensitive information about nuclear weapons and fissile material. The focus on the protection of sensitive information is entirely justified because verification of the nuclear disarmament process will involve all countries, not just the nuclear weapon states. This paper outlines some of the approaches to nuclear disarmament that do not require access to nuclear warheads or weapons-usable fissile material.

VERIFICATION OF THE ABSENCE OF NUCLEAR WEAPONS

Most of the nuclear disarmament verification projects presuppose that the nuclear warheads elimination process will include verification measures for every stage of that process, from disarming the delivery system used for the warheads to dismantling the warheads themselves. Such a process must include information sharing about the numbers, types, and locations of the warheads to be eliminated, as well a procedure for verifying the authenticity of the warheads and monitoring their transfer between the successive stages of the elimination process.[15]

The need for sharing such information and for granting access to nuclear warheads is a major obstacle on the way to building an effective verification system. At the time of this writing, not a single nation has ever shared information about the numbers or the location of its nuclear warheads, either unilaterally or as part of the various disarmament agreements. The bilateral Russian-US nuclear arms reduction treaties are almost entirely based on sharing information about delivery systems

rather than the nuclear warheads deployed on those systems. Only the New START treaty includes individual measures that reveal some of the information about the actually deployed strategic warheads. Attempts to reach an agreement on access to nuclear warheads undertaken as part of strategic arms reduction talks have proved unsuccessful. As for the non-strategic warheads, neither Russia nor the United States has ever disclosed any information about their numbers or deployment locations.

Verifying the authenticity of the warheads being eliminated is also an exceptionally difficult problem because such procedures involve a great risk of disclosure of sensitive information about the nuclear warheads design. To address this problem, several international projects have researched new approaches based on using information barriers to shield sensitive information. But these efforts suggest that creating – and, even more importantly, certifying such a mechanism is an extremely complex task that requires a high degree of mutual confidence among all the participants in the process.

The difficulties related to access to sensitive information about the numbers and types of the deployed warheads, as well as about their design and attributes, could potentially be avoided if the disarmament process we to be designed in a way that makes actual contact with nuclear warheads unnecessary for verification purposes. In such a case, the disarmament process would focus on removing warheads from their delivery systems; transporting them to centralized facilities for storage and dismantlement; eliminating the nuclear warheads deployment infrastructure; and eliminating or converting the delivery systems. In fact, this is exactly the approach used in the INF and START treaties and in the process of removal of Soviet and US nuclear weapons from several European countries. There is every reason to believe that the same approach will be used to facilitate future nuclear arm reductions.

It is worth noting that in the past, many of the nuclear arms reduction measures did not include verification. That does not mean, however, that it is impossible to verify the implementation of measures to remove and eliminate nuclear warheads and delivery systems. What is more, developing verification procedures that could reliably ascertain the absence of nuclear weapons in various circumstances would open up possibilities for verifiable nuclear arms reductions that do not require access to sensitive information. Such an approach to nuclear disarmament represents an alternative to a process based on verifying the dismantlement of each individual warhead.[16]

In essence, nuclear disarmament is a process that eliminates the possibility of using nuclear weapons by erecting ever higher barriers on the path to a state in which nuclear warheads are ready for combat use. That process can be broken down into several stages that can be verified by means of ascertaining the absence of nuclear warheads and/or the possibility of using them.

For systems such as ground-based intercontinental ballistic missiles (ICBM) or submarine-launched ballistic missiles (SLBM), the state of combat readiness requires the presence of a warhead in the payload section of the missile. The same combat readiness requirement probably exists for many non-strategic sea-based systems, such as torpedoes and cruise missiles. For these systems, the procedure of verifying the absence of deployed nuclear warheads can use the same approach that was used in the START treaties for confirming the numbers of the warheads deployed on ICBM and SLBM missiles. The

Eliminating the possibility of using nuclear weapons means making certain that nuclear warheads are not immediately ready for combat use. For ICBM and SLBM, this can be verified by using radiation detection instruments to ascertain the non-nuclear nature of the re-entry vehicles installed on a missile. For aircraft and most of the non-strategic systems, the same goal can be achieved by ascertaining that the nuclear warheads storage facilities are empty

An important nuclear disarmament step is the dismantlement of the nuclear weapons deployment infrastructure, as verified by ascertaining the absence of any nuclear ammunition storage systems

START procedure includes choosing a delivery system at random for inspection, as well as using radiation detectors to ascertain the non-nuclear nature of the item found in the payload section of the missile being inspected. This procedure may have to be modified for use on torpedoes or cruise missiles, but its basic principles will remain the same.

For such nuclear weapons classes as strategic and non-strategic bombers and for most of the non-strategic systems, combat readiness does not involve a constant presence of nuclear ammunition on the delivery systems. In most cases, nuclear munitions are kept in storage facilities in close proximity to the locations where their delivery systems are deployed. In such a case, rendering weapons systems non-combat-ready can be achieved by removing the nuclear munitions from the storage facility. Verification of the removal should be fairly straightforward because it would boil down to ascertaining that the storage facility is empty and that no containers that could house a nuclear device are found on the premises. Since the verification procedures will presuppose that there are no nuclear devices to be found on the premises, inspectors will be able to use intrusive verification methods that would be unacceptable otherwise.

The next important step in the disarmament process is eliminating the nuclear weapons deployment infrastructure. These operations can be verified by means of ascertaining the absence at any individual facility of the systems needed for safe and secure storage of nuclear munitions and for their regular maintenance. If such systems are not in place, the facility cannot be used for nuclear weapons deployment on a permanent basis. That being said, we should also remember that short-term deployments of nuclear weapons (such as airborne delivery systems) require no special infrastructure; a simple runway will suffice. Still, the elimination of infrastructure represents an important step towards disarmament.

The verification measures based on ascertaining the absence of nuclear weapons could be used for the elimination of nuclear weapons on the Korean Peninsula and for non-strategic nuclear arms control in Europe

Yet another step in the sequence of measures to eliminate the possibility of nuclear weapons use is the dismantlement or conversion of their delivery systems. Examples of such steps include the elimination of intermediate- and shorter-range missiles agreed in the INF Treaty, or the conversion of heavy bombers under the New START treaty. Even though the conversion is usually reversible, its effectiveness as an instrument of disarmament can be increased by using it in combination with other steps.

The verification measures based on ascertaining the absence of nuclear weapons can be applied in a whole range of situations. For example, they could be used as part of a process of nuclear weapons elimination process on the Korean Peninsula in order to demonstrate that the United States has removed all its nuclear weapons from South Korea. It is also possible to use these verification measures for the elimination of nuclear weapons on entire classes of delivery systems such as cruise missiles or surface ships.

One of the scenarios of using the nuclear disarmament approach based on nuclear weapons removal from their bases deserves a special mention: that scenario can be applied to non-strategic nuclear weapons in Europe. The conventional approach to this problem assumes that Russia and the United States must share information about the numbers of their non-strategic nuclear warheads and grant access to their deployment and storage sites so that the information can be verified. But such an approach is not the only way of achieving genuine nuclear arms cuts; in fact, it is not the best approach for non-

strategic systems. The alternative way of dealing with nuclear arms in Europe would be to remove all non-strategic nuclear warheads from their deployment bases to centralized storage facilities.[17] Once these measures have been implemented, verification arrangements would only need to ascertain the absence of nuclear warheads at the military bases and storage facilities located in direct proximity to the delivery systems.

FISSILE MATERIAL CONTROL AND DEFERRED VERIFICATION

The disarmament process based on the removal of nuclear warheads from their bases and the subsequent verification of the absence of nuclear weapons does not address the question of what happens to the warheads once they have been removed to centralized storage facilities. Verification measures for the dismantlement of nuclear warheads do not provide an answer, either. Even assuming that the fissile material released from the dismantled nuclear warheads is placed under international control, such a procedure is no guarantee that new warheads are not being secretly built to replace the ones that have been dismantled, using the existing stockpiles or newly produced fissile material. Ensuring that the nuclear disarmament process is irreversible therefore requires comprehensive controls and monitoring measures for all aspects of nuclear activities.

One way of achieving this would be to ban the production of weapons-usable fissile material using such international instruments as the Fissile Material Cut-off Treaty (FMCT). But to be an effective instrument of nuclear disarmament, the FMCT must include obligations with regard to the existing stockpiles of fissile material. At minimum, the treaty should contain a mechanism that would enable the state parties to declare the amount of fissile material in their possession. Since none of the nuclear weapon states support the inclusion of the existing stockpiles in the scope of the FMCT, this issue is one of the greatest obstacles to commencing negotiations on signing the treaty.

One of the central arguments against including any declarations on the existing fissile material stockpiles in the scope of the treaty is that the accuracy and completeness of such declarations would be impossible to verify. It is true that a significant amount of the existing material is contained in warheads, including those currently deployed. Also, fissile material can be found in nuclear ammunition components, and some of it may be reserved for military applications. In all such cases, the materials and components retain secret or sensitive attributes, meaning that it is next to impossible to make them subject to verification procedures.

Nevertheless, it is possible to verify the accuracy and completeness of the declarations on fissile material stockpiles without obtaining access to nuclear warheads, their components, or materials that retain sensitive attributes. Such a possibility is provided by the concept of deferred verification, which is based in the idea that the amount of fissile material contained in nuclear warheads and other sensitive categories is known to the state that controls these materials with a very degree of precision. Therefore, such declarations may contain information about the full amount of fissile material and the amount being used for nuclear weapons purposes (making it unavailable for verification).[18]

In terms of the verification procedures, the entire nuclear weapons complex would be divided into two segments: the closed segment containing materials with sensitive attributes and unavailable for

One way to ensure that nuclear disarmament is irreversible is to ban the production of weapons-usable fissile material

The concept of deferred verification makes it possible to verify the accuracy and completeness of declarations on fissile material stockpiles without access to nuclear warheads, their components or materials that retain sensitive attributes

verification, and the open segment that is available for verification. A certain arbitrary amount of fissile material can be added to the closed segment if that is required for protecting sensitive information about weapons-usable materials (such as information about the average amount of material per warhead) – but only on the condition that the amount of material in the entire segment is known to the same high degree of accuracy. Once the material has been declared, any further additions of new material to the closed segment would be prohibited.

The verification procedures in the open segment would aim to establish the balance of material by means of taking an inventory and analyzing the arrival and expenditure of material. It is important to stress that the lack of access to the closed segment would be no obstacle to establishing the overall balance because the amount of material contained in that segment will be known with a high degree of precision.

The only verification procedure that would be required for the material in the closed segment is accounting for the amount of material removed from that segment – for example, for use in the commercial sector of for disposal. Since that material will be converted into a form lacking any sensitive attributes, it will be possible to measure the precise amount very accurately. In the longer term, we can expect that the disarmament process will eventually lead to a completely elimination of nuclear weapons – meaning that all the material initially circulating in the closed segment will eventually end up in the open segment.

Isolating some of the material in a separate closed segment would help avoid many problems related to access to sensitive information about nuclear weapons or weapons-usable fissile material. At the same time, the deferred verification concept would enable us to implement the verification procedures in a gradual manner as the state parties gradually achieve the necessary level of confidence in the verification process.

The examples described in this paper demonstrate that nuclear disarmament verification measures should not necessarily require access to secret or sensitive information.

The disarmament process should be designed in a way that verifies the absence of nuclear weapons, their components, or sensitive weapons-usable fissile material. Implementing such an approach to disarmament would also eliminate the need to share information about the numbers and types of nuclear warheads, or to verify the dismantlement of the decommissioned nuclear warheads. The focus of the verification activities would shift to verification of fissile material, which provides a more reliable guarantee of irreversibility of nuclear disarmament. ■

Anything useful on the "menu"? Approaches to verification of multilateral nuclear disarmament

Andrey Malov

THERE HAVE BEEN SEVERAL ATTEMPTS IN RECENT YEARS to develop the outlines of a verification mechanism for a multilateral nuclear disarmament process. Any universal recipes and algorithms for verification mechanisms that would be applicable to all possible models of nuclear disarmament, without any reference to specific, legally binding agreements, are a very hypothetical proposition. Drawing up a "menu" of ready-to-use verification "recipes" can play a positive role in demonstrating that verification of a multilateral nuclear disarmament process is not an insurmountable task. But designing such verification models is no replacement for developing realistic approaches to multilateral nuclear disarmament. A genuinely usable model should account in practice for all the numerous strategic factors that would make it possible to engage all nuclear weapon state in a nuclear disarmament process.

ABSTRACT RECIPES AND CONCRETE PRINCIPLES OF WORKABLE VERIFICATION

There are serious doubts about the ideas that focus on adjusting the already existing instruments of nonproliferation, arms control, and disarmament verification. We need to avoid the very real risk of destabilizing the existing mechanisms that took such a lot of work to develop on the basis of difficult mutual compromise and fragile mutual confidence.

Verification is not primarily about a formalized process of engendering an acceptable level of mutual confidence; it is more about a clear set of specific technical measures. Agreeing such measures requires laborious negotiations; the delegations are often forced to seek explicit approval and consent from their superiors back home in order to formulate an absolutely specific and unambiguous arrangement.

In practice, verification regimes cannot really exist outside the framework of specific agreements. There are doubts about the ability of abstract verification "recipes" to facilitate progress towards nuclear disarmament – even if their focus is on developing individual modules, which usually deal with the reduction and elimination of nuclear warheads rather than their delivery systems.

Developing potential verification solutions for future use, as an addition to the existing mechanisms or to fill the gaps in the existing verification arrangements, does not guarantee adherence to the universal formula developed by the NPT Review Process: nuclear disarmament must be implemented in a way that strengthens international peace and promotes equal and indivisible security for all.

It is not impossible to develop mechanisms for a multilateral

nuclear disarmament process that would include a series of limitations and reductions leading up to a complete elimination of nuclear weapons, and that would consist of a whole host of unilateral, bilateral, and multilateral measures on a regional and global scale. But in and of themselves, such mechanisms, should they be created, would not put in place all the necessary conditions for a multilateral nuclear disarmament.

Can a verification system be truly universal and applicable to all types of agreements? I think not. In each specific case, the verification system should be specific to the task at hand and agreed by all the parties involved.

Verification system cannot be truly universal and applicable to all types of agreements. In each specific case, the verification system should be specific to the task at hand and agreed by all the parties involved

Our experience of special verification procedures tells us that getting a state to agree to any specific verification procedure is not always equally easy, or equally difficult. This has to do with differences in the organizational structures of strategic nuclear forces, nuclear weapons complexes, and nuclear ammunition storage and maintenance systems.

It is clear that verification is a key element of any effective arms control and disarmament agreement. The verification system for nuclear (or any other) disarmament should meet certain important criteria:

- It must follow universally recognized norms and principles of international law, one of which is the principle of noninterference in the affairs of other states.
- The verification measures must be adequate to the nature and scope of the agreement.
- The verification measures must be reliable and realistic – that is, practical and economically feasible.
- These measures must facilitate effective implementation of specific legally binding instruments rather than serve any short-term political goals.

Speaking of a universal "verification instruments toolbox", such a toolbox usually includes the following instruments:

- National technical means, including external ones (spacecraft and radars)
- On-site inspections, on-call inspections
- On-site instrumental verification
- Telemetry exchange
- Coordinated confidence-building measures
- Notifications
- Various demonstrations, technical and non-technical data sharing, and many other instruments

The choice of specific measures usually depends on the commitments undertaken as part of the specific agreement, as well as the existing practical experience of implementing similar agreements.

A matter that deserves special consideration is the "outreach" format, which means granting access to information about the agreement's implementation to "outsides" – meaning the state parties formally not involved in the agreement. In each specific case, the outreach parameters are usually discussed beforehand by the parties to the agreement. The same formula can well be applied to multilateral disarmament regimes.

Legally speaking, verifying the implementation of an agreement is the prerogative of the state parties to that agreement, unless those parties have specifically decided otherwise.

There is a clear need to address the potential issue of sensitive information that may be disclosed as part of verification procedures.

On the basis of these or very similar conceptual approaches, Moscow has been very critical about the decision to set up a Group of Governmental Experts under the UN Secretary-General to explore the role of verification in promoting nuclear disarmament (the Group was established in accordance with UN General Assembly Resolution 71/67).

Nevertheless, Russian representatives have taken part in the work of the Group. Discussing and sharing our views, even when those views diverge, is always preferable to isolating ourselves from substantive efforts by qualified experts because of some existing preconceptions or propagandist clichés.

The "outreach" format, which implies granting access to information about the implementation of international agreements to states that are not formally parties to those agreements, can be applicable to multilateral disarmament regimes.

MODELS OF MULTILATERAL VERIFICATION: INITIATIVES AND EXPERIENCE

There are diametrically opposed approaches to the very need for verification.

For example, the lessons learnt from the implementation of **the 1967 Outer Space Treaty**, which bans the deployment of WMD in the outer space, suggest that in some situations, we can well do without a specific verification mechanism. The lack of a verification mechanism for this particular treaty is balanced out by the colossal political cost the offender would pay for breaking the treaty.

On the other hand, if a draft treaty lacks a verification mechanism, that lack could be one of the reasons for not even starting substantive negotiations. A case in point is the draft treaty on the prevention of the deployment of weapons in outer space, jointly proposed by Russia and China.

The NPT and its key Article VI clearly place verification in the broader context of universal and complete disarmament under strict international control. Any attempts at breaking the link between verification and a specific disarmament process could eventually prove counterproductive. In that sense, verification is not a "self-sufficient product".

IAEA. The International Atomic Energy Agency is often saddled with the role of a nuclear disarmament verification instrument in its various shapes and forms – for example, for the purposes of multilateral nuclear disarmament or for some specific future agreements, such as the eventual agreement banning the production of weapons-usable fissile materials (the Fissile Material Cut-off Treaty, FMCT).

Such attempts cannot be viewed outside the context of reforming the IAEA safeguards system. Specialists are well aware that previously, technical safeguards procedures were clearly tied to specific facilities, with similar facilities requiring similar safeguards protocols.

The efforts to raise the safeguards to the "state level" suggest that safeguards activities are becoming politicized. In other words, allowing the scope, the methods, and the intrusiveness of safeguards procedures to be dictated by potentially prejudiced assessments of the possible threat any specific state might pose in terms of proliferation

(especially since the assessments are made by the IAEA Secretariat, which a purely technical executive body) undermines the IAEA's credibility and the effectiveness of the safeguards activities.

There are also doubts about the idea of using the IAEA Secretariat as a verification mechanism for the FMCT if and when the treaty is signed. The main reason for these doubts is that the purposes of the inspections as part of the FMCT and of the IAEA safeguards inspections would be very different

Also, attempts at using the FMCT to apply the verification procedures required under comprehensive safeguards agreements to nuclear weapon states are very unlikely to succeed because they directly contravene the provisions of the NPT

FMCT. Speaking of any eventual verification mechanism, let us not forget how deeply divisive the very idea of that treaty has become.

First, there is the question of the general thrust of the treaty: should it be an instrument or nonproliferation, and instrument of disarmament, or both? In accordance with the so-called Shannon Mandate formulated in CD/1299 (a document of the Conference on Disarmament), the scope of the treaty should specifically exclude the already existing stockpiles of weapons-usable fissile material. That is what Russia's official position is based on.

This "nonproliferation" version of the FMCT should not ban the production of any fissile materials of any grade or isotopic composition for either peaceful or military purposes, so long as it is not related to the production of explosive nuclear devices. The only ban we can discuss is a ban on diverting such material to nuclear weapons purposes. Accordingly, the verification system should be designed to support these goals.

Also, the verification formula itself cannot exist in a vacuum, and in the case of the FMCT, we are facing the problem of defining "fissile material".

Experts who work for the Russian nuclear weapons complex argue that the technical prospects for verification are unclear. Verifying the inventories of missile material in the nuclear weapon states (including the unofficial ones) is hardly feasible. It's a fact.

As for the scope of the treaty, Russia believes that it should exclude the fuel of naval propulsion reactors (civilian as well as military). One of the reasons for that is the absence of any practical possibility for verification in this particular area.

The problem of definition is closely interlinked with the scope of the treaty. The differences between the national approaches to this complex issue are very substantial, and this has been made clear in the final documents of two working groups of governmental experts.[19]

The official Russian position prefers an extremely narrow definition that includes only the material that can be used for building nuclear weapons.

All of this demonstrates that verification is an extremely sensitive issue that depends on a whole host of factors and parameters, and the parties tend to have their own very distinctive views on the matter.

CTBT. The Comprehensive Nuclear Test Ban Treaty includes a verification mechanism that is unique and unprecedented in terms of its scale.

The work to establish that mechanism began a long time ago, back in 1997. Very importantly, that work must be completed by the time the treaty enters into force. The task of developing and implementing the CTBT verification mechanism is carried out by the CTBTO Preparatory Commission.

The key elements of the CTBT verification mechanism are the International Monitoring System (IMS) and the International Data Center (IDC), which are linked together by satellite-based Global Communications Infrastructure (GCI), as well as on-site inspections (OSI).

When the IMS is fully deployed, it will be a network of 377 stations (170 seismic, 60 infrasound, 11 sonar, and 80 radionuclide detection stations) in 90 countries all over the globe. In late 2018, the CTBTO PC estimated the system's readiness at 91%.

The IMS and the IDC are already working on a provisional basis. The nuclear emergency at the Fukushima NPP in 2011 served as a stress test for the system. Both the IMS and the IDC acquitted themselves very well, and were able to collect and transmit all the necessary information.

The on-site inspections (OSI) regime is another important issue. Under the terms of the CTBT, on-site inspections are a measure of last resort that can be used to make a definitive conclusion as to whether a CTBT state party is in breach of its obligation to desist from nuclear tests.

It is quite telling that the OSI component is lagging behind all the other elements of the CTBT verification mechanism. It was always understood that OSIs are a measure of last resort, and that conducting such inspections would only become possible after the treaty's entry into force. Another reason for the delay with implementing the OSI system is that the eight countries from the List of 44 who have not yet ratified the treaty have sent clear signals that they are not ready to ratify.

Meanwhile, the United States has clearly done all it could to speed up the deployment of the IMS and IDC components, which has led to a major increase in the detection sensitivity of the sonar and radionuclide stations. That increase cannot be justified by the needs of the Treaty, and it probably pursued completely unrelated goals. Unfortunately, this is a clear case of politicization that is so often a part of verification procedures. In this context, there have been many raised eyebrows about the attempts to use the CTBT verification mechanism, which is not yet fully ready, for verifying the closure of the North Korean nuclear test sites.

As for the on-site inspections, the second large-scale OSI exercise held in Jordan in 2014 proved an excellent practical demonstration of that instrument's potential. The lessons learnt from these exercises should be used more fully in the OSI operational procedures. The CTBTO PC verification workgroup should also focus on developing verification solutions for different environments because, after all, the CTBT mandates a comprehensive ban on nuclear tests.

To summarize, the CTBT verification mechanism is very complex and requires specific expertise. It is important that the mechanism was designed to serve the specific purposes and tasks of the CTBT, and its use for other purposes would be counterproductive.

International Partnership for Nuclear Disarmament Verification (IPNDV). This initiative aims to develop various solutions and options for verification activities, designed as modules that can be assembled into a working verification mechanism for any specific disarmament agreement.

The organizational setup of this initiative, which consists of three working groups, appears well-suited to the task at hand. Such a setup has enabled the working groups to discuss many different

The IPNDV can well be regarded as an umbrella organization for sharing ideas and proposals with other outfits engaged in the same field of research

The non-nuclear weapon states and radical groups among the general public may be led to the wrong conclusion that such procedures are easy and entirely feasible, regardless of the strategic context and of the nuclear weapon states' willingness to pursue them

aspects of verification activities for all the key stages of the nuclear weapons lifecycle. The general approach is based on verification by an international inspection team of the disposal of a nuclear warhead (explosive device), including temporary storage of its components, by one state.

The initiative has produced a detailed description of all verification aspects, including the qualification requirements for inspectors and the persons who accompany them. It has also compiled a detailed "menu" of all currently available technical means and methods of monitoring and verification.

The updated IPNDV goals and objectives include developing a set of verification options for each individual phase of the nuclear warhead lifecycle, from decommissioning to the disposal of its internal components (a total of 14 different phases). The initiative has also developed ideas for command staff exercises and computer-based simulations.

The goal pursued by IPNDV organizers is quite obvious: they want to promote their ideas and solutions among the non-nuclear weapon states and the general public. Their contribution to the development of verification approaches is very valuable.

The IPNDV can well be regarded as an umbrella organization for sharing ideas and proposals with other outfits engaged in the same field of research – especially with the Group of Governmental Experts that explores the role of verification in promoting nuclear disarmament, as well as with the Partnership of Four, an initiative announced by the United States, Britain, Norway, and Sweden at the first session of the NPT PrepCom in 2017.

At the same time, some of the conclusions reached by the IPNDV raise questions. One of them is that there are no reasons (including national security or nonproliferation-related) why a multilateral verification of nuclear weapons dismantlement involving non-nuclear-weapon states should be impossible.

The level of detail and the scale of the IPNDV effort on verification procedures are impressive. The authors of these proposals probably believe that once an eventual verification mechanism has been developed, such a mechanism can, in and of itself, stimulate the nuclear disarmament process or serve as an instrument of political pressure in the NPT Review framework. But the proponents of this approach studiously ignore the strategic factors that could help to put in place the conditions required for the launch of a multilateral nuclear disarmament process. Also, the non-nuclear weapon states and radical groups among the general public may be led to the wrong conclusion that such procedures are easy and entirely feasible, regardless of the strategic context and of the nuclear weapon states' willingness to pursue them. ■

Russia is strongly committed to traditional legally binding instruments[20]

Sergey Ryabkov

RUSSIA'S VISION of arms control, disarmament and non-proliferation issues remains in fact very conventional. It is pragmatic and realistic. We do not feel "constrained by traditional formats and diplomatic protocol". On the contrary, we strongly believe that in many cases using proven formats and keeping to well-established diplomatic routine is the best way to address and resolve outstanding international issues of today and tomorrow. From our point of view, this "traditionalist" – or maybe "no-nonsense" – approach might be helpful for preventing turning serious and solution-oriented professional discussions aimed at achieving substantive results into road-shows with uncertain purpose, random participation and no clear mandate.

We also do not see advancing arms control, disarmament and non-proliferation as a self-sufficient goal. For us, it is first of all one of the means to assure Russia's national security – in this case, by using political and diplomatic tools. The Foreign Policy Concept of 2016 specially emphasizes this particular function of Russian diplomacy and gives it an undisputable "number one". So, we have a strong conviction that national security is – and should be – the main driving force behind this process.

By the way, this concept is also reflected in the NPT review process disarmament-related formulas: "in a way that promotes international stability, peace and undiminished and increased security" and "based on the principle of increased and undiminished security for all".

As a matter of fact, it would be completely unreasonable to expect any automation or self-sustained dynamics in areas, where progress depends on and is determined by evolving security environment. And evolutions that we currently see are anything but encouraging.

In the field of arms control, disarmament and nonproliferation Russia is strongly committed to traditional legally-binding instruments, that is to say international treaties and agreements. From our point of view, they have clear advantage over "Rules-based order" and over unilateral measures, informal understandings or even political commitments, though sometimes such commitments may also be useful.

First of all, legally-binding instruments result from negotiations during which parties directly express their concerns and formulate their wishes. This allows to address real issues without too much bias – at least in theory, for we have recently witnessed some quite different examples – and to reach a realistic balance between what is desired and what is achievable. This also provides opportunity to develop appropriate verification machinery and to agree on scope and modalities of eventual outreach. This aspect becomes particularly important today given – for example – growing aspirations of non-nuclear weapon States to monitor and verify the process of nuclear disarmament, that is to say reductions and limitations of nuclear weapons carried out by NWSs.

Verification is really one of the strongest points of legally-binding arrangements that no external oversight may substitute. Those familiar with our nuclear arms reduction treaties with the US know that they

are largely about verification. These treaties, surely, contain benchmark figures and dates as well as things like databases and glossaries of terms and definitions, but almost all the rest of their volume is dedicated to verification and transparency. By the way, problems that we currently have with New START Treaty implementation by the United States relate exactly to this particular area.

Unilateral measures do not even come close to these standards. For instance, a country may declare it has unilaterally reduced its nuclear missiles to a number of "X'. The first question is – how do we know it is true? And how the accuracy of such data may be checked? As a matter of fact, there is nothing to support such claims except "you have my word". Sounds great and sincere, but doubt may still exist, and there is no practical way to dissipate it.

Legally-binding instruments result from negotiations during which parties directly express their concerns and formulate their wishes. This provides an opportunity to develop appropriate verification machinery and to agree on the scope and modalities of eventual outreach

On the contrary, treaties like New START allow to track any particular missile or any particular launcher throughout its entire life-cycle and to have an accurate count of deployed nuclear warheads or other treaty-limited assets, even if sides may disagree on their actual numbers, as they do now. They may also contain mutually agreed guidelines and rules for eliminations or eventual conversions, so that one may be sure about the result of procedures applied. This is at least how it is supposed to work.

Legally-binding international instruments are also more difficult to cancel, even though treaties typically contain an "escape close" allowing each party to withdraw if it decides that extraordinary events related to the subject matter of the treaty have jeopardized its supreme interests. Fortunately, in the area of arms control using this clause is rather rare. Two major examples are the US withdrawals from ABM and INF treaties that we deeply regret. Such steps may bring freedom for realizing certain military programs and create an illusion of securing an advantage, but they inevitably produce very harmful consequences for international security and stability. At the US Marine Corps they say, that if something is done twice, it becomes a tradition. This gives me real concerns about the New START – the last nuclear arms control treaty involving the US that remains and that is getting nowadays strong criticism in Washington, DC. ■

FOOTNOTES

[1] A Reliable Shield (Commander of the Strategic Missile Forces and Deputy Defense Minister Yuri Maksimov answers questions about various aspects of the Soviet military doctrine) // Novoye Vremya. No 51, 1986. P.14

[2] The Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles // United Nations web site. http://www.un.org/ru/documents/decl_conv/conventions/pdf/treaty.pdf

[3] V.Z. Dvorkin. New treaty or extension of the New START // Nezavisimaya gazeta. August 23, 2016 http://www.ng.ru/armies/2016-08-23/3_kartblansh.html (last accessed February 20, 2020)

[4] Statement by the Russian Foreign Ministry. February 5, 2018 // Russian MFA web site http://www.mid.ru/ru/press_service/spokesman/official_ statement/- /asset_publisher/t2GCdmD8RNIr/content/id/ 3054864 (last accessed February 20, 2020)

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[9] The Pentagon fails to respond to Shougu's call. December 15, 2018. // RIA Novosti https://ria.ru/20181215/1548036508.html (last accessed February 22, 2020).

[10] For more information in the compliance verification system of the START I treaty, see: Arms Control and Military Activity Control: Reference Materials (in Russian). Moscow: PIR Center, 2001. P. 25-31

[11] For a detailed analysis of the New START compliance verification system, see: A.I. Antonov. Arms Control: History, Current State, and Prospects (in Russian). Moscow: ROSSPEN, PIR Center, 2012, P. 26-30

[12] Lars van Dassen is Director for the Office for International Relations at the Swedish Radiation Safety Authority, SSM. He has been in charge of Sweden's international cooperation programmes with states in Eastern Europe since 2001 and in this capacity been involved in many projects with Russian partners as well as with partners in other parts of Eastern Europe and third countries. The interpretations and issues expressed are his own and do not necessarily reflect those of Swedish authorities and the multilateral verification institutions mentioned, in which he has participated since 2015.

[13] See for instance Eric Schloesser. Command and Control. Penguin Press, 2013 which is the best recent account. See also Andreas Persbo. Verification and Nuclear Disarmament. Nik Hynek, Michal Smetana. Global Nuclear Disarmament: Strategic, Political and Regional Perspectives. Routledge, London. 2016, pp. 75-93. However, James Wirtz.Nuclear politics: The political decision to acquire, sustain or discard a nuclear arsenal / Robert Rauchhaus, Matthew Koenig and Eric Gartzke, Causes and Consequences of Nuclear Proliferation. Routledge, London, 2011, pp. 138-154 – offer a sobering account where it is argued that risks for accidents increase the less a technology is being given attention. If a nuclear weapons sector is in demise and under abolishment, the more do the risks increase due to shrinking resources, reduced upkeep and maintenance and the lower ability of the sector to attract new cadres of experts.

[14] See: Bruce G. Blair Why Our Nuclear Weapons Can Be Hacked // New York Times, 14 March 2017; Andrew Futter, Hacking the Bomb: Cyber Threats and Nuclear Weapons. GUP, Washington, 2018; Stephen D. Bryen. Enabling China's Weapons Hacking. Jewish Policy Center, Winter 2019; Andrew Futter. Hacking the Bomb: Cyber Threats and Nuclear Weapons. GUP, Washington, 2018.

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[19] This refers to GGE work in 2014-2015 (UN GA Resolution 67/53, Final Report A /70/81) and GGE work in 2017-2017 (UNGA Resolution 71/259)

[20] Part of the presentation by the Deputy Foreign Minister of the Russian Federation Sergey Ryabkov at a meeting with the students of the dual-degree Master Program in Nonproliferation Studies, carried out jointly by MGIMO University, PIR Center, and Middlebury Institute of International Studies at Monterey. December 10, 2019.

ACRONYMS

ABM: Anti-Ballistic Missile Defense

CAFEC: Conventional Armed Forces in Europe Control

CFE Treaty: Conventional Forces in Europe Treaty

CTBT: Comprehensive Nuclear Test Ban Treaty

FMCT: Fissile Material Cut-off Treaty

GGE: Group of Governmental Experts

GSC: Global Satellite Communications

HB: Heavy Bomber

IAEA: International Atomic Energy Agency

ICBM: Intercontinental Ballistic Missile

IMS: International Monitoring System

INF Treaty: The Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles

New START: The Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms

NPT: Nuclear Nonproliferation Treaty

NSG: Nuclear Supplies Group

OSI: On-Site Inspections

SALT I: Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms

SALT II: Treaty Between the United States of America and The Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms

SLBM: Submarine-Launched Ballistic Missile

SMF: Strategic Missile Forces

SOA: Strategic Offensive Arms

START I: Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms

START II: Treaty Between the United States of America and the Russian Federation on Further Reduction and Limitation of Strategic Offensive Arms

SECURITY INDEX

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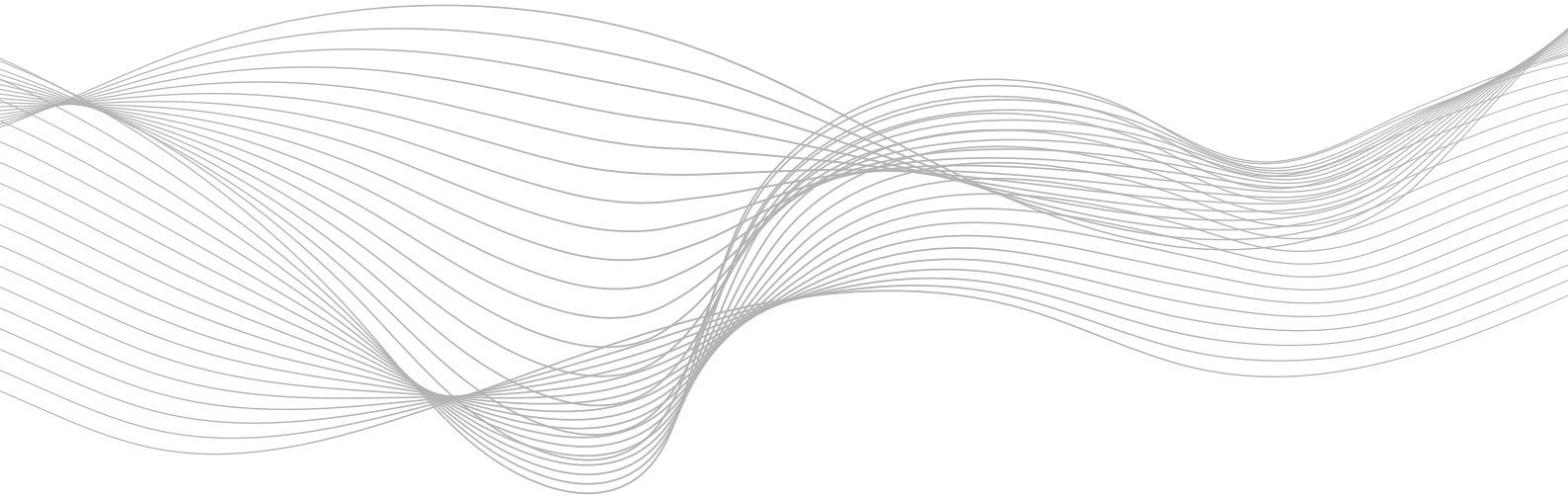

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